

# ATTACHMENT BOOKLET 2

**ORDINARY COUNCIL MEETING**

**TUESDAY 27 JUNE 2017**

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## MANLY BEACH, WHARF AND TOWN CENTRE PEDESTRIAN ACCESS & MANAGEMENT PLAN DRAFT

FOR

NORTHERN BEACHES COUNCIL



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## **1. INTRODUCTION**

### **1.1 BACKGROUND**

Northern Beaches Council is exploring ways to identify an integrated pedestrian network for Manly Beach, Wharf and Town Centre. To assist in this identification, Council is developing a Pedestrian Access and Mobility Plan (PAMP). A PAMP provides a framework for developing or improving future pedestrian routes and key areas in need of reformed accessibility, as identified by the community. It aims to coordinate the mobility needs of all members of the community and requirements of existing pedestrian policies into a safe, convenient and integrated pedestrian network.

A previous PAMP was conducted on the area surrounding Pittwater Road and Balgowlah Road, Manly in 2015. The study was required due to the lack of pedestrian routes relative to the number of pedestrian attractors in Manly. The PAMP resulted in the construction and upgrades of several footpaths and bus stops, improving the overall pedestrian network within the area.

Bitzios Consulting has been commissioned by Northern Beaches Council to develop a PAMP for Manly Beach, Wharf and Town Centre. This report presents the findings of the study and contains:

- An assessment of the existing situation, pedestrian desire lines and activity centres;
- Deficiencies in the existing pedestrian network;
- Presentation of community consultation and stakeholder issues;
- An audit of identified pedestrian routes; and
- A list of recommendations for future projects for Council to consider.

### **1.2 STUDY OBJECTIVES**

The aim of a PAMP is to provide a plan to improve pedestrian safety and to promote walking within the study area. The key objectives of the Manly Beach, Wharf, and Town Centre PAMP are to:

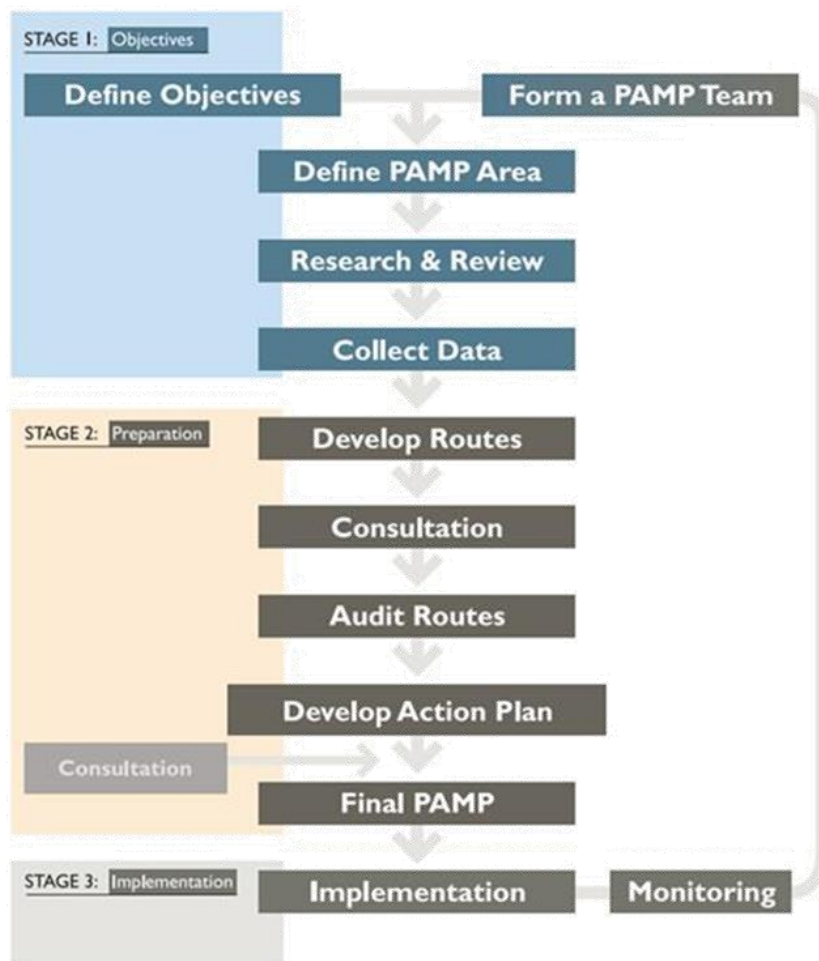
- Facilitate sustainable improvements regarding pedestrian access and priority, particularly in areas of pedestrian concentration;
- Reduce access severance, as well as enhance safe and convenient crossing opportunities on major roads;
- Identify and propose solutions to any pedestrian "crash clusters";
- Improve personal mobility and safety of persons with a disability and senior citizens by favouring pedestrian infrastructure and facilities which cater to all users;
- Provide links with other transport services to achieve an integrated network of transport facilities that comply with best practice technical standards;
- Develop a guiding policy and strategy for the key areas, coordinating current Council plans including for example, the Northern Beaches Council Development Control Plan (DCP) and the Local Environment Plan (LEP);
- Ensure that pedestrian facilities remain appropriate and relevant to the surrounding land use and pedestrian user groups;
- Enable pro-active infrastructure planning from all available funding sources, and identify required partnerships with other government agencies;
- Further Council's obligations under the Disability Discrimination Act (DDA) (1992) with a focus on the requirements of DDA compliant bus stops; and
- Establish a prioritised works program that includes works schedules, maintenance and upgrade programs to integrate into the Northern Beaches Council plans.



### 1.3 PAMP METHODOLOGY

This PAMP was assembled in accordance with the NSW Roads and Maritime Services (RMS) Guide - 'How to Prepare a Pedestrian Access and Mobility Plan'. The document identifies three stages in the PAMP process, shown in Figure 1.1, including:

- **Stage 1:** Objectives definition;
- **Stage 2:** Preparation and Community consultation; and
- **Stage 3:** Implementation.



Source: Roads and Maritime Services – 'How to Prepare a Pedestrian Access and Mobility Plan'

**Figure 1.1: PAMP Development Methodology**

### 1.4 REPORT STRUCTURE

This report has been structured to provide:

- A background on the study area, including demographics and existing public transport facilities;
- A review of relevant documentation, crash data and previous studies in the area;
- The findings of the study investigations, route audits, and stakeholder responses; and
- Recommendations to improve pedestrian facilities and encourage walking and the use of public transport within the study area.

## 2. CHARACTERISTICS OF THE STUDY AREA

### 2.1 GEOGRAPHY

The Manly Local Government Area (Manly LGA) has been part of the Northern Beaches LGA since 2016, with an area of 15.14km<sup>2</sup>, encompassing Manly, Balgowlah, Balgowlah Heights, Clontarf, Fairlight, and Seaforth. It is situated 17km northeast of the Sydney CBD, amongst the Northern Beaches.

The study area lies within the suburb of Manly, and includes the Manly Town Centre, Manly Beach, and Manly Wharf. These areas include the foreshore, residential areas, neighbourhood centres within the Town Centre and associated connections with public transport and other facilities. The area is defined by the following boundaries:

- to the north by Manly Creek;
- to the south by Sydney Harbour National Park;
- to the east by the Tasman Sea; and
- to the west by Balgowlah Road and its southern projection to Commonwealth Parade.

