WARRNAMBOOL
CITY COUNCIL

Warrnambool Principal Pedestrian Network Report

1.
INTRODUCTION

The first chapter of this report outlines an overview of the project and identifies the project objectives and study area.

1.1 OVERVIEW

Walking is one of the most beneficial modes of transportation. Walking in this document is defined as travel on foot or with a mobility aid. A form of active transport, walking offers a broad range of health, environmental, economic and social benefits. Best suited for shorter trips, many people walk to local destinations such as shops, cafés, parks or schools. Many public transport journeys include walking to a bus stop or train station and then walking to the final destination.

Warrnambool City Council is working with the local community to become less reliant on private motor vehicle transport and shifting towards utilising more modes of active transport. This is highlighted in the 'Vision of the City, Sustainable Transport Strategy'.

The Strategy encourages safe, well connected and environmentally responsible travel throughout the city.

One of the key objectives identified in Warrnambool's Sustainable Transport Strategy is to strengthen the pedestrian network by identifying missing gaps in paths and pedestrian infrastructure. To encourage more walking trips within the municipality, it is imperative that walking links are safe, convenient and attractive, and that guidance for walkers is clear. Acknowledging the importance of walking Warrnambool City Council wishes to build on the work of the Strategy by developing a Principal Pedestrian Network (PPN) across the city to facilitate increased rates of walking, particularly as a mode of transport.

The PPN will be used by Council to prioritise its future investigations and infrastructure upgrades to those links that are key connections across the municipality.

1.2 PROJECT OBJECTIVES

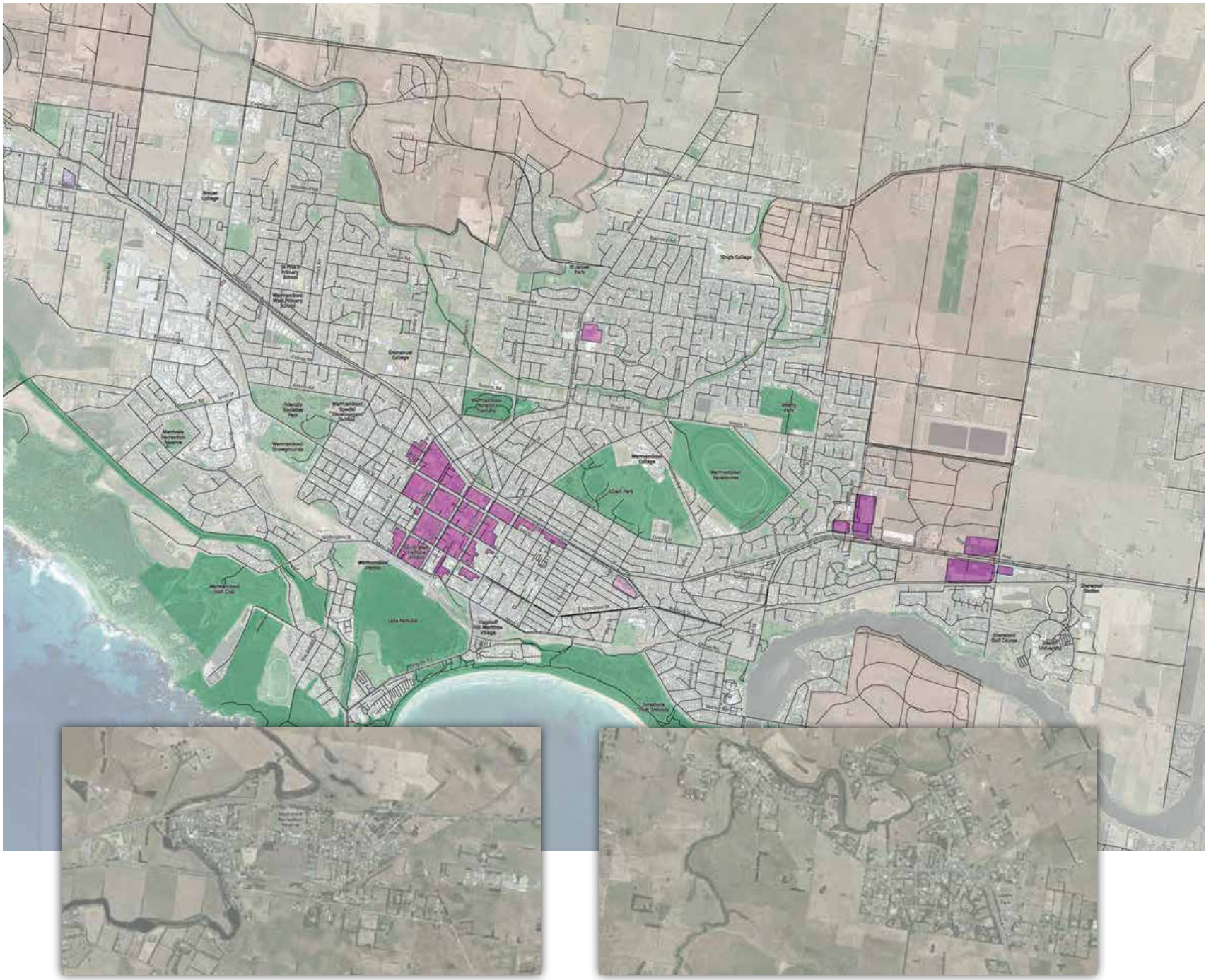
The overarching objective of developing a PPN is to increase the amount of local trips undertaken on foot or with a mobility aid.

This can be achieved by making the shortest walking route the highest quality route. The development and implementation of the PPN also aims to:

- Promote forms of transport with the lowest impact on the environment, health and well-being,
- Reduce the use of private motor vehicles transport for short, local trips, and
- Facilitate better access to, and greater mobility within local communities.

1.3 STUDY AREA

The project focuses on delineating a PPN across the Warrnambool City Council municipality, including the townships of Allansford and Woodford.



1.4 WHAT IS A PRINCIPAL PEDESTRIAN NETWORK?

A Principal Pedestrian Network (PPN) is a strategic network of pedestrian routes to promote walking for transport. A walking route within the PPN will provide the highest level of service for pedestrians.

Characteristics such as generous footpaths, shade and weather protection, seating and priority over other transport modes at intersections are all ways of providing a comfortable and enjoyable walking environment.

The State Government approved methodology has been used to guide this project. The PPN will provide Warrnambool City Council with a tool to develop a framework and evidence base for the inclusion of pedestrian needs in transport and planning by:

- Mapping pedestrian movements in the municipality and identifying priority routes; and,
- Planning for and prioritising infrastructure improvement to encourage and support increased levels of walking.

The PPN will identify pedestrian routes that have the potential to connect a higher number of people to key destinations. Once key routes are identified, Warrnambool Council will have the ability to prioritise and plan for capital works improvements to the areas that are subject to high levels of pedestrian traffic. The implementation plan assists in the delivery of safe and accessible pedestrian facilities for the local community, and ultimately supports Council's vision to provide high quality, safe and accessible pedestrian facilities across the municipality.

Figure 1 - An existing pedestrian route (Source: PPN Guidelines)

Figure 2 - A Principal Pedestrian Route (Source: PPN Guidelines)

2. STRATEGIC CONTEXT

The chapter summarises the key strategic work that has been undertaken by Warrnambool City Council that supports the development of the Principal Pedestrian Network.

2.1 EXISTING STRATEGIES & REPORTS

2.1.1 WARRNAMBOOL - A HEALTHY CITY, 2021 - 2025

The Warrnambool Health and Wellbeing Plan provides guidance on strategies to improve the health and well being of the Warrnambool community.

The Plan supports improvements in local health and well being through policy, community partnerships, cultural change and creating safe, convenient, inclusive and accessible places which encourage physical activity. The Plan outlines the priority issues to be addressed including supporting healthy lifestyles and increasing active living.
Development of a PPN will support the objectives of Warrnambool, A Healthy City by:

- Identifying key pedestrian routes to enable Council to prioritise the delivery of paths and supporting infrastructure on these key walking routes. This will increase the amount of people likely to walk to work, school, the local shops and parks, as well as walking for recreation.
- Providing a tool for promotion of active transport
- Supporting the most equitable mode of transport that has the greatest benefit for community health and well being.

2.1.2 WARRNAMBOOL SUSTAINABLE TRANSPORT STRATEGY, 2010 - 2020

Warrnambool City Council is working with the local community to be a city that is less reliant on private motor vehicles and more reliant on active transport modes.

There are numerous benefits to increasing a community's use of sustainable transport, including improved health, financial and environmental outcomes for individuals and society more broadly.

Consultation conducted as part of the development of the Strategy indicated that members of the Warrnambool community would utilise sustainable transport modes more frequently if improvements were made to the existing infrastructure to enhance quality, connectedness and safety.

The Development of a PPN will support the objectives of this Strategy by:

- Addressing gaps in the footpath and shared path system,
- Identifying missing pedestrian infrastructure and amenities,
- Improving connectivity between key destinations,mapping verification & validation, and;
- Raising awareness of the benefits of walking and promotion of the walking network and infrastructure.

2.1.3 WARRNAMBOOL OPEN SPACE STRATEGY - 2014

Warrnambool has a large network of parks and reserves that are key attractions for locals and visitors. They play a significant role in contributing to

Warrnambool's coastal character and outdoor lifestyle. The purpose of the Warrnambool Open Space Strategy is to provide an overarching framework to direct open space planning and management to 2026, ensuring the network is preserved and enhanced for current and future residents.

The overarching vision for open space in Warrnambool is having a high quality, diverse, accessible open space network that reflects community needs and enhances social connection, environmental protection and economic benefit. It is intended that Warrnambool's open space network will be: accessible, adaptable, connected, efficient, diverse, equitable, sustainable and protective of the environment.

The most significant issue at the municipal level appears to be the connectivity between open spaces, including along some waterways.

The Development of a PPN will support the objectives of this Strategy by:

- Improving connectivity issues between homes and parks, reserves and waterways, and
- Contributing to the activation of open space by making the journey to the local park easy, safe and enjoyable.

2.1.4 WARRNAMBOOL CITY WIDE HOUSING STRATEGY, 2013

Warrnambool is forecast to grow at 1.4% per annum over the next 20 years. By 2031, the City is expected to be home to over 43,000 people. Based on forecast growth and household sizes, 225 new dwellings need to be constructed per year to meet demand, and most of these dwellings are projected to be constructed within growth areas. The combination of growth areas and infill opportunities will enhance the diversity of housing choices available to new and existing residents.

The significant growth anticipated for Warrnambool will require adequate levels of infrastructure and social services and will result in additional demand for water, energy, transport and utility infrastructure.

The Development of a PPN will support the objectives of this Strategy by:

- Planning for the transport needs of future communities, by ensuring that walking is integrated into the transport network, and
- Assisting Council with prioritisng for future pedestrian infrastructure.

2.1.5. GREEN WARRNAMBOOL PLAN, 2018

The vision for Green Warrnambool is for Warrnambool to be the most environmentally sustainable regional city in Australia.
The Plan aims to have zero net greenhouse gas emissions and aims for Warrnambool to be an active and sustainable transport leader in Australia.
The Plan advocates increased use of walking and bicycle paths and identifies the PPN as an action to deliver this outcome.

2.1.6 ACTIVE WARRNAMBOOL STRATEGY, 2019-2030

The purpose of the Strategy is to increase regular participation in sport, active recreation and physical activity by everyone in the community, in order to take advantage of the benefits of sport and recreation such as physical fitness, reduced risk of chronic illnesses and improved mental health.

The Warrnambool 2040 Community Survey found walking continues to be the most popular physical activity for local residents.

Review of the current facility provision and sports participation revealed a need for planning and investment in paths and trails to support continued high levels of participation in walking.

3. DEVELOPING THE PPN

This chapter outlines the key steps taken in developing the Warrnambool PPN. It is structured according to these key stages:

1. Developing the Pedestrain Network
2. Identifying the Residential Origin Points
3. Identifying the Key Destinations within the Study Area
4. Map the Shortest Route Analysis
5. Delinating the Draft PPN

3.1 THE MAPPING METHODOLOGY

3.1.1 KEY STEPS

There were seven key stages undertaken in the development of the Warrnambool PPN.