The study area is shown below in Figure 2.1.

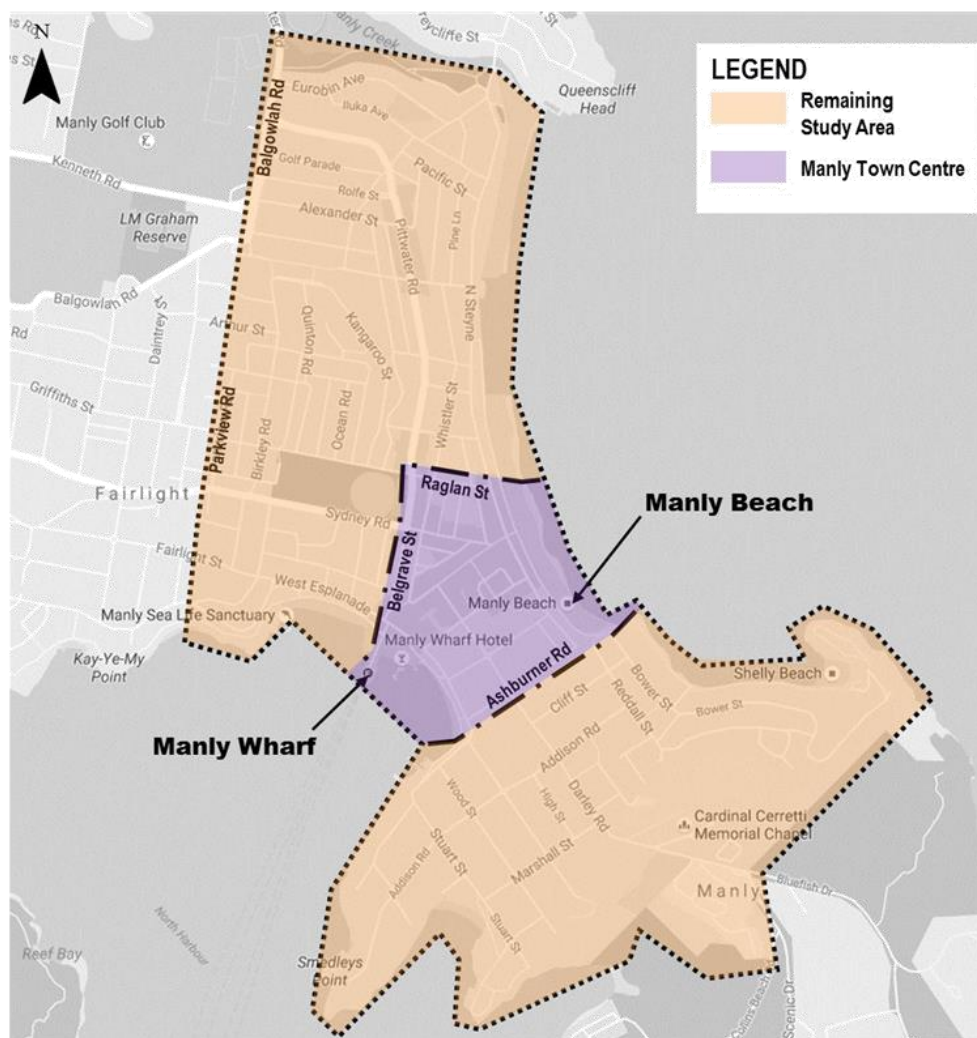


Figure 2.1: Manly PAMP Study Area



Elevations in the Manly region are shown in Figure 2.2. The Manly Town Centre and foreshore areas are flat with inclines to the south towards Sydney Harbour National Park, and to the west of Pittwater Road. There is a steep incline encompassing the southern section of the study area, the main route that traverses this hill is Darley Road. With Manly Hospital and Paul's Catholic College located in this section, adequate accessibility is important. Footpaths have been implemented on both sides of Darley Road from the Manly Town Centre to the hospital.

Another incline is situated to the north-west; accessibility to this area is important for residents in the region. Similar to the southern elevation, most streets have footpaths on both sides of the road.

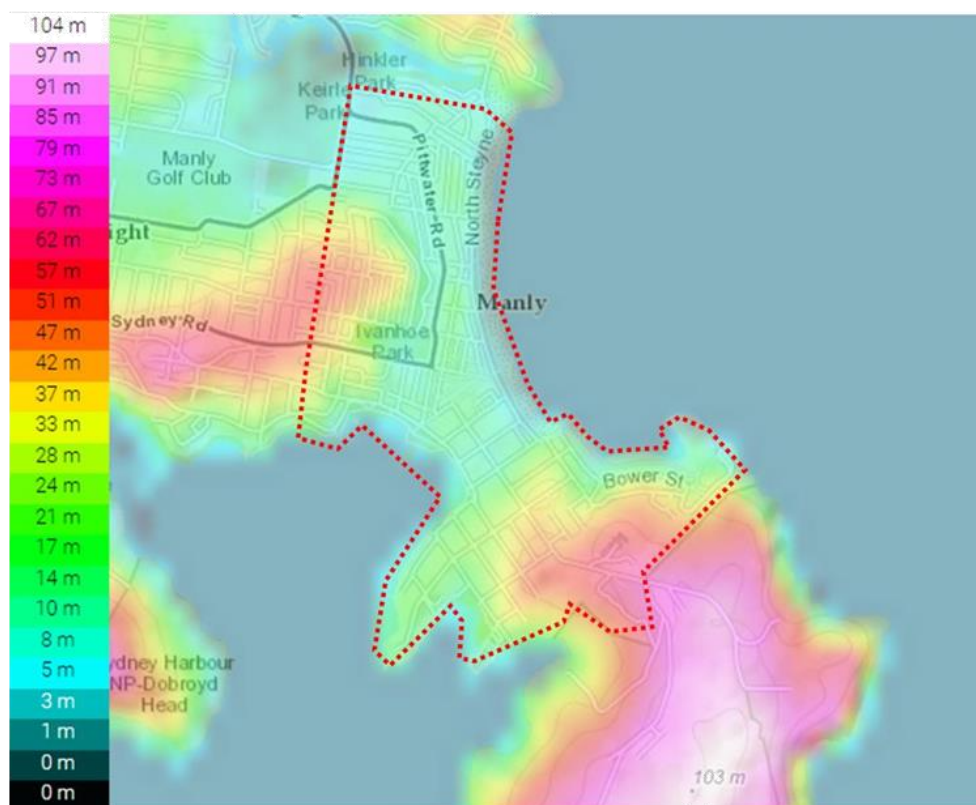


Figure 2.2: Topography map of study area

## 2.2 LAND USES

Land uses throughout the study area vary with sections of residential, public and private recreation, infrastructure, tourist areas, neighbourhood and local centres, areas of environmental conservation, national parks, and nature reserves.

Residential development in the study area is predominantly low density residential development with pockets of medium density residential. Low density residential areas are situated west and southeast of the Manly Town Centre, while medium density areas are located along the eastern foreshore north of the Town Centre. Retail and commercial developments are concentrated within the Manly Town Centre with smaller corridors of Neighbourhood Centres to the north of the study area along Pittwater Road. The land uses in the study area are shown in Figure 2.3.

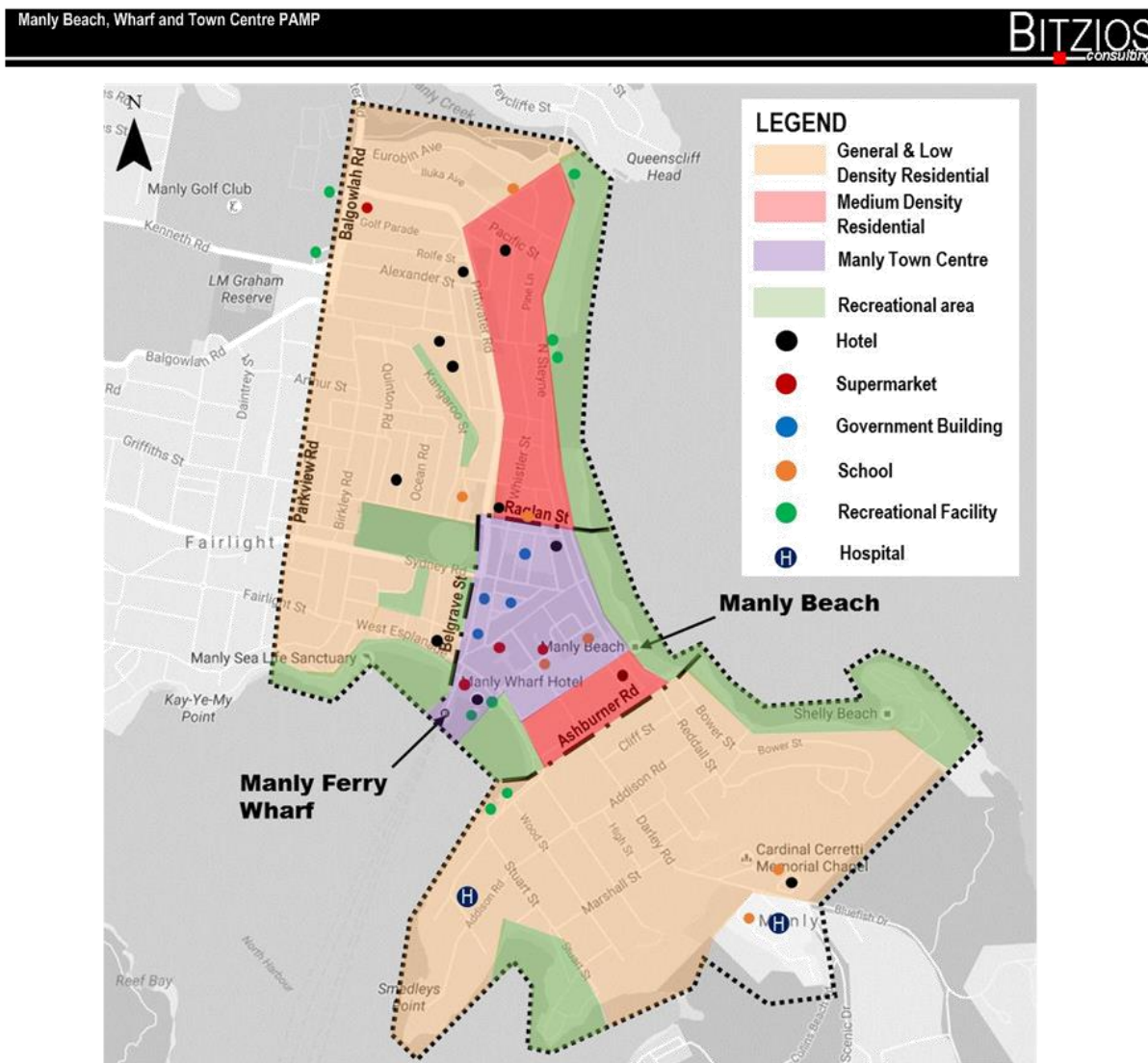


Figure 2.3: Land Uses in the Study Area

## 2.3 POPULATION AND DEMOGRAPHICS DATA

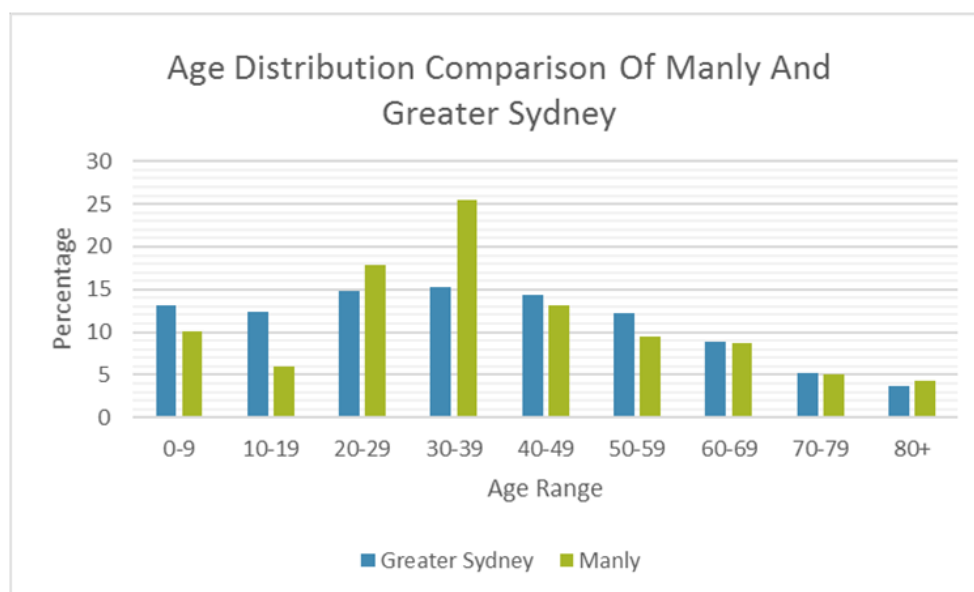
Due to the lack of availability of the statistics of the 2016 Census from the Australian Bureaus of Statistics (ABS), results of the 2011 Census were studied instead. The 2011 Census data, published by the ABS, provides a demographical overview of the study area. The data shows the Manly suburb has a total population of 15,072 with a median age of 35. A comparison of age distribution in the Manly suburb and Greater Sydney was made. The Greater Sydney area, as defined by the ABS, extends from Mandalong in the north to Yanderra in the south, across to Mount Victoria in the west and encompassing the coastline from Catherine Hill Bay to the Royal National Park. This comparison is presented below in Figure 2.4 from the Census data (ABS, 2011). The graph shows the suburb of Manly has a higher proportion of persons aged 30-39 and a lower proportion of those aged 10-19 in comparison to the Greater Sydney Average.