These seven stages were:

- Stage 1 - Defining the pedestrian network
- Stage 2 - Identifing the residential origins
- Stage 3 - Identifying the primary destinations
- Stage 4 - Undertaking the Shortest Route Analysis between the identified residential origins and key destinations
- Stage 5 - Combine and weight the shortest routes-mapping in order to delinate the Draft PPN.
- Stage 6 - Verification of the modelling and data
- Stage 7 - Delineation of the Draft PPN

This chapter outlines the preliminary stages of analysis, the pedestrian access mapping in stages 1 -5.

3.1.2 LIMITATIONS OF THE PEDESTRIAN ACCESS MAPPING

SHORTEST ROUTE ANALYSIS

A key focus for the PPN is to encourage a shift from transport trips that would typically be undertaken in a car to walking, i.e. travelling to the train station, to the shops or school.

In order to do this, the PPN needs to focus on the shortest possible route so that travelling from origins to destinations is as quick and as comfortable as possible. Once this route is identified, the highest level of service is provided to make walking an attractive, safe and logical option.

The pedestrian access mapping analysis therefore determines the shortest route between origins and destinations - it does not determine the most desirable or scenic route.

In addition, the mapping analysis identifies the shortest route to destination points i.e. park entry points, shopping strip entry points. It does not identify recreational routes i.e. walking along shopping strips or walking through a park.

MULTIPLE-TRIPS

The analysis only determines the shortest routes to the nearest destination. As a result, the mapping does not account for multi-destination origins i.e. from home (origin) to retail shops and then to school (destinations).

3.2 STEP 1 - DEFINE THE PEDESTRIAN NETWORK

The first step in pedestrian analysis mapping is to define the pedestrian network. An existing street network was used as the basis and this was updated to more accurately reflect pedestrian access. This involved ensuring that all streets with footpaths, off-street trails and pedestrian crossings over major roads that can be accessed by foot were included.

3.3 STEP 2 - IDENTIFY THE RESIDENTIAL ORIGINS

The second step in the pedestrian analysis is to create residential origin points and household population values for each residential address within the study area. 2016 Census Mesh Block data was used as the basis for assigning a population value to each residential address. Mesh blocks are the smallest geographic region in the Australian Statistical Geography Standard and contain information about how many people live within a small geographical area. A population value was apportioned to each household based on the mesh block.

Legend

Existing Pedestrian Network

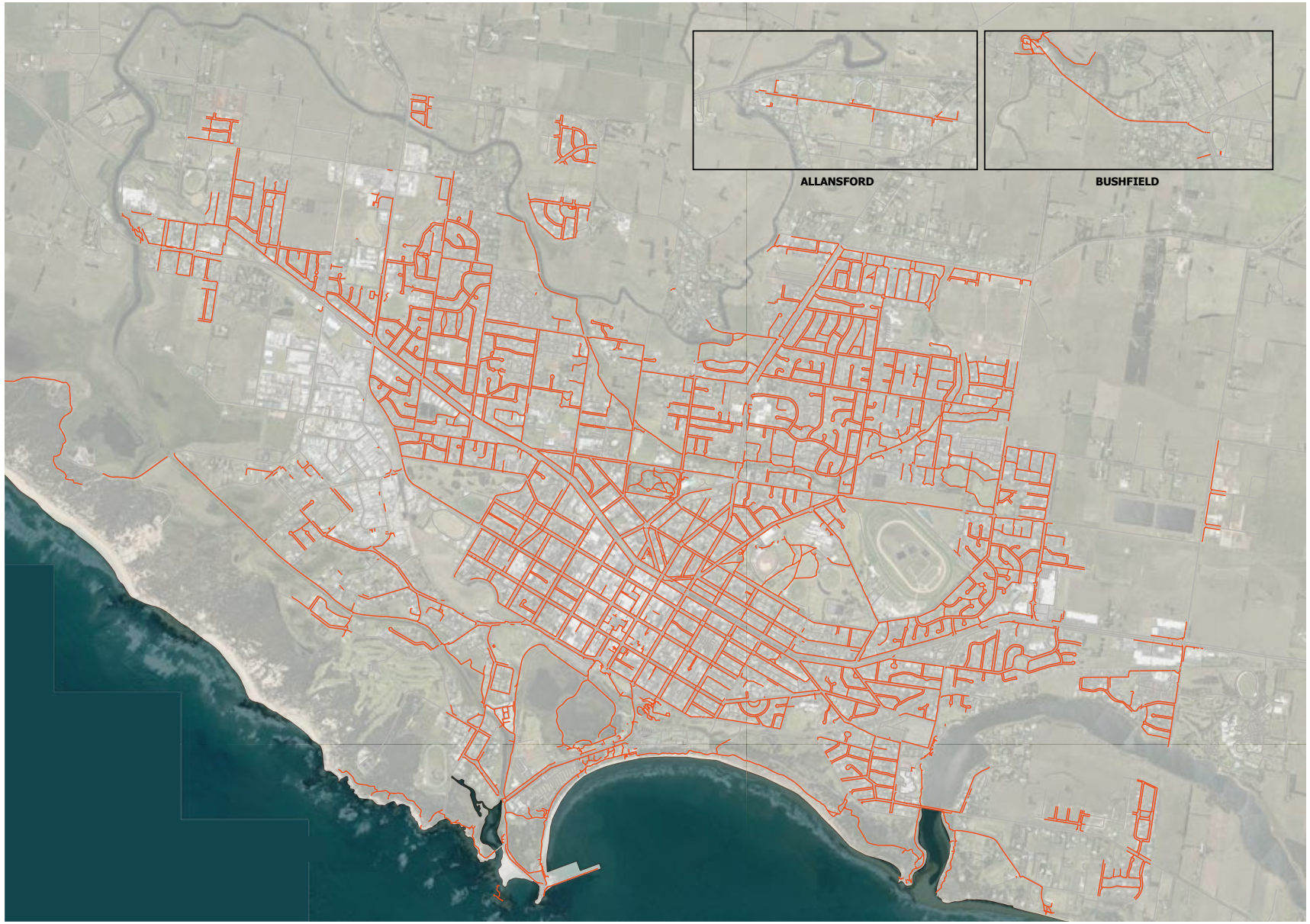


Figure 3 - Pedestrian Network Map

Legend

Study Area

Residential Origins

Figure 4 - Residential Origins Plan

3.4 STEP 3 - IDENTIFY THE KEY DESTINATIONS

Key destinations were delineated across the study area under the following categories;

- Train Stations
- Bus Stops
- Retail (Major)
- Retail (Minor)
- Kindergartens
- Primary Schools
- Secondary Schools
- Tertiary Institutions
- Childcare facilities
- Community Facilities
- Health Facilities
- Major Open Space
- All Open Space
- Major Employment.

A walking catchment was determined for each destination category reflecting the maximum distance people are likely to walk to access the destination.

These walking catchments are identified in the discussion of each of the shortest route maps.

3.5 STEP 4 - THE SHORTEST ROUTE ANALYSIS

Shortest route analysis of potential pedestrian trips between residential origins and key destinations was undertaken for the City of Warrnmbool. This analysis models the potential trips that will be undertaken between residential origin points (houses) and the nearest identified key destination, such as a bus stop or school.

The total potential trips are calculated to the 14 destinations listed below, and combined into a plan that shows the total potential pedestrian trip accross all each destinations.

A walkable catchment was identified for each of the primary destination categories. This reflects the likely distance a user would walk to a specific destination.

The catchment applied to the destination categories were:

- Train Stations - 1km
- Bus Stops - 400m
- Retail (Major) - 1km
- Retail (Minor) - 1km
- Kindergartens - 1km
- Primary Schools - 1km
- Secondary Schools - 1km
- Tertiary Institutions - 1.5km
- Childcare facilities - 1km
- Community Facilities - 1km
- Health Facilities - 1km
- Major Open Space - 1km
- All Open Space - 1km
- Major Employment - 1km

The following pages outline the results of the shortest route mapping for each destination category.

3.5.1 ACCESS TO TRAIN STATION

There is one train line and two train stations, Warrnambool Station is located in the CBD and Sherwood Train Station is located to the north of Deakin University, servicing Warrnambool. A 1km walking catchment was applied when assessing the shortest routes for the two train stations. Whilst a 1km catchment was applied walking is not limited to this catchment because in some cases people may be prepared to walk further to reach the train service.

The results show a concentration of potential walking trips radiating out from both train stations, however there are much larger volumes of potential pedestrians using Warrnambool Station. Being the more centrally located station this is not surprising, most people would be required to drive to Sherwood Station because of its relative distance from town and housing.

Potential Pedestrian Trips to Train Stations

350 or greater
300 - 350
250 - 300
150 - 200
100 - 150
50 - 100
1 - 50

Figure 5 - Potential Walking Trips to Train Stations

3.5.2 ACCESS TO BUS STOPS

A walking catchment of 400m from all bus stops in Warrnambool was analysed. This distance is based on the acknowledged standard that residents are less likely to walk beyond 400m to access bus stops. 400m equates to a average 5 minute walk for most people.

Given the even coverage of bus stops across the municipality, pedestrian access appears to be evenly dispersed across the pedestrian network. There is one bus stop located in Allansford and no bus services in in Woodford.

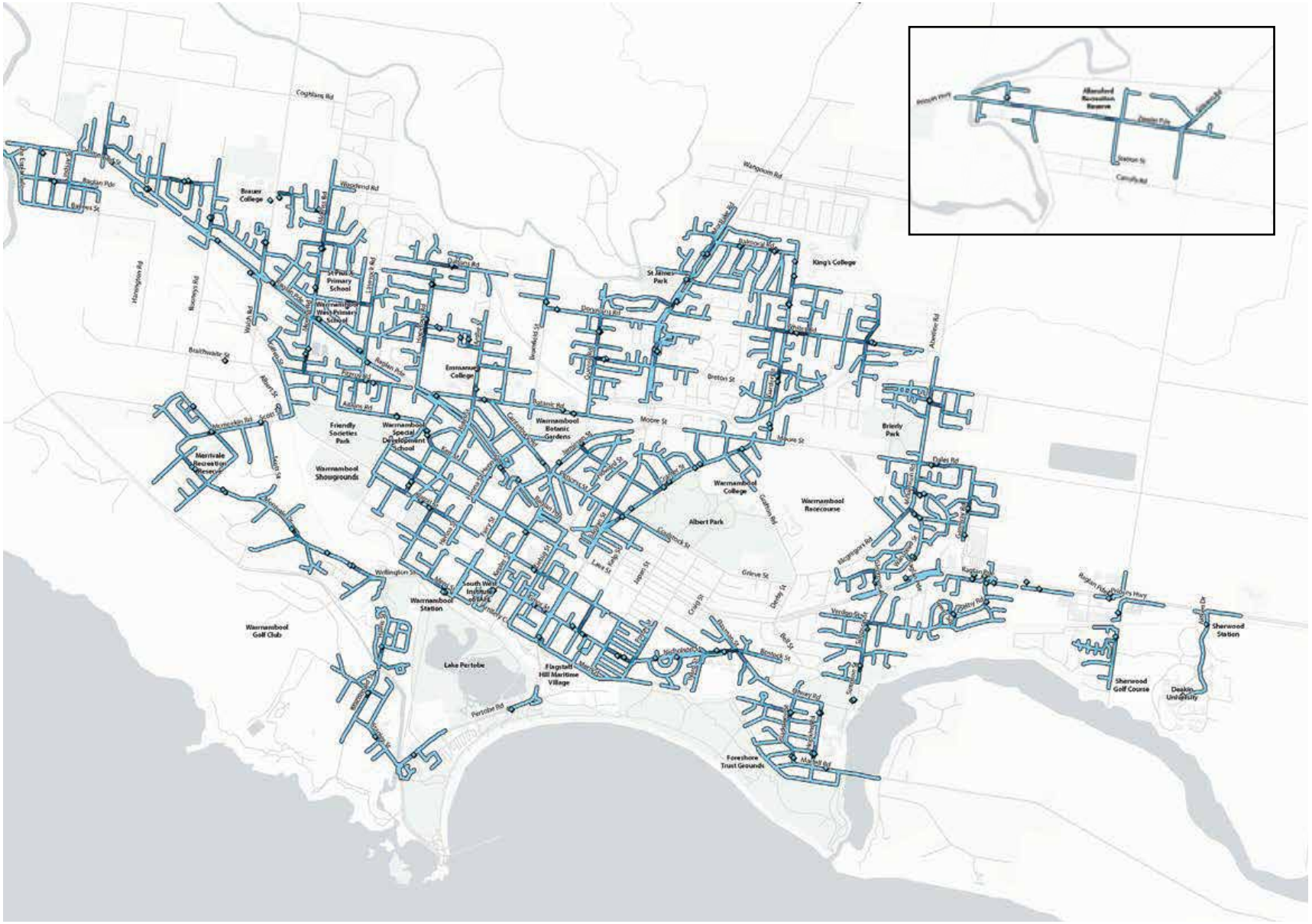


Figure 6 - Potential Walking Trips to Bus Stops

3.5.3 ACCESS TO MAJOR RETAIL AREAS

There are four major retail centres in Warrnambool. The CBD is the largest, followed by Gateway Plaza, Northpoint and the large formal retail centre located on the Princes Highway. A walking catchment of 1km from major retail centres was analysed. The results clearly reveal the potential walking routes to the CBD, Gateway Plaza and Northpoint radiate out from the retail centre along all major roads. The amount of pedestrian activity potentially occurring at the retail centre located out of town is low, possibly due to its location and the type of retail shopping provided.