### 2.3.1 Pedestrian User Groups

Pedestrian planning considers a number of pedestrian facility user groups based on age and assumed capabilities. The groups are classified in the following age groups based on categories created by the ABS:

- Infants (ages 0-4)
- Pre-school (ages 5-8)
- Primary (ages 9-11)
- Secondary (ages 12-17)
- Young Adults (ages 18-25)
- Adults (aged 26-59)
  - Adults (a) from 26-39 years old
  - Adults (b) from 40-59 years old
- Elderly (aged 60+)
  - Elderly (a) from 60-69 years old
  - Elderly (b) 70+ years of age

The 2011 Census reported an Average of 2.2 persons per household and 1.2 motor vehicles per household in the study area. The census data shows that persons aged 0-9 years and the elderly (aged 60+) make up approximately 11% and 18% respectively of the total population in the suburb of Manly.



Source: Census data (ABS, 2011)

**Figure 2.4: Age distribution comparison of Manly and Greater Sydney**

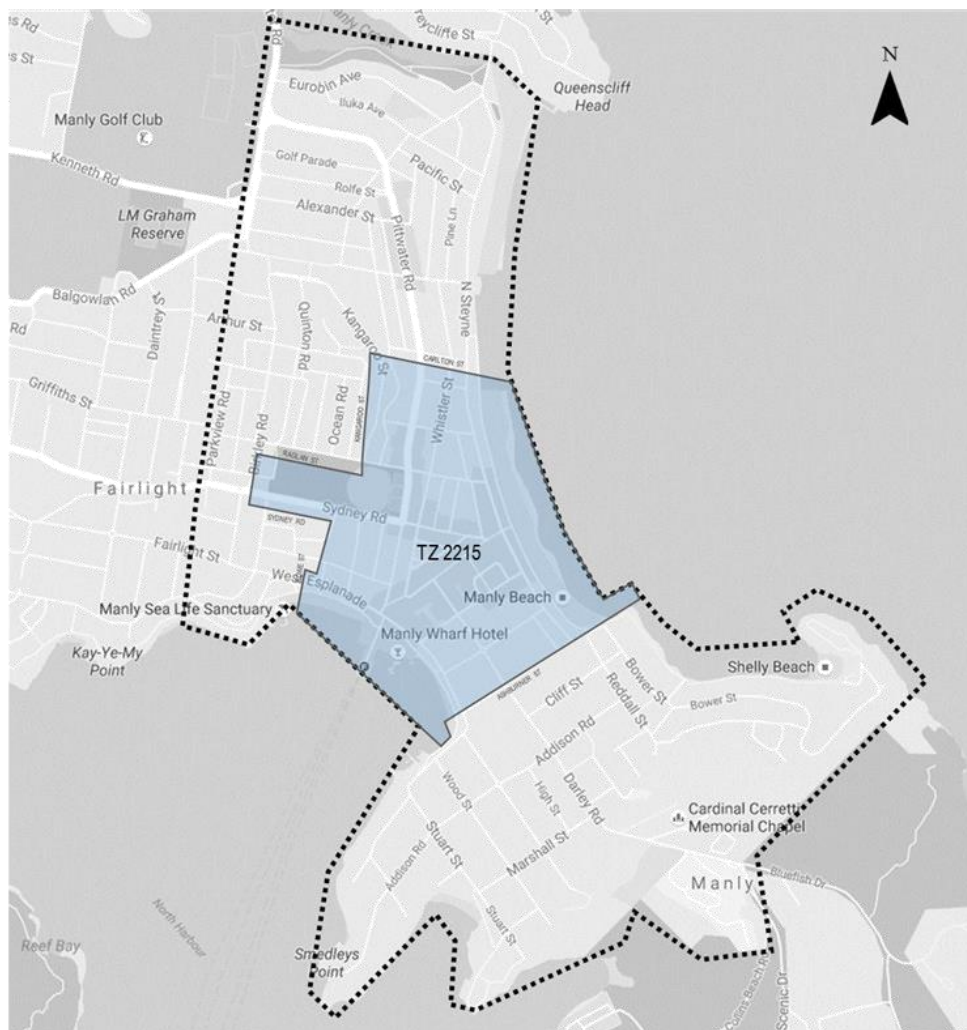
## 2.4 JOURNEY TO WORK

The NSW Bureau of Transport Statistics (BTS) 2011 Census Journey to Work (JTW) data provides an indication of popular origins, destinations, as well as the typical mode share for commuters moving from and into the study area.

Due to the existing travel zones used by the BTS, the study area was divided into two sections; the Manly Town Centre and the Wider Manly Area. Manly Beach, Manly Wharf, and Manly Town Centre are within the Travel Zone 2215 as shown in Figure 2.5, while the remainder of the study area is depicted in Figure 2.8. JTW data from the entire Manly suburb was analysed to obtain a more accurate understanding of the movements within the study area.



#### 2.4.1 JTW mode share in Manly Town Centre (TZ 2215)



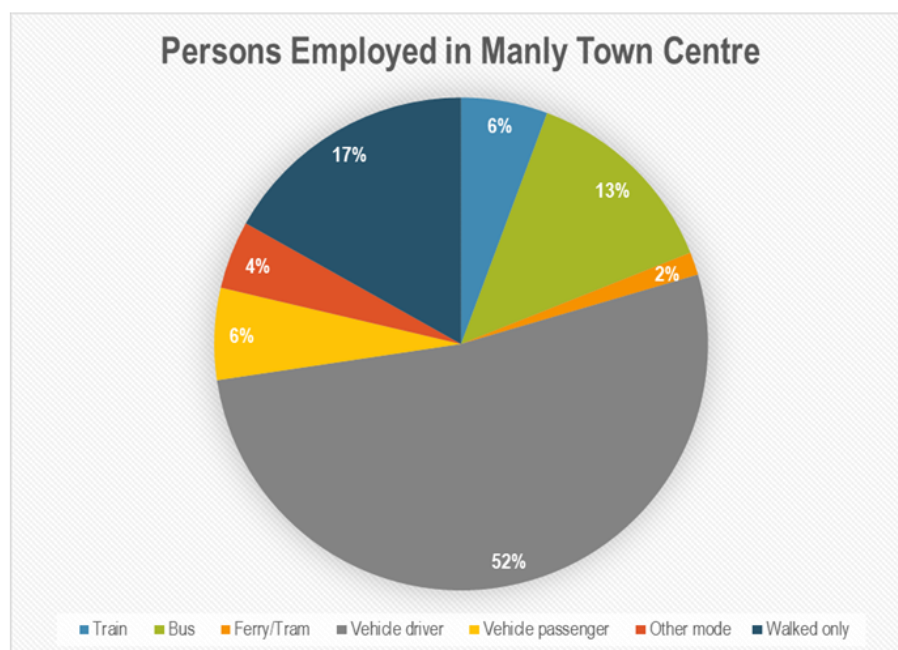
Source: Bureau of Transport Statistics – TZ 2215

**Figure 2.5: Manly Town Centre JTJW region**

##### **JTW mode to Manly Town Centre**

The Manly Town Centre is situated in the centre of the study area, which includes Manly Wharf. The area extends from Ashburner Street in the south, to Carlton Street in the north and includes up to Ivanhoe Park and Rowe Street in the West. This area is accessible by bus, ferry, and private car. Although there is no train access within Manly, the train can be accessed via private vehicle and bus with the closest train station located at North Sydney Station, which is 12km or 22-minute drive from the Manly Ferry Terminal.