Figure 7 - Potential Walking Trips to Major Retail Areas

3.5.4 ACCESS TO ALL RETAIL AREAS

In addition to the four major retail centres, there are a number of smaller retail offerings throughout Warrnambool, and one convenience store in Allansford.

A walking catchment of 1km from all retail centres was analysed. In line with the results of the major retail centres, potential walking routes to all centres radiate out from the centre along major and local roads demonstrating that the smaller centres are attractive destinations per pedestrians.

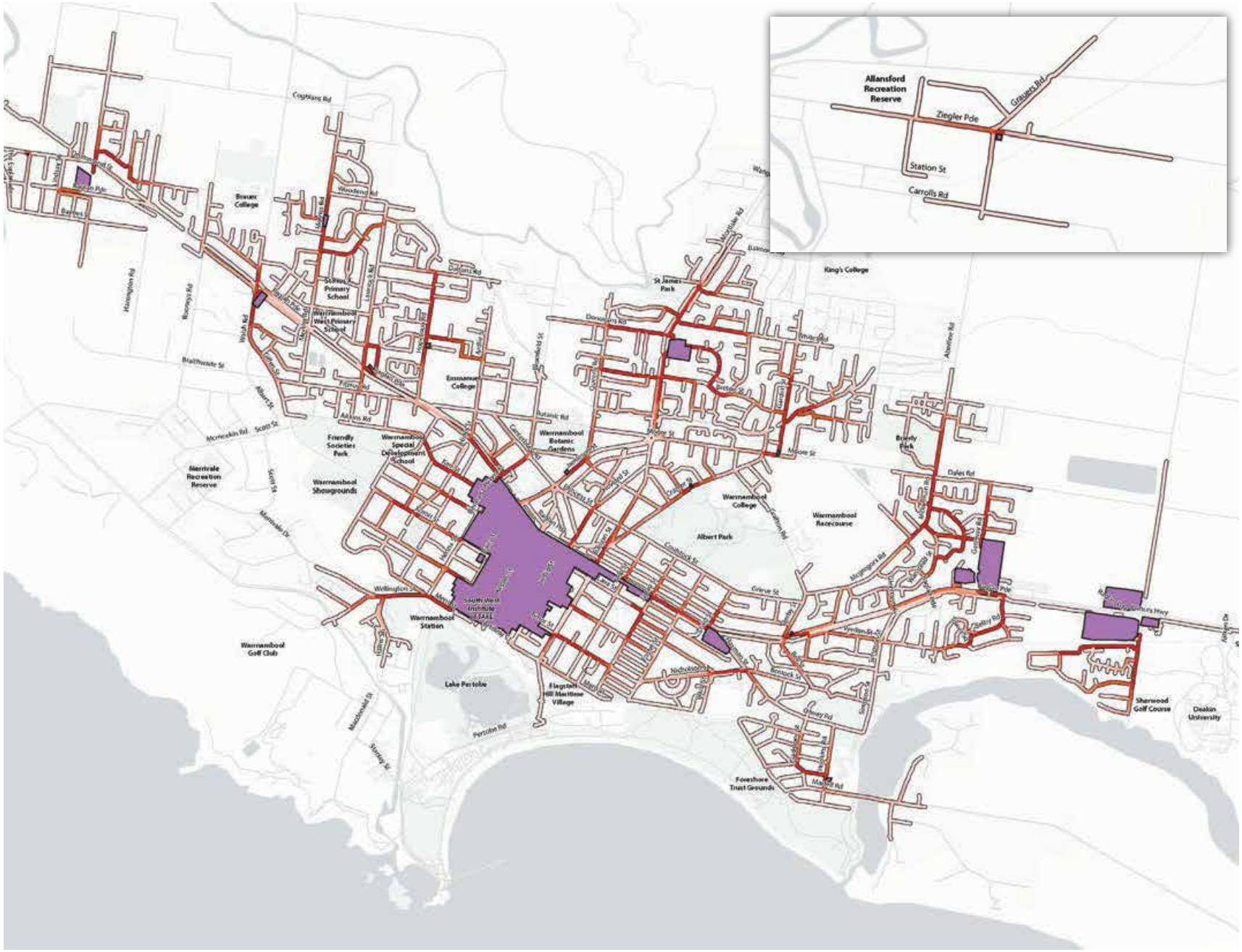


Figure 8 - Potential Walking Trips to All Retail Areas

3.5.5 ACCESS TO COMMUNITY FACILITIES

There are 53 community facilities located throughout Warnambool. Both Allansford and Woodford have community facilities. Whilst there is an even distribution throughout the municipality, there is a higher concentration in the CBD.

Potential pedestrian trips to the community centres is low in comparison to retail centres, however the mapping reveals even access across the municipality.

The facilities with the lowest pedestrian access are the two that are located south of the CBD, close to the waterfront.

Figure 9 - Potential Walking Trips to Community Facilities

3.5.6 ACCESS TO HEALTH FACILITIES

South West Healthcare and St John of God are the two major hospitals located in Warrnambool. A walking catchment of 1km from the two hospitals was analysed. The results of the shortest route analysis reveal a clear walking catchment around the hospitals, which potentially reflects the potential for local employees to walk to work.

Potential Pedestrian Trips to Hospitals

- 350 or greater
- 300 - 350
- 250 - 300
- 200 - 250
- 150 - 200
- 100 - 150
- 50 - 100
- 1 - 50

Figure 10 - Potential Walking Trips to Major Hospitals

3.5.7 ACCESS TO CHILD CARE FACILITIES

There are ten child care facilities operating throughout Warrnambool, the majority of which are located along the central spine being the Princes Highway and Raglan Parade.
A walking catchment of 1km was used in the analysis and the results reveal an even distribution of potentially high pedestrian activity occurring along the major roads radiating out from each facility.

Figure 11 - Potential Walking Trips to Child Care Facilities

3.5.8 ACCESS TO KINDERGARTENS

Analysing the 1km walking catchment the results of the shortest route analysis reveal, like access to child care, low potential walking activity to and from kindergartens.
The kindergarten in Allansford, is located close to the Recreation Reserve on Ziegler Parade. The modelling reveals the potential for pedestrian trips from home to the kindergarten.

Potential Pedestrian Trips to Kindergartens

200 or greater
150 - 200
100 - 150
50 - 100
1 - 50

Figure 12 - Potential Walking Trips to Kindergartens

3.5.9 ACCESS TO PRIMARY SCHOOLS

A walking catchment of 1km was used for the 18 primary schools located within Warrnambool. Interestingly the majority of primary schools are located to the north of Princes Highway/Raglan Parade. With the exception of Warrnambool East Primary School and Our Lady Help of Christians Primary School, no school are located in Warrnambool south. There is a primary school located in both Allansford and Woodford.

The results reveals a lot more pedestrian activity when compared to pedestrian access levels to kindergartens.
There are greater levels of access along more streets reflecting the likelihood of school age children walking to school with their parents.

Figure 13 - Potential Walking Trips to Primary Schools

3.5.10 ACCESS TO SECONDARY SCHOOLS

Like primary schools, a walking catchment of 1km was applied to the 5 secondary schools located within Warrnambool. In comparison to primary schools, there are significant gaps in the secondary school network, with no secondary schools being located in the south and south east.

The analysis reveals high amounts of pedestrian activity along major roads. This is influenced by the older student population being able to walk to school unsupervised, as well as the school bus routes (where students may take the bus part way and walk part way).

Figure 14 - Potential Walking Trips to Secondary Schools

3.5.11 ACCESS TO TERTIARY EDUCATION

A walking catchment of 1.5km was used for the two tertiary institutions located in Warrnambool. There is a major difference in the locations of the institutions, making them difficult to compare. South West Tafe is located in the CBD and as a result the potential for pedestrian access is high, whilst the Deakin University Warrnambool campus is located out of town,to the south east of Warrnambool. The student catchment for the university is wide so the majority of students would be required to own a car, and typically drive to uni. Pedestrian access throughout the campus is important, as is connections to local shops and facilities.

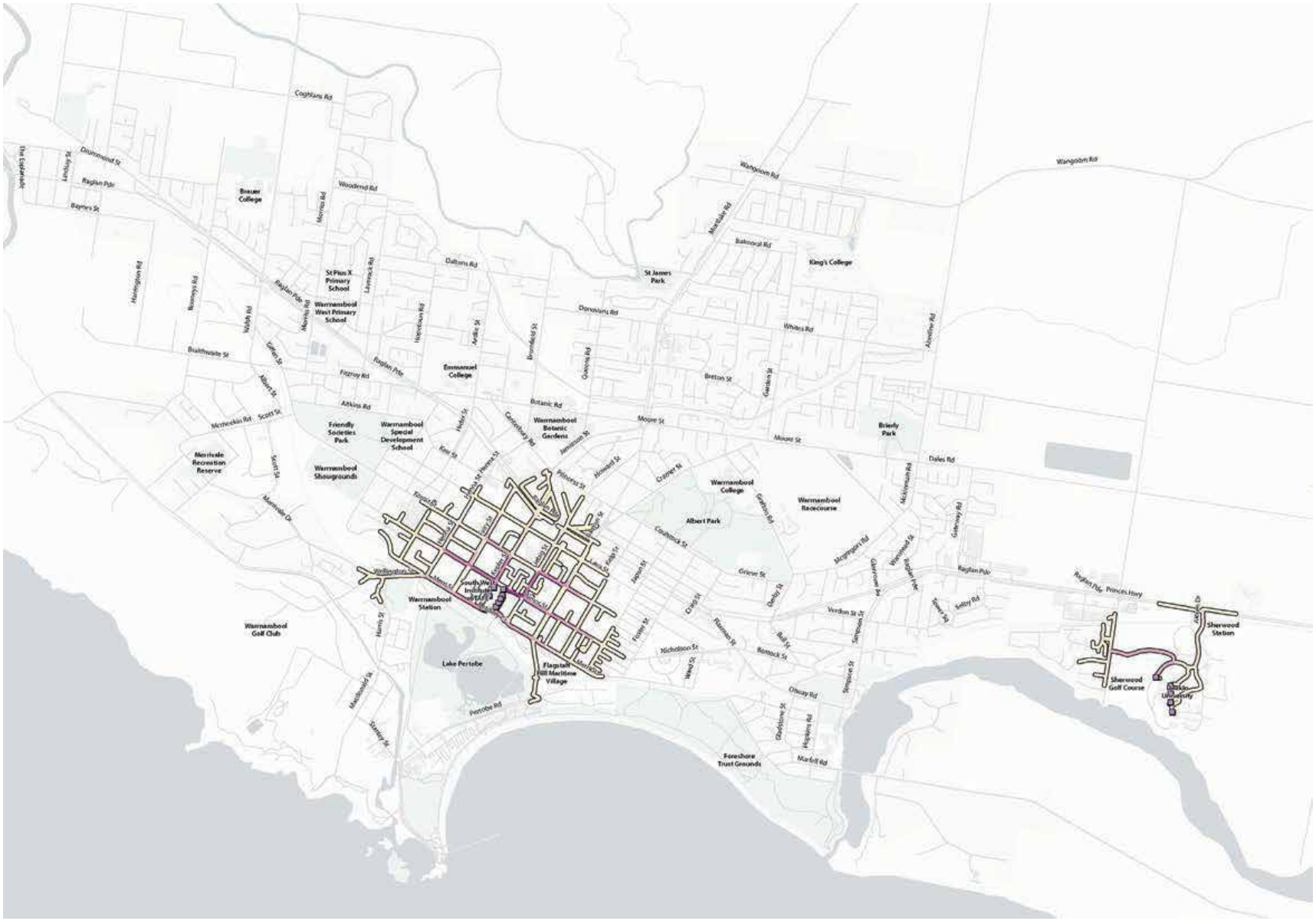


Figure 15 - Potential Walking Trips to Tertiary Institutions

3.5.12 ACCESS TO MAJOR EMPLOYMENT

In addition to the CBD, six major employers were identified as key destinations in the pedestrian network. These destinations were included to ensure that potential pedestrian activity, travelling to and from work, is considered. This was particularly important for the industrial area located on McMeekin Road, and although there is a bus route running along McMeeking Road there are no other key destinations in close proximity. As a results the modelling reveals the potential for high pedestrian activity along the key roads leading into this area. We also see the potential for high levels of walking to and from Wannon Water (close to the Gateway Shopping Centre) in Warrnambool east.

Figure 16 - Potential Walking Trips to Major Employment Destinations

3.5.13 ACCESS TO MAJOR OPEN SPACE

Major open space was separated out for analysis to reflect their importance as a key destination. The larger parks and reserves in Warrnambool are primarily located to the south, along the foreshore. Given the close proximity to the CBD and the existing trails some of the parkland is easily accessible by foot and the modelling results reflect this.

Potential Pedestrian Trips to Major Open Space

- 200 or greater
- 150 - 200
- 125 - 150
- 100 - 125
- 75 - 100
- 50 - 75
- 25 - 50
- 1 - 25

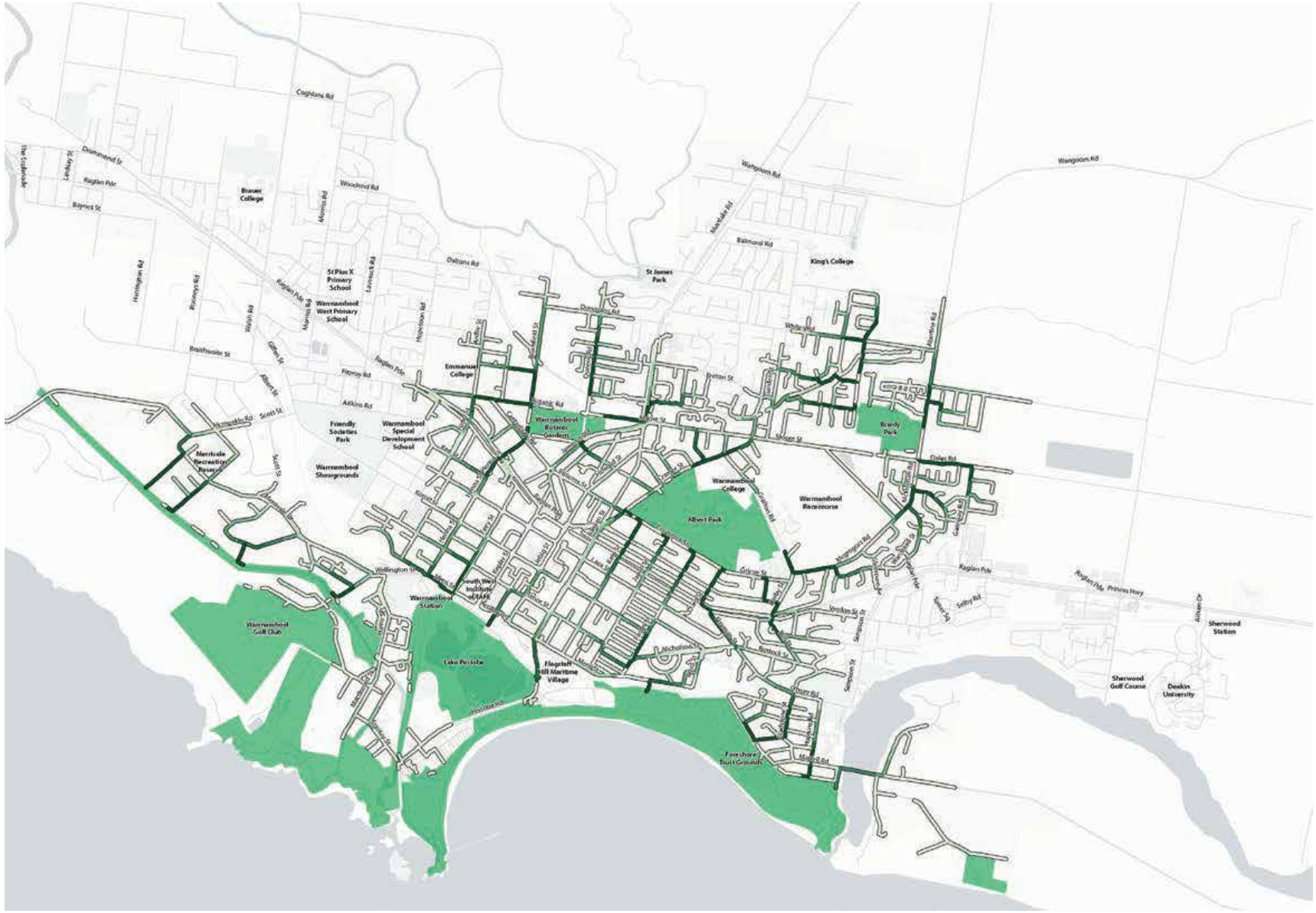


Figure 17 - Potential Walking Trips to Major Open Space Destinations

3.5.14 ACCESS TO ALL OPEN SPACE FACILITIES

Open space includes parks and reserves in Warrnambool. The plan reveals there is an even spread of open space facilities throughout Warrnambool with the exception of the CBD. The modelling reveals the potential for trips to local open space facilities is as likely as to major parks.

Potential Pedestrian Trips to Open Space

200 or greater
150 - 200
100 - 150
50 - 100
1 - 50

Figure 18 - Potential Walking Trips to Open Space Destinations

3.5.15 ACCESS TO ALL DESTINATIONS

To reveal the level of pedestrian accessibility within Warrnambool, the shortest route analysis for the 14 destination types was combined into one map (see Figure 19 opposite).
A weighting to each of the destination types was applied to reflect the relative proportion of residents likely to travel to each destination type.

The weighting applied to the destination categories were:

- Train Stations - 100%
- Bus Stops - 33%
- Retail (Major) - 100%
- Retail (All) - 66%
- Primary Schools - 33%
- Secondary Schools - 33%
- Tertiary Institutions - 66%
- Kindergartens - 33%
- Childcare Facilities
- Community Facilities - 33%
- Health Facilities - 16.5%
- Major Employment - 66%

This map reveals where potential trips made by Warrnambool's residential population are likely to be the highest. A Draft Principal Pedestrian Network is created from the shortest route analysis which delineates the routes likely to carry the greatest amount of pedestrian trips.

Figure 19 - Shortest Route Analysis

4. MAPPING VALIDATION & VERIFICATION

4.1 PEDESTRIAN COUNTS

Pedestrian counts are an important part of the verification process of the shortest route analysis. The primary goal of undertaking pedestrian counts is to validate the results of the shortest route analysis as outlined in the state government guidelines for developing principal pedestrian networks. Counts are undertaken primarily to compare the shortest route mapping with actual usage of Warrnambool's pedestrian routes.

Counts were undertaken at 23 key intersections across the municipality, however an emphasis was placed on intersections where it was considered that the predictions of the shortest route analysis may have been too high or low. These locations provided a broad sample across the geographic area of the municipality.

The data captured the direction in which pedestrians were travelling at each count location, enabling a fine-grain analysis of movement at key intersections. Pedestrian counts are usually undertaken mid week and during good weather conditions to ensure results are representative of a typical day. While this produces some insight to the movement of pedestrians along pedestrian count locations, additional counts across different days of the week would result in a more accurate understanding of pedestrian movement. The pedestrian counts for this project were undertaken on Wednesday 14th March, 2018, from 7am to 7pm.

4.1.1 PEDESTRIAN COUNT RESULTS

Figures 20 shows the locations where the pedestrian counts were undertaken and the count results, overlaid on the shortest route analysis. The arrows show the direction in which pedestrians were travelling, and are coloured according to the proportion of pedestrians recorded. Where the colours of the shortest route mapping are similar to those of the pedestrian counts, the results of the counts align with the prediction of the shortest route analysis.

The majority of pedestrian counts aligned with the shortest route analysis, however there were some areas of difference. The areas of difference were usually in areas of higher predicted pedestrian numbers than actual usage. This is often a result of site specific conditions along these routes not being pedestrian friendly. The results also reveal the further from the CBD, there is less pedestrian activity (with the exception of the activity recorded around the Gateway Plaza). People are more likely to drive for when further way from the CBD because the distances between key destinations are often greater.

Figure 20 - Comparison of Pedestrian Count Results and Combined Shortest Route Analysis

4.1.2 PEDESTRIAN COUNT FINDINGS

Inset 1 - Intersection of Langley Street and Caramut Road.

At the intersection of Langley Street and Caramut Roads lower pedestrian counts were recorded, than what the modelling predicted. This possibility reflects the two closet key destinations are a school and a recreation reserve, and that potentially locals tend to drive to these locations.

Inset 2 - Intersection of Hopetoun Road and Crawley Street

Low pedestrian counts were recorded at the intersection of Hopetoun Road and Crawley Street where there is a difference in the north/south bound traffic along Hopetoun Road.
Hopetoun Road is a key north south connection that has bus stops and the small retail located along the route. Being located north of the CBD, the typical behaviour along this street is probably to drive to the local shop and be dropped off at the bus stop.

Inset 3 - Cramer Street

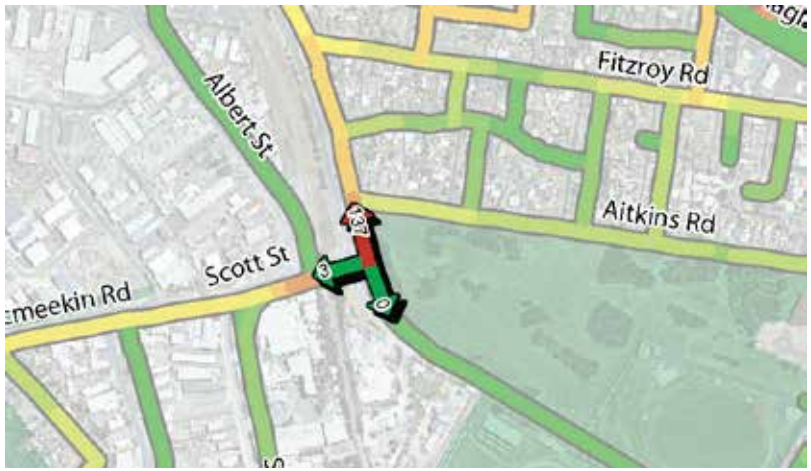
Heading eastbound along Cramer Street there are a range of recreational and entertainment destinations. These destinations will influence the shortest route predictions yet the reality is these are probably destinations that people prefer to drive to the Football Club, Table Tennis Association, Hockey Association and the Bowls Club.

Inset 4 - Gateway Road

The pedestrian counts recorded southbound along Gateway Road were higher than what the shortest route modelling predicted. This is possibly due to the amount of residential housing, and the primary school located south of Raglan Parade.

Inset 5 - Intersection of Giffen Street and McMeekin Road

The pedestrian counts recorded northbound along Giffen Street were slightly higher than the modelling predicted and the counts recorded westbound along McMeekin Road were slightly lower. Whilst there is a park located on this intersection, the closet key destination to this intersection is the major employment area.