Commuting by private vehicle, as either the vehicle driver or vehicle passenger, was 58% of mode share. Walking to work was prominent with 17% of commuters walking as their only mode of transport. Public transport combined to make up approximately 21% of daily travel to work trips including bus, train, or ferry. The mode share for workers travelling to Manly is shown in Figure 2.6.

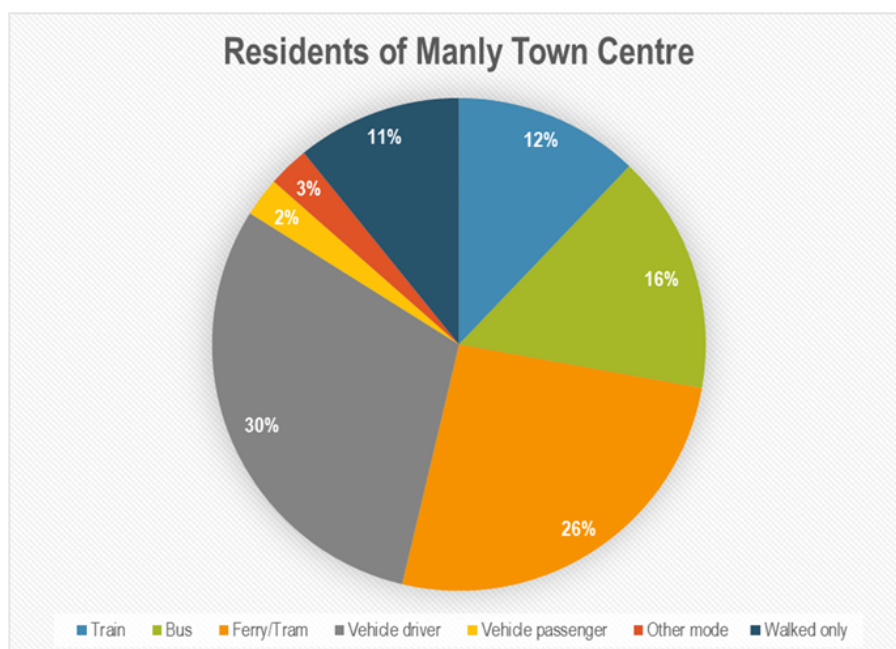


Source: Bureau of Transport Statistics – TZ 2215

**Figure 2.6: 2011 Journey to Work Mode Share – Persons employed in Manly Town Centre**

**JTW mode share from Manly Town Centre**

Commuting by public transport from the Manly Town Centre was the mode of transport to work with the highest share at more than half of mode share (54%). 11% of journeys from Manly Town Centre were walking to work and 32% of workers travelled by private car. The mode share for workers travelling to work from Manly Town Centre is shown in Figure 2.7.



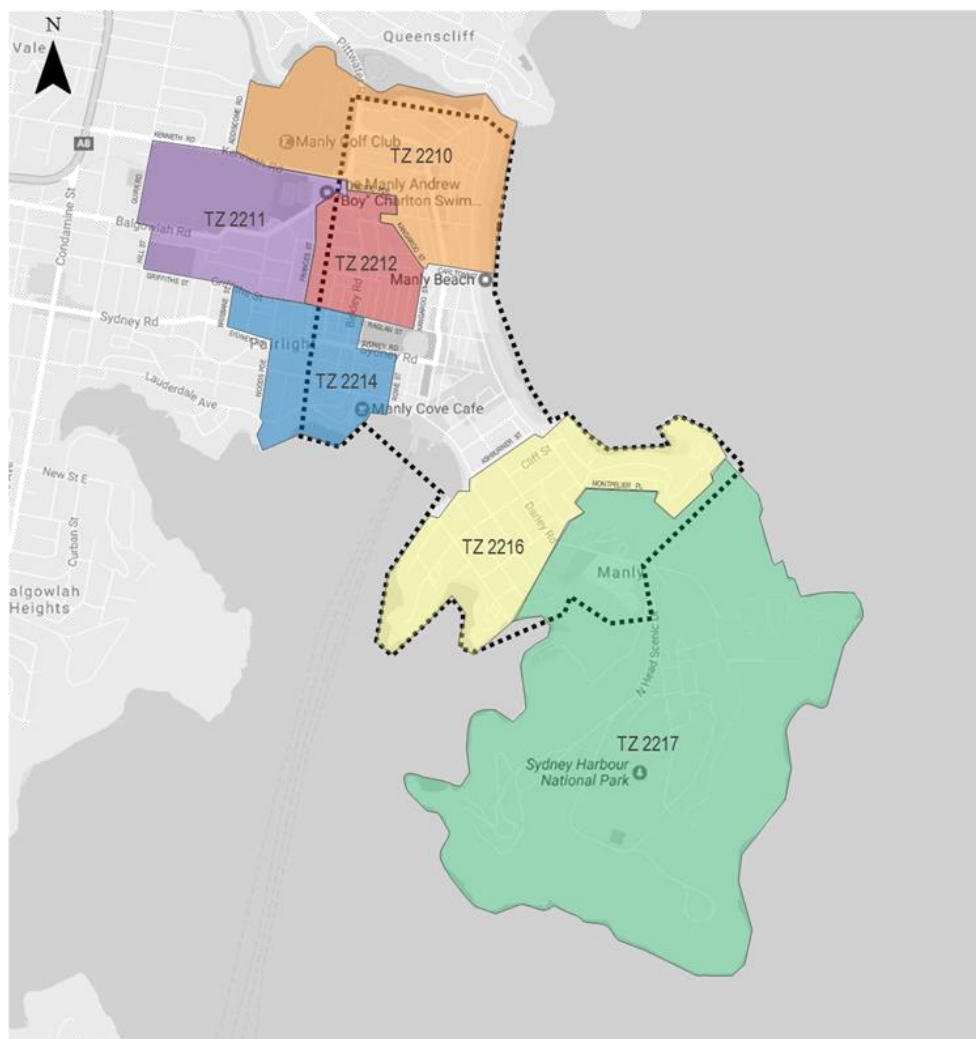
Source: Bureau of Transport Statistics – TZ 2215

**Figure 2.7: 2011 Journey to Work Mode Share – Residents of Manly Town Centre**

## 2.4.2 JTW mode share in the Wider Manly Area (TZ 2214, 2211, 2212, 2210, 2216 and 2217)

### *JTW mode share to the Wider Manly Area*

The Wider Manly Area in this study is bordered by Manly Creek in the North, along Pittwater Road in the West and to the hospital in the South. However, for the JTW analysis, data from the surrounding areas was considered due to the large number of residents travelling through Manly Town Centre from the surrounding areas, particularly from the south. The area used for the JTW analysis is shown in Figure 2.8.