4.1.3 SUMMARY OF KEY FINDINGS

The results of the pedestrian counts provide a robust means of validating the shortest route modelling. The majority of pedestrian counts were in alignment with the shortest route analysis, however there were some intersection locations where the modelling and count data provided different results (as outlined on the previous pages). Investigation of these differences reveals local conditions that are influencing factors in these differences. Each of these locations has been considered when delineating the final PPN network.

5. THE PRINCIPAL PEDESTRIAN NETWORK

5.1 THE PRINCIPAL PEDESTRIAN NETWORK

The Pedestrian Access Mapping Analysis and validation undertaken in provided the major input for delineating the PPN.

The shortest route mapping provided an estimate of the potential volumes of pedestrian trips along key streets in the municipality. The pedestrian counts provided validation of the shortest route mapping.
Local knowledge from Council officers also provided another level of validation and identification of additional routes.

The following principles provided the key considerations for delineating the PPN:

- Links that were shown to carry a significant number of potential pedestrian trips in the shortest route mapping were included,
- Links that recorded significant numbers of pedestrians through the pedestrian counts were included,
- Key shopping areas, regardless of size, were included as these are a focus for pedestrian activity and therefore, should be incorporated as part of the PPN,
- Links between key related destinations were included. Connections between a shopping strip and a major nearby park, or the link between a shopping strip and a major transport node are examples of related destinations.
- Existing off-street links or trails that provide readymade priority pedestrian infrastructure and will form an important part the PPN,
- Ensuring a connected network of streets. The PPN should provide continuous pedestrian priority between key origins and destinations therefore all streets within the PPN should be connected.

This may mean that some streets are included in the PPN even when the mapping shows that they have a low number of potential pedestrian trips.

The PPN is delineated in three categories:

- Primary Routes - These routes form the foundation of the PPN where a high level of pedestrian priority is assigned. These routes will be a major focus for the implementation of future walking infrastructure improvements.
- Secondary Routes - These routes will provide a secondary role to the primary routes and will be assigned a high level of pedestrian priority. A secondary focus for future infrastructure works will be assigned to secondary routes.
- Existing Trails - Existing trails provide a high level of priority for pedestrians

The PPN identified in the plan opposite is the result of a process of testing and refining key routes against pedestrian counts, future projections and local knowledge.

The PPN includes a network of primary and secondary routes throughout the study area.

These routes have been identified as the key pedestrian routes that connect people to transport, shops, education, community and health facilities and local open space facilities.

Existing trails have also been identified as part of the PPN and provide important connections between activity centres. This report recommends to investigate the opportunity to connect south Dennington with rail trail, while preparing structure plan for south Dennigton.

A number of workshops were held to provide Council officers the opportunity to provide feedback on the draft PPN. This step was important in validating the PPN routes given the limitations of the shortest route mapping, and utilised local knowledge and their understanding of the municipality.

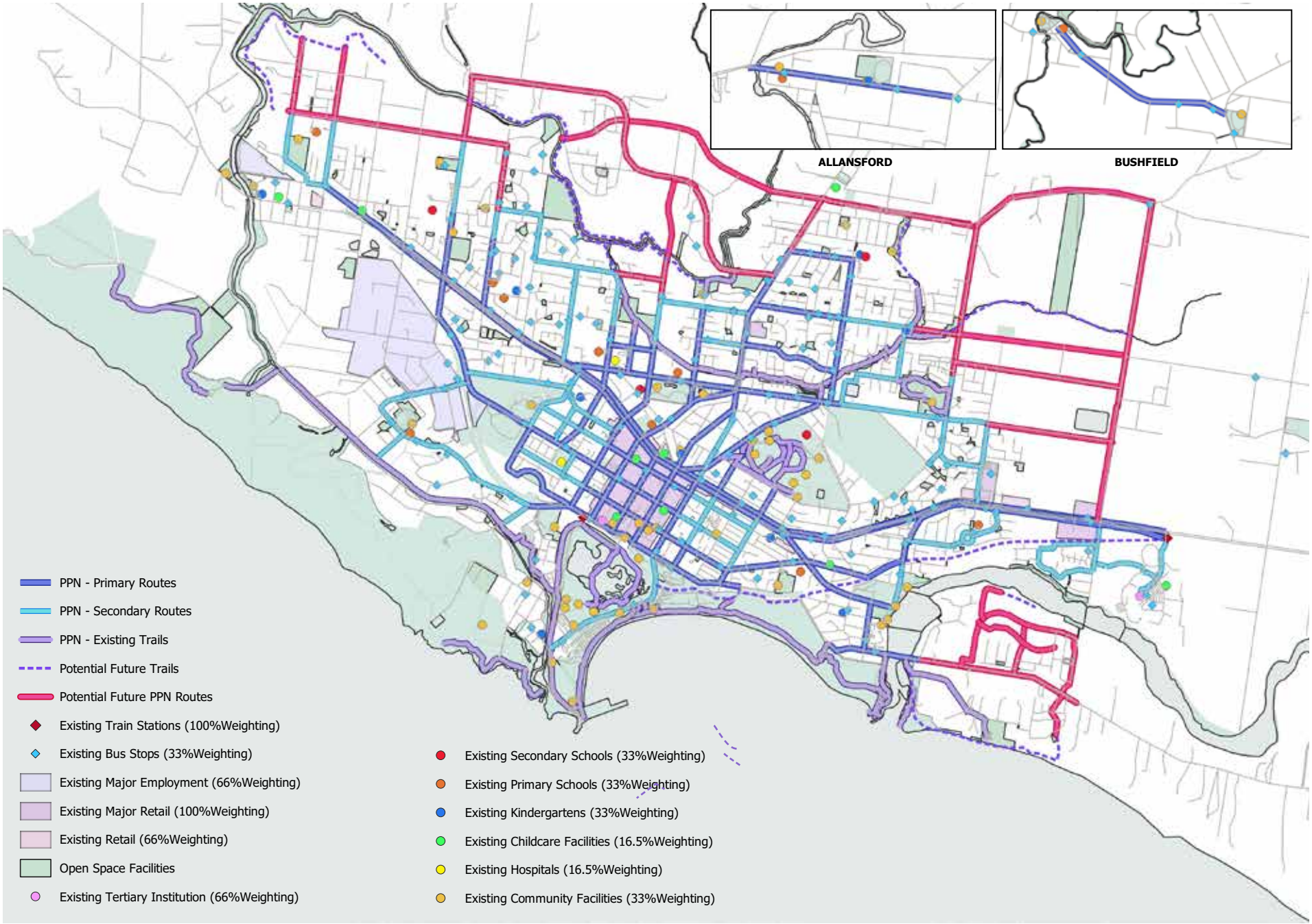


Figure 21 - Principal Pedestrian Network (PPN)

5.1.1 DESIRED LEVEL OF SERVICE TABLE

Warrnambool City Council has developed a desired level of service for those routes identified as primary and secondary PPN routes. The desired level of service establishes an agreed standard of provision for the pedestrian environment.

The key considerations are; minimum footpath width, standard for a number of safe crossing points, pedestrian priority at key intersections (Tactile Ground Surface Indicators), street tree planting standard, shade, shelter and seating, signage and wayfinding, street lighting and vehicle speed environment.

The agreed minimum and desired level of service for the Warrnambool PPN is outlined below.

FACTOR	MINIMUM LEVEL OF SERVICE	DESIRED LEVEL OF SERVICE
Pathway Characteristics		
Primary Pedestrian Route	• Footpath on both sides of the street. • 1.5m minimum width. • Concrete surface for footpath. • Safe level of spacing between pathway and through vehicles.	• Footpath on both sides of the street. • 2.5m wide footpaths on both sides.(n) • Concrete surface for footpath. • Physical separation of pathway from through traffic, via raised kerb, median, parking bays ect. (n)
Secondary Pedestrian Route	• Footpath on at least one side of the street. • 1.5m minimum width. • Asphalt surface for less internsive pedestrain areas.	• Footpath on both sides of the street. • 1.5m minimum width in streets, 2.5m minimum width in parks • Concrete surface for footpath.
Trails	• 2.5m minimum width. • Stabilised Gravel, and compacted gravel surface for less used trails	• 2.5m minimum width. • Concrete path or sealed path.
Pedestrian Crossings		
Primary Pedestrian Route	• Ensure safe crossings with minium waiting time for pedestrians. • Pedestrian priority crossings near all the access points to the PPN. (Near to new estates, residential areas, all the destinations as in shortest route analysis etc.) • Design – As per Aust Road Standards and Vic Roads Accessibility (DDA) Guidelines. • Tactile at intersections.	• Ensure safe crossings with minium waiting time for pedestrians. • Pedestrian friendly crossings at all the access points, Street crossings. • Design – As per Aust Road Standards and Vic Roads Accessibility (DDA) Guidelines. • Tactile at intersections.
Secondary Pedestrian Route	• Ensure safe intersections with minium waiting time for pedestrians. • Pedestrian priority crossings near main access roads. • Min- Pram ramp with line marking.	• Ensure safe intersections with minium waiting time for pedestrians. • Pedestrian priority crossings near main access roads. • Design – As per Aust Road Standards.
Trails	• Ensure pedestrian priority at intersections. • Ensure clear sight-lines from key intersection view points,escape access and egress points.	• Ensure pedestrian priority at all crossings. • Ensure clear sight-lines from all intersection view points,escape access and egress points.

(n) Width of the footpath may also vary with the available road reserve

FACTOR	MINIMUM LEVEL OF SERVICE	DESIRED LEVEL OF SERVICE
Streetscapes		
Primary Pedestrian Route	• Street trees- At least one tree in front of each property. • Street furniture- One rest place (seating) every 500m. Seating Type: Aluminium seating.	• Street trees- At least one tree every 10 meters. • Street furniture- One rest place (seating) every 250m. Seating Type: Aluminium seating - all seating types to specify arm rests to support accessibility.
Secondary Pedestrian Route	• Street trees- At least one tree in front of property. • Street furniture- One rest place (seating) every 500m. Seating Type: Aluminium seating.	• Street trees- At least one tree in front of property. • Street furniture- One rest place (seating) every 500m. Seating Type: Aluminium seating - all seating types to specify arm rests to support accessibility.
Trails	• Street furniture- One rest place (seating) Near to the lookout points. Seating Type: Basic park seating.	• Street furniture- One rest place (seating) every 500m and near to the lookout points. Seating Type: Basic park seating - all seating types to specify arm rests to support accessibility.
Street Lights		
Primary Pedestrian Route	• Lighting as per Australian standards, Min- Typical road lighting, considered in all new design.	• All new lighting as per Australian standards. Dual lighting for streets and footpath. (in areas with dense vegetation)
Secondary Pedestrian Route	• Lighting as per Australian standards, typical road lighting, considered in all new design.	• All new lighting as per Australian standards, typical road lighting.
Trails	• Lighting at trail and road intersections and identified high risk potential, considered in all new design.	• All new lighting at trail and road intersections, lighting on all trails identified as transport routes. (not just recreational)
Signage		
Primary Pedestrian Route	• Map based sign- Major destinations, and directional signs at major intersections.	• Map based sign- All major decision points like (Train Stations, Hospitals, Major recreational hubs, Major retail hubs, Near to industrial estate), and directional signs at all intersections.
Secondary Pedestrian Route	• Directional signs at major intersections.	• Directional signs at all intersections.
Trails	• Map based sign should be along major off road trails totally detached to CBD like Foreshore trails (positioned to the decision points like start , main decision making points and end). And directional signs should be along other trails. (at major intersections)	• Map based sign should be along major Foreshore trails. And directional signs should be along other trails.

6. IMPLEMENTATION

The final stage in the PPN project is implementing the network.
This section of the report provides a guiding framework for the implementation of the PPN.

This chapter outlines the:

1. Proposed Traffic & Intersection Improvements to support the PPN Network
2. Proposed Streetscaping Improvements to Support the PPN Network
3. Missing Links in the PPN Network, and
4. Recommendations for Further Work

6.1 PEDESTRIAN IMPROVEMENT PROJECTS

The key components of a pedestrian network can be broadly categorised into the pedestrian links - footpaths and the supporting pedestrian infrastructure, seating, shelter, signage, lighting and traffic calming measures. For the purposes of developing a PPN it is recommended that both the missing links and the missing pedestrian infrastructure are identified in order to plan for their implementation to support the PPN network.

This chapter outlines the identified missing links and infrastructure and provides justification for their delivery.

6.1.1 MISSING LINKS IN THE PEDESTRIAN NETWORK

The key missing pedestrian links in the existing pedestrian network were identified in a round workshop with Council. The missing links are shared use paths, footpaths, and in some cases upgrades to an existing path. These links are seen as important in creating a connected pedestrian network throughout Warrnambool.

Over 100 missing links have been identified, which poses the question of how the identified paths can be delivered. A set of assessment criteria was developed to evaluate the priority of each path. In order to allocate a delivery priority to each of the identified missing pedestrian links, each link was assessed according to a set of assessment criteria. The criteria included rating the link according to its connectivity, community intrest, SEIFA. Index, mobility user requirements and significant biodiversity values. This resulted in a ranking of priority for each path. The plan opposite shows the results and the details of each path is identified in an Implementation Table in Appendix 2.

Estimated Cost:

Types of Footpath	Estimated rate/m2
Concrete	140
Asphaltic concrete footpath	90
Bituminous Sealed Footpath	75
Gravel Footpath	50

Notes:
These are only indicative rates. The rate would vary depending on the nature of works and would require detailed cost estimation for individual project.

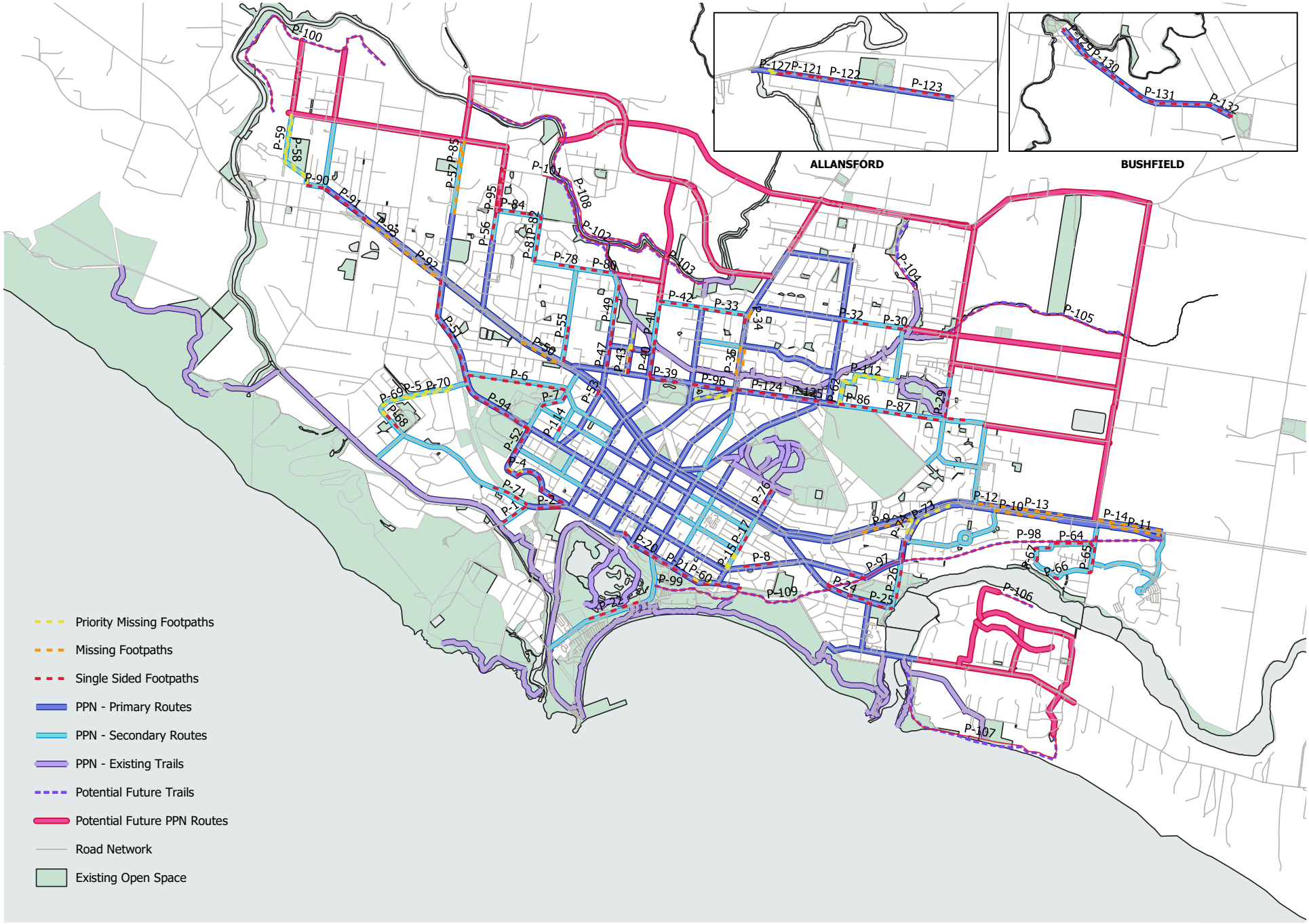


Figure 22- Missing links in the Pedestrian Network

Link Id	Link Name	Link Type	On or OFF road	Length (m)
Priority Missing Footpaths				
P-73	Simpson Street connection from Raglan service Road to Verdon Street (East side)	Footpath	On-road	645.256
P-5	McMeekin Road- Merrivale Drive to Koroit Street (west side)	Footpath	On-road	1037.851
P-43	Wentworth Street -Botanic Road to Barbers lane(West side)	Footpath	On-road	232.489
P-15	Foster Street - Nicholson Street to Holbrook Street (West side)	Footpath	On-road	223.422
P-38	Jamieson Street - Queen Street to Banyan Street (South side side)	Footpath	On-road	218.072
P-77	Taits Road (South connection)	Footpath	On-road	35.169
P-113	Taits Road North connection to Russells Creek	Footpath	On-road	479.086
P-58	Station Road- Drummond Road to Coghlans Road(east)	Footpath	On-road	810.629
P-127	Zieglar Parade- In front of 3- 5 Zieglar Parade (South)	Footpath	On-road	53.213
P-4	Hyland Street - connection to Merri cresent (North side)	Footpath	On-road	172.744
P-62	Taits Road - Moore Street to Russells Creek Connection(West side)	Footpath	On-road	434.825
P-44	Wentworth Street - Barbers lane to Conns lane(West side)	Footpath	On-road	83.861
P-124	Moore st- Mortlake rd to Oak Court (North side)	Footpath	On-road	550.375
P-126	Taits rd- Wares rd to Renoir Dr (North side)	Footpath	On-road	143.703
P-128	Zeiglar Parade- Alice st to 12 Zeigler parade (North)	Footpath	On-road	89.052
P-132	Bridge Road - Hopkins Hway to Reddie Road (South side)	Footpath	On-road	264.296
Missing Footpaths (not possible to cross road/highway)				
P-12	Raglan Parade- Bescott Street to Gateway Road (North side)	Footpath	On-road	147.938
P-89	Mortlake Road- Hayley drive to Service Road connection (east side)	Footpath	On-road	47.79
P-34	Mortlake Road - Hayley drive to Service Road connection (east side)	Footpath	On-road	73.418
P-35	Mortlake Road - Russells Creek Trail to Allan Street (West side)	Footpath	On-road	285.456
P-10	Raglan Parade- South connection to Selby Road	Footpath	On-road	766.62
P-11	In front of Sherwood Park Train Station	Shared path	On-road	588.563
P-9	Raglan Parade- Simpson Street to Verdon Street (South side)	Footpath	On-road	638.845
P-50	Raglan Parade- Fitzroy Road to Laverock Grove (South side)	Footpath	On-road	472.93
P-92	Raglan Parade-Walsh Road to Rooneys rd	Footpath	On-road	484.56

P-36	Mortlake service Road to Russel creek	Footpath	On-road	171.551
P-93	Raglan Parade-Rooneys Road to Drummond Street	Footpath	On-road	448.773
P-14	Raglan parade- North side connection to Horne Road	Footpath	On-road	791.145
P-57	Caramut Road - Fotheringham Street to Coghlans Road	Footpath	On-road	706.239
P-13	Raglan parade- Horne Road to Bescott Street (north side)	Footpath	On-road	864.326
P-85	Caramut Road - Stadium entrace to Coghlans Road	Footpath	On-road	204.863
Single Sided Footpaths				
P-51	Walsh Road/Giffen Street- McMeekin Road to Raglan Parade	Footpath	On-road	1100.018
P-2	Wellington Street- Rail to Harris Street(south side)	Footpath	On-road	191.599
P-3	Wellington Street-Merri Street to Rail(south side)	Footpath	On-road	102.456
P-33	Donovans Road- Queen Street to Mortlake Road(South side)	Footpath	On-road	647.014
P-8	Nicholson Street- Barkley Street to Foster Street via service Road	Footpath	On-road	428.1
P-40	Bromfield Street-Botanic Road to Russells creek path (East side)	Footpath	On-road	310.755
P-20	Merri Street - Pertobe Road to Liebig Street (South side)	Footpath	On-road	199.125
P-21	Merri Street- Flume carpark to Flagstaff hill (South side)	Footpath	On-road	1138.566
P-54	Hopetoun Road- Raglan parade to Mercy Place Aged Care Facility (East side)	Footpath	On-road	242.297
P-45	Wentworth St (Botanic Rd to Barbers Lane) - Barbers Lane (Wentworth St to Bromfield St)	Footpath	On-road	481.893
P-72	Merri Street- Gillies Street to Liebig Street (North side)	Footpath	On-road	126.43
P-96	Botanic Road- Banyan st to Queen Street (South side)	Footpath	On-road	468.764
P-55	Hopetoun Road- Mercy Place Aged Care Facility to Crawley Street (East side)	Footpath	On-road	81.136
P-39	Botanic Road- Bromfield Street to Queen Street (south side)	Footpath	On-road	340.101
P-52	Merri Cresent/Hyland Street- Merri Street to Koroit Street	Footpath	On-road	1363.449
P-53	Hider Street- Panorama Ave to Raglan Parade (west side)	Footpath	On-road	90.445
P-65	Mahoney Road- Princess highway to Dobson way (East side)	Footpath	On-road	381.491
P-91	Drummond Street- Raglan Parade to Russel Street	Footpath	On-road	555.673
P-111	Moore Street - Garden Street to Taits Road (North side)	Footpath	On-road	121.909
P-27	Simpson Street- Verdon Street to Rail trail (East side)	Footpath	On-road	191.803

P-28	Dales Road- Moore Street to Gateway Road (North side)	Footpath	On-road	233.636
P-29	Aberline Road- in front of Brierly Rec Reserve (East side)	Footpath	On-road	261.979
P-42	Donovans Road - Bromfield Street to Queen Street(North side)	Footpath	On-road	473.155
P-47	Ardile Street- Botanic Road to Barbers lane	Footpath	On-road	190.51
P-76	Foster Street- Coulstock Street to Skene Street (west side)	Footpath	On-road	162.703
P-83	Woodend Road- Laverock Road to Mountain Ash Drive (North side)	Footpath	On-road	195.522
P-84	Woodend Road- Morris Road to Mountain Ash Drive	Footpath	On-road	329.188
P-95	Morris Road- Vickers drive to Thomas place	Footpath	On-road	580.563
P-64	Huntingfield Drive- Mahoney Road to O'Sullivan Drive(North side)	Footpath	On-road	749.004
P-1	Wellington Street- Merrivale drive to Wellington Street bridge (west side)	Footpath	On-road	297.193
P-24	Otway Road- Ilex Avenue to Simpson Street (North side)	Footpath	On-road	541.709
P-25	Otway Road- Hopkins rd to Simpsons Road (South side)	Footpath	On-road	299.425
P-32	Whites Road- Garden Street to Carlyle dt (south side)	Footpath	On-road	166.502
P-48	Ardile Street- Barbers lane to Conns lane	Footpath	On-road	80.778
P-71	Merrivale drive- Wellington Street to Merrivale connection (north side)	Footpath	On-road	433.119
P-90	Drummond Street- Russell Street to Station Street	Footpath	On-road	197.569
P-94	Koroit Street- Hyland Street to McMeekin Road	Footpath	On-road	868.049
P-6	Atkins Road - Hyland Street to Giffen Street(south side)	Footpath	On-road	1217.536
P-7	Hyland Street- Lava Street to Kerr Street (east side)	Footpath	On-road	351.128
P-19	Japan Street- Hotham Street to Koroit Street (East side)	Footpath	On-road	74.812
P-26	Simpsons Street- Otway Road to Railtrail (east side)	Footpath	On-road	323.693
P-30	Whites Road- Wares Road to Cherlin drive(south side)	Footpath	On-road	177.469
P-41	Bromfield Street- Russells creek path to Donovans Road (East side)	Footpath	On-road	408.399
P-56	Morris Road- Kermond ct to vickers drive	Footpath	On-road	87.09
P-68	McMeekin Road- Merrivale Oval entrance to McCullagh Ct	Footpath	On-road	174.858
P-75	Bostock Road- Ilex Avenue to Deakin rail trail (South side)	Footpath	On-road	176.058
P-49	Ardlie Street - Conns Lane to Russells Creek Walking path(East side)	Footpath	On-road	487.912
P-81	Laverock Road- Daltons Road to Membery way (east side)	Footpath	On-road	317.074
P-16	Foster Street- Holbrook St to Barkley Street(East side)	Footpath	On-road	90.889