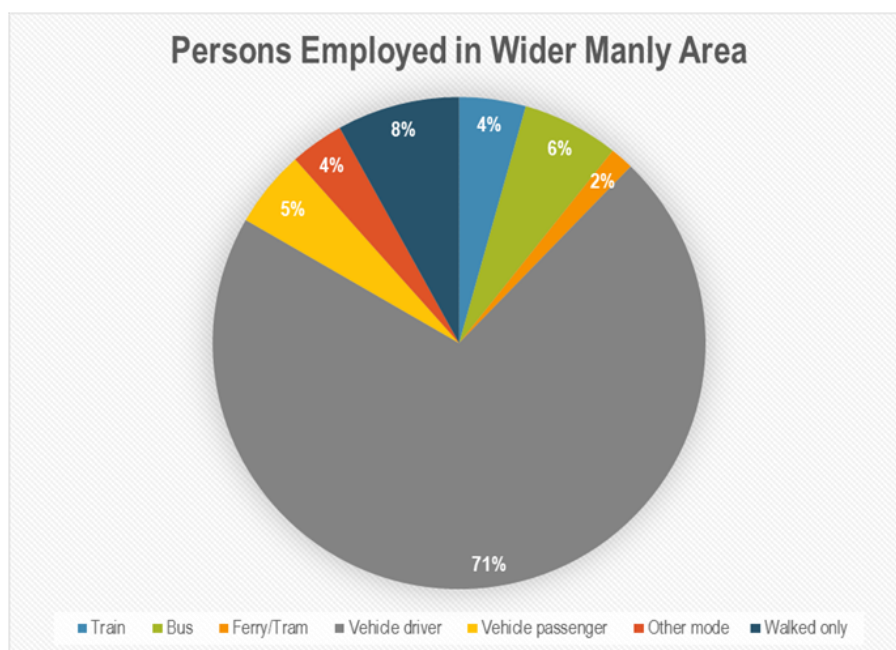


Source: Bureau of Transport Statistics – TZ 2214, 2211, 2212, 2210, 2216, 2217

**Figure 2.8: Wider Manly Area JTW region**

The mode of transport with the highest mode share for commuters travelling to the wider Manly Area was by private vehicle, as either a driver or passenger, accounting for 76% of trips. Public transport mode share was 12% of trips. The JTW mode share for persons employed within the wider Manly area is shown in Figure 2.9.



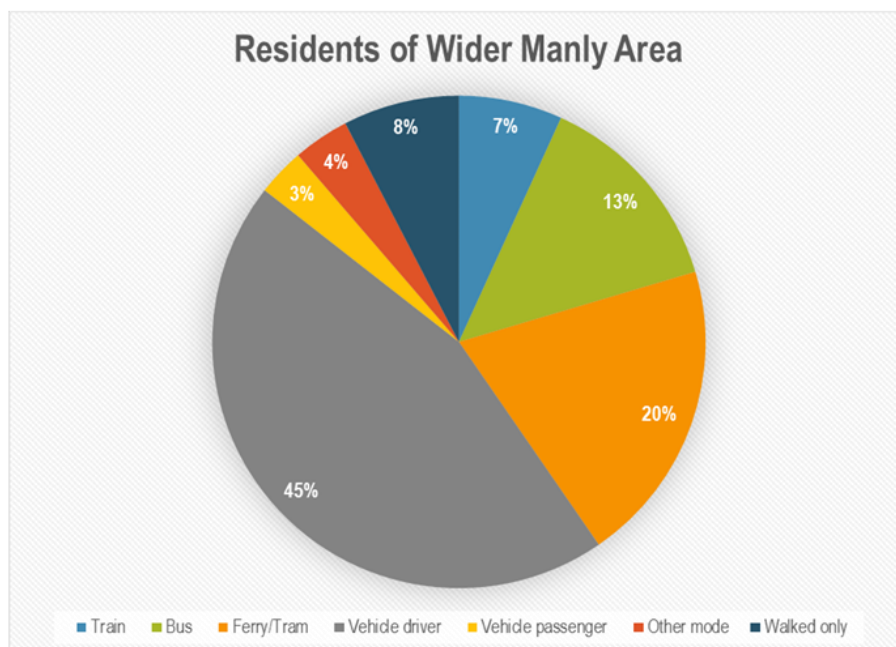


Source: Bureau of Transport Statistics – TZ 2214, 2211, 2212, 2210, 2216, 2217

**Figure 2.9: 2011 Journey to Work Mode Share – Persons employed in the Wider Manly Area**

#### *JTW mode share from the Wider Manly Area*

For residents travelling to work from the Wider Manly Area, the most prominent mode of travel to work was by private vehicles with 48% of trips made by either the driver or passenger of a private vehicle. Public transport was 40% in total. The JTW mode share for residents of the Wider Manly Area is shown in Figure 2.10.



Source: Bureau of Transport Statistics – TZ 2214, 2211, 2212, 2210, 2216, 2217

**Figure 2.10: 2011 Journey to Work Mode Share – Residents of the Wider Manly Area**

## 2.5 PLANNING FOR MOBILITY IMPAIRED PEDESTRIANS

Careful consideration is required when assessing the condition and future implementation of pedestrian facilities to ensure that the needs and requirements of all users are considered. The ability, for those less mobile, to access services and facilities such as public transport, medical facilities and, shopping centres is a vital component of assessing the level of service provided and designed for in pedestrian facilities. The benefits of considered design are not limited to mobility impaired pedestrians, as all lines of pedestrian transport including walking, running, and cycling are aided by thoughtfully planned pedestrian facilities. A lack of consideration in phases of the design process can result in a pedestrian network that excludes or reduces the ability of key user groups to use the facilities effectively.

Design codes and standards, such as the Building Codes of Australia (BCA) and Australian Standards, are stringently considering the needs of the less mobile and implementing requirements for new developments at an increased rate. The impending final implementation of the National Disability Insurance Scheme will allow for people with mobility impairment to increase their activities and movement in the community and, therefore, it is increasingly important that public and pedestrian facilities are designed and constructed accordingly. For this reason, it may be important in some instances for designs of new facilities to extend from the minimum required standards to better meet the surrounding conditions and built environment to cater for mobility impaired pedestrians and reduce the potential work and cost associated with retrofitting or removal and replacement of aspects of the pedestrian facilities.

Whilst it is not possible to provide pedestrian facilities that allow for all possible user groups to be catered for in all instances, it is necessary to ensure that the priority routes considered are suitable for the maximum number of people from all likely user groups. The Disability Discrimination Act 1992 (DDA) states that it is unlawful to disregard disability standards. Additionally, all new infrastructure is to meet updated Australian Standards, such as AS1428, and BCA that set out specific guidelines and requirements for physical access.

## 2.6 TRANSPORT FACILITIES

### 2.6.1 Existing Pedestrian Facilities

Pedestrian accessibility and safety for the maximum amount of user groups are the main targets of a successful PAMP. Consideration should be provided to users with restricted mobility, children, sensory and intellectual impairments and the elderly to ensure that facilities cater for safe and easy use and movement for all. Important factors that play a role in affecting pedestrian movement include:

- Vehicle movement and speeds;
- Notification and signposting of desired pedestrian paths;
- Condition and access of footpaths;
- Adequate crossing provisions (at midblock, roundabouts, intersections, signals etc.); and
- Lighting and other safety infrastructure.

Pedestrian access within the Manly Beach, Wharf and Town Centre is highly encouraged, where most attractors are accessible by walking. Generally, streets are lined with well-maintained footpaths and include signalised intersections, signalised mid-block crossings, and marked zebra crossings. Higher pedestrian priority streets including North Steyne, South Steyne, East Esplanade, and West Esplanade encourage pedestrian activity with quality footpaths and benches along the foreshore, and bike racks to promote cycling. Furthermore, major walking routes including The Corso and Market Place connect Manly Wharf to Manly Beach and direct pedestrians towards major attractors including shop fronts and restaurants within the Manly Town Centre.

Similarly, residential streets in the study area are mostly lined with footpaths on both sides of the road and have access to bus stops. Alternatively, North Steyne contains similar pedestrian facilities as that found in the Manly Town Centre. A shared path for pedestrians and cyclists follows North Steyne throughout the study area, bordering Manly Beach with benches installed throughout the walk. The residential side of



North Steyne includes portions of polished footpaths and sections of abutment paths. Bus stops on North Steyne consistently line both sides of the road.

## 2.6.2 Public Transport

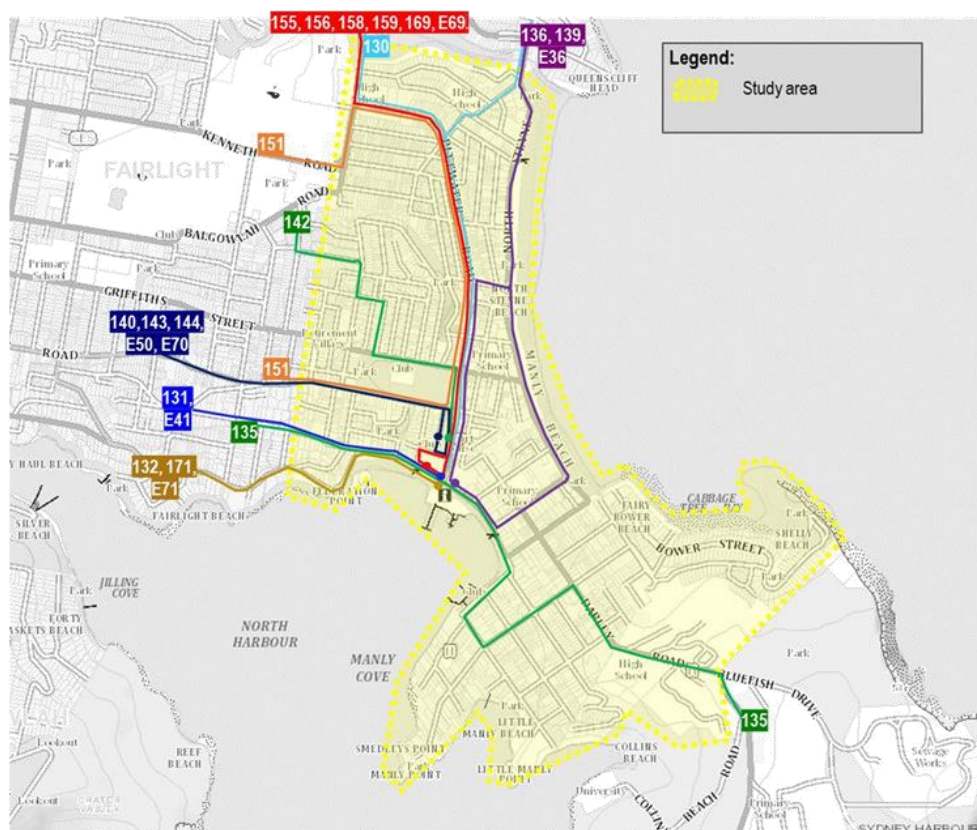
### Train

There is no train line through Manly LGA, so trains have no direct impact on the pedestrian activity of the study area. North Sydney Station is the closest at 12 kilometres (or 12 minutes' drive) from the Manly Ferry Terminal. Therefore, trains are not considered in the PAMP.

### Bus Services

The bus services connecting Manly to other areas of Sydney are provided by Sydney Buses. The bus services are shown below in Figure 2.11.

A summary of bus frequencies is provided in Appendix D.

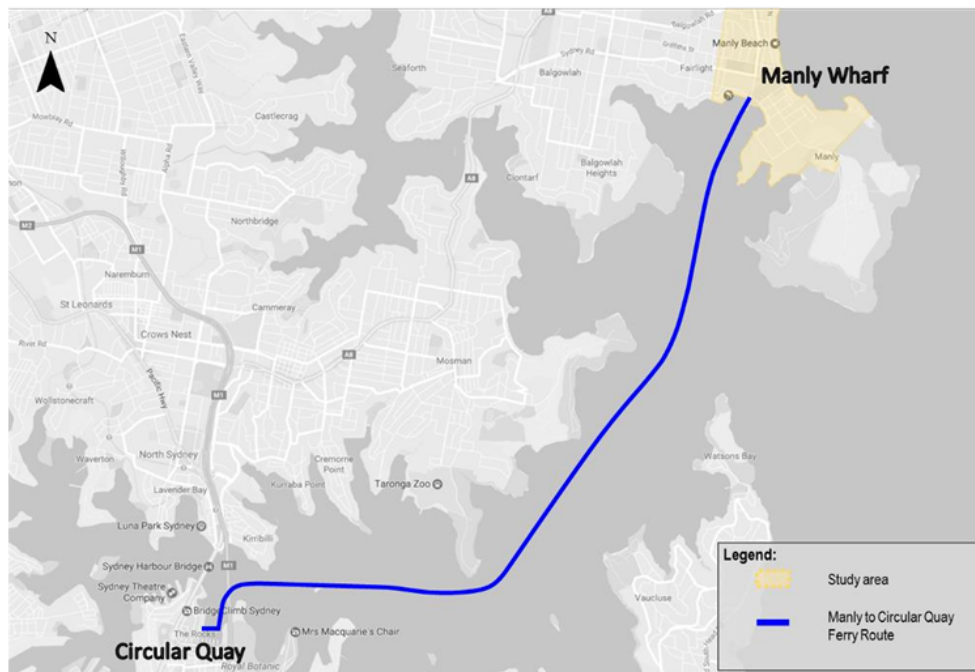


Source: Transportnsw.info and Google Maps

Figure 2.11: Bus Routes within the study area

## Ferry

The ferry services connect Manly to Circular Quay. Transport for NSW ferries run a regular service where each trip is approximately half an hour. Other ferry companies and water taxis have faster services too. The ferry route is shown below in Figure 2.12.



Source: Google Maps

Figure 2.12: Ferry route from Manly to Circular Quay (inbound and outbound)

## 2.6.3 Road Hierarchy

The road network in the Manly area primarily consists of an interconnected series of local roads, in line with the majority of the land use being classed as low and medium density residential development. There are two major metropolitan arterial routes, Sydney Road and Pittwater Road, which are responsible for providing a vital connection between the Manly suburb and surrounding areas.

Sydney Road is a state-owned road, where the Roads and Maritime Services (RMS) finance and manage the road. Sydney Road connects Manly to Northern Sydney, providing the most direct route via the A8 Manly Road, also a state-owned road, situated west of the study area. The route runs in an east-west orientation and is a two-way road with sections of four and six lanes along its length to Manly Road from the study area. From Manly Road, Sydney Road has a speed limit of 60 km/h both ways.