P-17	Foster Street- Lava Street to Barkly Street (East side)	Footpath	On-road	106.724
P-22	Pertobe Road- In front of Lake Pertobe (West side)	Footpath	On-road	602.186
P-87	Moore Street (In front of Racecourse- South side)	Footpath	On-road	594.783
P-88	Moore Street In front of Racecourse to McKiernan Road(South side)	Footpath	On-road	214.196
P-114	Murray Street- Kruger Street to Lava Street	Footpath	On-road	98.054
P-31	Whites Road - Vidler Street to Carlyle ct (south side)	Footpath	On-road	115.021
P-66	Dobsons way- infront of 34, Dobsons way	Footpath	On-road	102.026
P-67	O'Sullivan Drive- in front of 53 Dobsons way	Footpath	On-road	39.323
P-78	Daltons Road - Membery way to Kagoola Ave(north side)	Footpath	On-road	105.205
P-79	Daltons Road- Grosvenor to Membery Way (North side)	Footpath	On-road	272.43
P-80	Daltons Road- Russells creek to Grovenor Road	Footpath	On-road	265.329
P-125	Moore st- Oak Court to Russells Creek Trail(North side)	Footpath	On-road	221.879
P-130	Bridge Road- Brodies Lane to Albert Street(South side)	Footpath	On-road	378.273
P-131	Bridge Road - Reddie Road to Brodies Lane (South side)	Footpath	On-road	1146.372
Future Trails				
P-97	Deakin Link- Railtrail from Jukes Street to Bostock Street	Shared path	Off-Road	442.702
P-110	Deakin Rail trail from Bostock Street to Flaxman Street	Shared path	Off-Road	430.362
P-109	Deakin Rail trail-Flaxman Street to Flume Car park (via Foreshore trail)	Shared path	Off-Road	1304.594
P-98	Deakin Link- Railtrail from Deakin to Simpson Street	Shared path	Off-Road	3282.054
P-104	Missing connection of Russels Creek Walking Path behind Kings College	Shared path	Off-Road	472.445
P-99	Deakin Link- Railtrail from Flume car park to Lake Pertobe	Shared path	Off-road	1091.657
P-102	South merri (Tarhook Road)to Russel Creek trail	Shared path	Off-Road	1415.702
P-103	South Merri ,from Queens Road to Russells creek trail	Shared path	Off-Road	1359.065
P-101	Tarhook Road to South Merri trail	Shared path	Off-Road	61.783
P-100	Dennington - Merri trail (Growth area)	Shared path	Off-Road	2906.002
P-107	Foreshore Trail from Hopkin point to Southern Ocean Bolevard (Growth area)	Shared path	Off-Road	2267.746
P-106	North Hopkins Trail (Growth area)	Shared path	Off-Road	439.579
P-108	North of Merri Trail (Growth area)	Shared path	Off-Road	3673.208

6.1.2 PROPOSED PEDESTRIAN IMPROVEMENTS PROJECTS

The plan opposite identifies missing traffic interventions have been identified as and are recommended to support the proposed PPN. These are traffic calming interventions that impact on pedestrian comfort and safety. They are categorised according to:

- Pedestrian crossing improvements,
- Traffic and or pedestrian s improvements or adjustments,
- Pedestrian refuge island improvements, or
- Intersection or roundabout improvements.

The location of the recommendation and data source in listed in Table 6.1.3 on the next page.

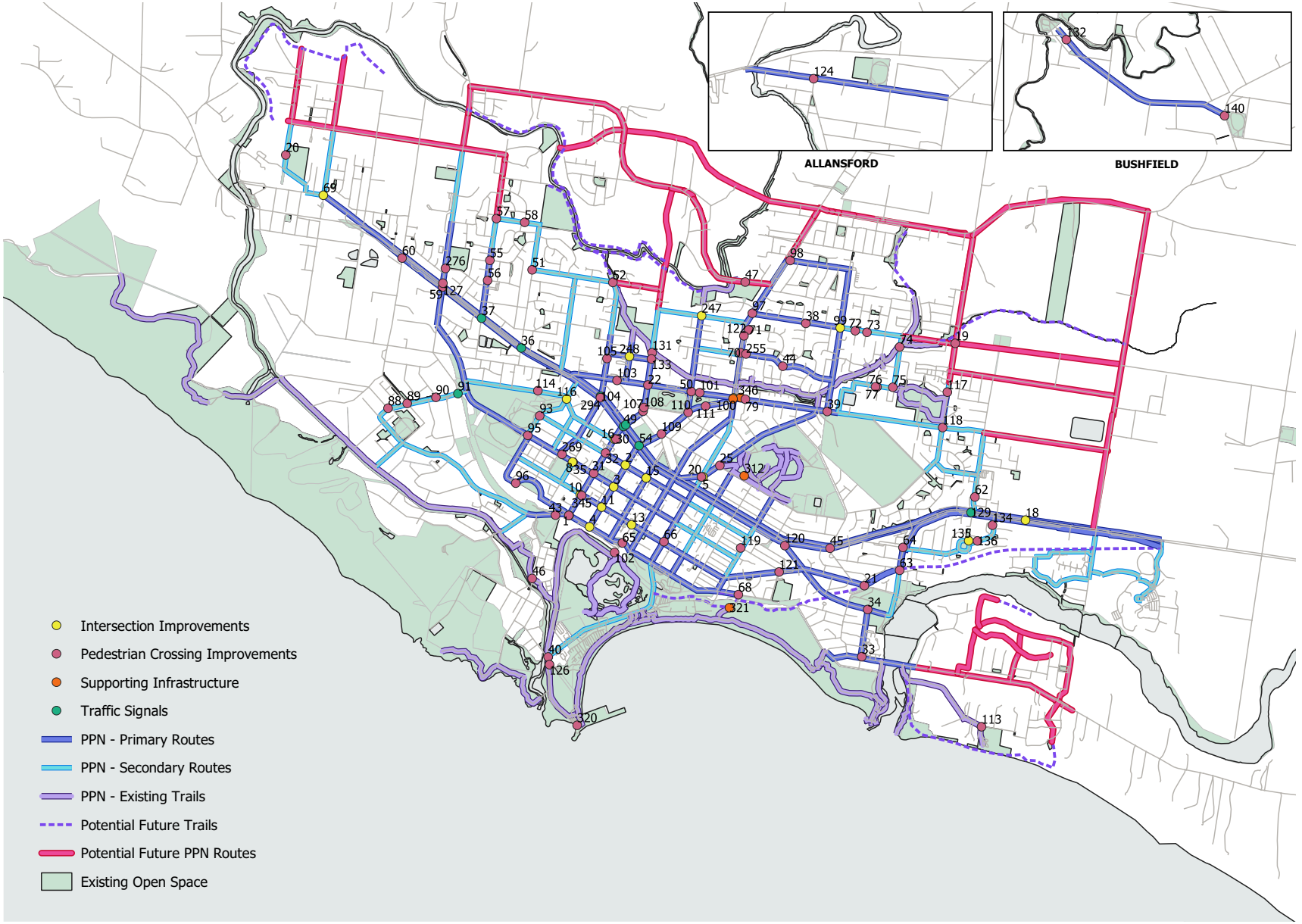


Figure 23 - Proposed Pedestrian Improvements Plan

Estimated Cost:

Types of work	Estimated Cost	Notes
Intersection improvement	$40,000 to $60,000 for Median refuge	These are only indicative costs. Depending on the nature of works on individual intersection, the cost would vary and would require detailed cost estimation.
	$13,000 to $20,000 for Kerb extension	
Pedestrian Crossing	$120-$150k	These are only indicative costs. Depending on the nature of works on individual intersection, the cost would vary and would require detailed cost estimation.
Traffic Signal improvements	$200-$300K for Traffic Signals Installation	These are only indicative costs. Depending on the nature of works on individual intersection, the cost would vary and would require detailed cost estimation.
	$20,000-$30,000 for Traffic Signal Optimization	

6.1.3 PEDESTRIAN IMPROVEMENTS TABLE

ID	Project	Address
8	Intersection Improvement	Koroit Street / Ryot Street
1	Intersection Improvement	Merri Street / Henna Street
2	Intersection Improvement	Fairy Street / Lava Street
3	Intersection Improvement	Fairy Street / Koroit Street
4	Intersection Improvement	Merri Street / Fairy Street
5	Intersection Improvement	Banyan Street/Cramer Street/Skene Street
7	Pedestrian crossing	Bromfield Street exit on to north of Merri (Ped bridge)
10	Intersection improvement	Henna Street / Timor Street
11	Intersection improvement	Fairy Street / Timor Street
13	Intersection improvement	Gilles Street / Timor Street
15	Intersection improvement	Kepler Street / Lava Street
16	Intersection Improvement	Henna Street / Kerr Street
100	Intersection improvement	Jamieson Street / Botanic Road/ Mortlake Road
118	Intersection Improvement	Raglan Parade / Glynbudy Street
19	Pedestrian crossing	Whites rd/ Aberline Rd
20	Pedestrian crossing	Banyan Street/Cramer Street/Skene Street
21	Pedestrian crossing	Bostock Rail overbridge
22	Pedestrian crossing	Bromfield Street/ Botanic Rd
50	Pedestrian crossing	Botanic Rd/ Queens rd
107	Pedestrian crossing	Canterbury Rd/King Street
25	Pedestrian crossing	Cramer Street/Coulstock Street
30	Pedestrian crossing	Henna woolworth's Intersection
31	Pedestrian crossing	Koroit Street/ Henna Street
32	Pedestrian crossing	Lava Street/Henna Street
33	Pedestrian crossing	Hopkins/ Marfell Road
34	Pedestrian crossing	Otway rd/ Hopkins Road
35	Pedestrian crossing	Koroit Street / Ryot Street
36	Traffic signals Improvements	Raglan/Laverock Road
37	Traffic signals Improvements	Raglan/Morris Road
38	Pedestrian crossing	Whites Road/ Minerva drive
39	Pedestrian crossing	Moore Street/ Garden Street
40	Pedestrian crossing	Pertobe Road/ Stanley Street
43	Pedestrian crossing	Wellington Street / railway crossing
44	Pedestrian crossing	Evelyn Cr / Breton Street
45	Pedestrian crossing	Raglan/Bell Street/ Derby Street
46	Pedestrian crossing	Harris Street- Merri bridge
344	Pedestrian crossing	Merri Street/ Henna Street
49	Traffic signals Improvements	Raglan/Henna
47	Pedestrian crossing	St James Park trail/ Woolaston Road
51	Pedestrian crossing	Laverock Road/ Daltons Road
52	Pedestrian crossing	Daltons Road/Ardile Street/Russell creek trail
345	Pedestrian crossing	Henna Street / Timor Street
54	Traffic signals Improvements	Raglan/Jamieson Street
55	Pedestrian crossing	Morris Road/ Pecten Avenue
56	Pedestrian crossing	Morrris Road/ Ross Street
57	Pedestrian crossing	Morris Road/ Woodend Road
58	Pedestrian crossing	Woodend Road/ Mountain Ash drive
59	Pedestrian crossing	Raglan/Walsh Road
60	Pedestrian crossing	Raglan Parade/ Rooneys Road
18	Pedestrian crossing	Aberline Road/ Dales Road
62	Pedestrian crossing	Gateway Road/ Gateway Plaza entrance
63	Pedestrian crossing	Simpson Road/Railway trail
64	Pedestrian crossing	Simpson Street/ Verdon Street
65	Pedestrian crossing	Carpark to Liebig ped crossing
66	Pedestrian crossing	Banyan Street Ped crossing

68	Pedestrian crossing	Flume carpark entrance
69	Intersection Improvement	Drummond street/ Russell Street
70	Pedestrian crossing	Mortlake Road/Breton Street
71	Pedestrian crossing	Hayley Drive entrance from Mortlake road
72	Pedestrian crossing	Whites Road/ Zammit Drvie
73	Pedestrian crossing	Whites Road/ Vidler ct
74	Pedestrian crossing	Wares Road/ Russell Creek Trail
75	Pedestrian crossing	Taits Road/ Wares Road
76	Supporting infrastructure	Taits Road/ Nearhfield Ct
77	Pedestrian crossing	Taits Road/ Nearhfield Ct
346	Supporting infrastructure	near to 2 Mortlake Road
347	Supporting infrastructure	Mortlake Road/ Botanic Road/ Jamieson St
79	Pedestrian crossing	Moore St- Kiama Av
88	Pedestrian crossing	Gay Street, Entrance to McMeekin Road
89	Pedestrian crossing	Granter Street, Entrance to McMeekin Road
90	Pedestrian crossing	Cooper Street, Entrance to McMeekin Road
91	Traffic signals Improvements	Midfield, McMeekin Rd/ Albert St intersection
93	Pedestrian crossing	Hyland Street to Lava Street
95	Pedestrian crossing	Koroit Street/ Hyland Street
96	Pedestrian crossing	Merri Cr
97	Pedestrian crossing	Whites rd entrance, Mortlake Road
98	Pedestrian crossing	Balmoral Road/ Mortlake Road
99	Intersection Improvement	Whites rd/ Garden Street
101	Pedestrian crossing	Aquazone access, Botanic Road
103	Pedestrian crossing	Botanic Road/ Canterbury Road
104	Traffic signals Improvements	Ardile Street/ Hider Street
105	Pedestrian crossing	Emmanual college entrance from Ardile st
107	Pedestrian crossing	Canterbury Road/King Street
108	Pedestrian crossing	Emmanual college access, Bromfield Street
109	Pedestrian crossing	Jamieson Street/ Princess Street
110	Pedestrian crossing	Jamieson Street/ Queens Road
111	Pedestrian crossing	Access pathway Aquazone,Carpark,- Jamieson Street
113	Pedestrian crossing	Banyan Street/ Cramer Street/ Skene Street
114	Pedestrian crossing	McKnight Street entrace to Aitkins Road
116	Intersection Improvement	Kerr Street/Hyland Street
117	Pedestrian crossing	Aberline Road/ Mitchell Street
118	Pedestrian crossing	Aberline/ Dales Road
119	Pedestrian crossing	Foster Street/ Barkley Street
120	Pedestrian crossing	Raglan/ Flaxmann Street
121	Pedestrian crossing	Nicholson Street/ Ward Street
122	Pedestrian crossing	Mortlake/ Northpoint entrance
124	Pedestrian crossing	Tooram Road/ Zeiglar Parade
126	Pedestrian crossing	Viaduct Road
127	Pedestrian crossing	Raglan/ Caramut
128	Traffic signals Improvements	Raglan/King
129	Traffic signals Improvements	Raglan/ Gateway Road
131	Pedestrian crossing	Bromfield/ Russellls creek trail
132	Pedestrian crossing	Bridge Road, near to Woodford primary School
133	Pedestrian crossing	Bromfield/ St.Joseph Primary school access
134	Pedestrian crossing	Selby Road/ Auty Street/ East Warrnambool Primary school access
135	Intersection Improvement	Selby Road/ East Warrnambool Primary school entrance
136	Pedestrian crossing	Selby Road/ East Warrnambool Primary school entrance
140	Pedestrian crossing	Hopkins Hwy-Bridge Rd

247	Pedestrian Crossing	Queens Rd-Donovans Rd intersection
248	Pedestrian Crossing	Wentworth St-Barbers Lane
255	Pedestrian Crossing	Breton St-School
269	Pedestrian Crossing	Koroit St-Hptal Community Bldg
276	Pedestrian Crossing	Corner fairfax avenue - caramut road
294	Pedestrian Crossing	Raglan Parade- Hider street - Ardlie street intersection
320	Pedestrian Crossing	Breakwater path
312	Supporting Infrastructure	Albert Park
321	Supporting Infrastructure	Flume carpark

6.1.4 PROPOSED STREETSCAPE IMPROVEMENTS

A high level audit of the existing streetscape conditions was undertaken to identify any major missing pieces of pedestrian infrastructure in the pedestrian network throughout the CBD. The walking audit undertaken by Council also identified infrastructure that would significantly improve levels of walkability throughout Warrnambool.

The key considerations were in identifying where the streetscape conditions need to be improved to be able to provide the required level of service for primary and secondary PPN routes. The audit did not detailed luminous intensity distribution analysis of street lighting.

There were some general conditions that were common across the study area, most intersections do not have tactile (excluding the recently constructed footpaths in the CBD). The plan opposite shows the areas of missing tree canopy rest stop buffer and missing ambient street lighting.

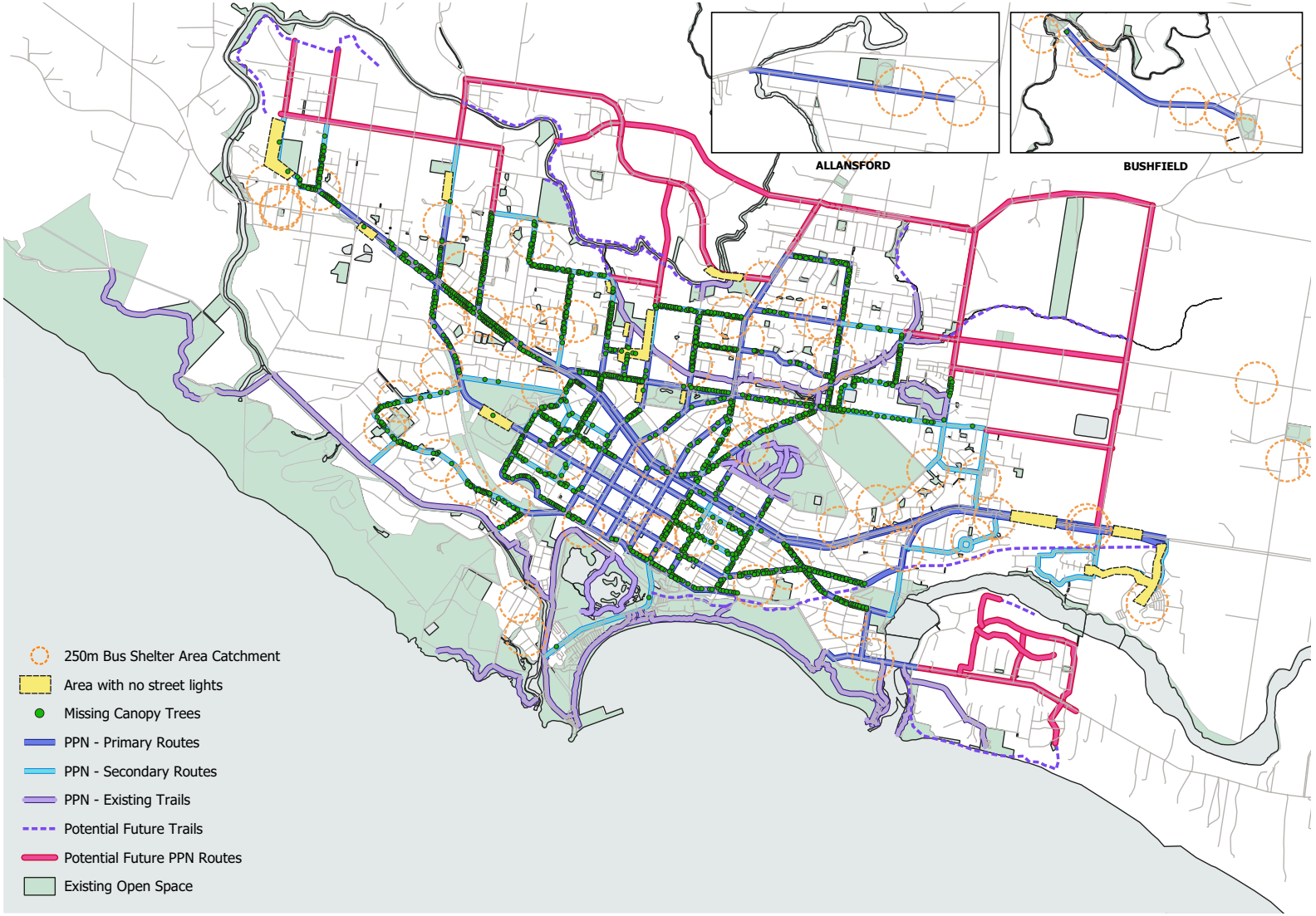


Figure 24 - Proposed Streetscaping Improvements to support the PPN Network

6.1.4.1 STREET LIGHTS

The high level analysis of street lighting along the principal pedestrian network was done to identify the dark stretches, which needs street lighting to meet the desired level of service. The audit did not considered the detailed luminous intensity distribution analysis of existing street lights. The plan above shows the missing ambient street lighting stretches and the table names the dark stretched which require street lighting.

Type of works	Estimated cost	Notes
Install pole, light and power	$10,000-$12,000	These are only indicative rates. The rate would vary depending on the nature of works and would require detailed cost estimation for individual project.
Upgrade/replace existing lights	$1600-$2200	The cost would depend on the type of light.

6.1.4.2 STREET TREES

The street tree audit conducted by Council has identified the vacant sites for new street trees. As the service level along the PPN mentions the requirement of shades to facilitate comfortable walking. This report recommends a Street Tree Planting Program along the Principal pedestrian network.

Type of works	Estimated cost	Notes
Planting a tree	$150 per tree	This is the initial cost for planting a tree. The maintenance cost of the tree during its lifetime is not included.

6.1.4.3 STREET FURNITURE

In regards to the provision of rest stops, the plan shows the location of bus shelters, which also function as rest areas, with a 250m catchment.
It is recommended that a street furniture audit be undertaken to identify where there are missing pieces of street furniture such as seating.

Priorotised Dark Stretches for Street lighting

ID	Segment name	Length (m)
20	Station Street (Preston street to Coghlans Road)	656
264	Bromfield Street (New Life Christian Church entrance to Donovans Road)	555
179	Caramut Road (Along industrial area)	450
265	Raglan Parade (in front of 53-83 Raglan Parade)	434
17	Koroit Street (showground entrance to Hyland Street)	340
256	Caramut Road (Brauer College to Warrnambool Stadium)	300
23	Wollaston Road (Bridge)	290
24	Barbers Lane (Wentworth Street to Bromfield Street)	272
26	Raglan Parade (in front of 10671 - 10699 Raglan Parade)	252
42	Morris Street (Woodend Road to Mountain Ash Drive)	224
53	Aberline Road (Boiling Down Road to Whites Road)	182
257	Raglan Parade (Grevilla Ct to Drummond Street)	176
61	Wentworth Street (St.John of God hospital carpark to Conns Street)	172
81	Bromfield Street (Cockman Street to Botanic Road)	157
85	Mahoneys Road (Gillin Park Retirement Village entrance to Dobson Way)	134
180	Queens Street (Jamieson Street to Botanic Road)	128
94	Ardile Road (Spring Garden to Daltons Road)	112
106	Wentworth Street (Conns Street to Russells Creek Trail)	100
290	Brierly Street, Pencoed Ave, Taits Road to Wares Road	790
317	Foster Street	1057
281	Wollaston Road (Summerville Bvd to the bridge)	2055
271	Coghlans Road (Dennington to Caramut Road)	474