Similar to Sydney Road, Pittwater Road is also a state-owned road and forms the A8 in the North. The route is the primary north-south road and bisects the northern zone of the study area. It extends for approximately 3.8 kilometres from the A8 to Belgrave Street, of which 1.5 kilometres is within the study area. The maximum speed limit throughout the route is 60 km/h, with one 40 km/h school zone located at the Pittwater Road / Balgowlah Road intersection.

Darley Road, within the study area, connects the southern zone, particularly Manly Hospital, to the Manly Town Centre and ultimately, to Greater Sydney via Sydney Road and Manly Road. Darley Road is a two-way, two-lane, local road. It has a combination of 40 and 50 km/h zones, and incorporates two 40 km/h school zones located at Marshall Street and Victoria Parade.

A summary of road classifications within the study area is shown below, in Table 2.1.

**Table 2.1: Road Classifications**

Classification	Identified Roads
State Road	Belgrave Street Sydney Road Pittwater Road
Regional Road	North Steyne Raglan Street Commonwealth Parade West Esplanade The Crescent
Local Road	All other roads

Source: Roads and Maritime Services (RMS), Schedule of Classified Roads and Unclassified Roads

The traffic volumes along the A8 that are relevant to the study area are captured from 210 metres south of Manly Road at Spit Road. Spit Road is considered the main arterial road used by vehicles travelling to and from the south of the study area. Traffic flows along Spit Road are shown below in Table 2.2.

**Table 2.2: Average Daily Traffic Volumes along State Road A8**

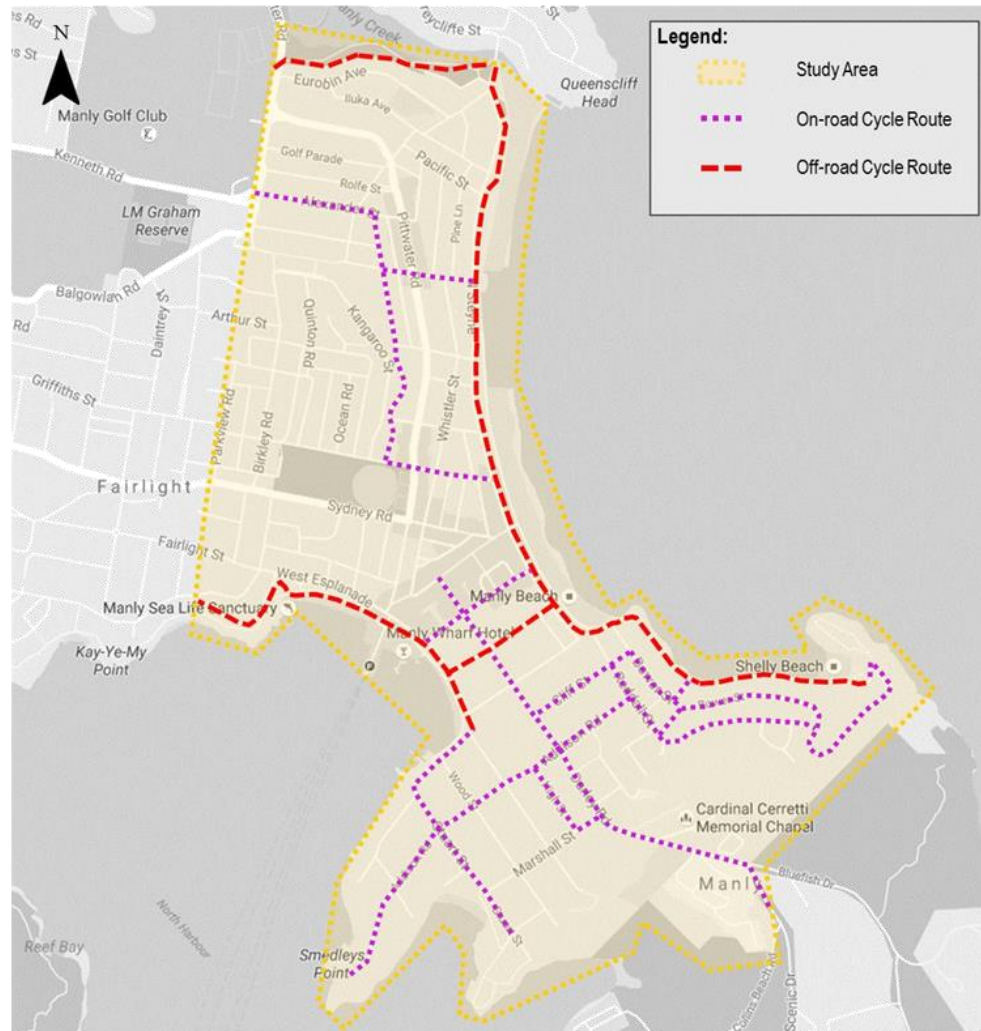
Location	Station ID	Direction	AADT		
			All Days	Weekdays	Weekends
Spit Road	34001	Northbound	32828	34422	29118
		Southbound	30521	32077	26583

Source: RMS Annual Average Daily Traffic (AADT) Data 2016

\*Most recent AADT data obtained in 2013

#### 2.6.4 Cycling Routes

Cycling routes within the study area are designed for recreational activities as well as to promote cycling as a method of transportation. Using information supplied on the Northern Beaches Council website, a map of the main cycle routes is shown below in Figure 2.13.



Source: Manly Council – Manly Bike Network, Google Maps

**Figure 2.13: Cycling routes within the study area**

It should be noted that routes considered off-road in the above figure mainly consist of shared paths or a separated bicycle lane.



### 3. RESEARCH, REVIEW AND DATA COLLECTION

#### 3.1 LITERATURE REVIEW

##### 3.1.1 Australian Government Department of Infrastructure and Regional Development 2015, *Pedestrians and Road Safety*

*Pedestrians and Road Safety* provides a statistical overview of the crashes involving pedestrians over time in Australia to establish and monitor trends to assist in future planning to reduce incidents. The key statistics and trends identified are as follows:

- From 1995 to 2014 there has been a 62% reduction in pedestrian fatalities across Australia;
- NSW has the highest number of pedestrian fatalities and the second highest per capita pedestrian fatality rate (per 100,000 people) between 2005-2014;
- Pedestrians over 75 are heavily over represented in statistics for pedestrian injuries and fatalities;
- Male pedestrians are twice as likely to be fatally injured in road crashes for all ages except 65+;
- Cities have higher numbers of crashes involving pedestrians but lower crash rates per capita;
- 60% of fatalities occur at 50 or 60 km/h posted speed limit zones, with the lowest rate of fatality incurring where posted speed limits are between 0 and 40 km/h;
- The peak times for crashes involving pedestrians are 6pm to 9pm on weekdays and 12am to 3am on weekends;
- From 2009 to 2013, pedestrians have been 2.5 times more likely to be involved in a fatal crash at non-intersection locations when compared to intersection crashes; and
- Alcohol, drug, and mobile device use of pedestrians has not been included in the data collection.

**PAMP Implications:** The key statistics outlined above provide clear areas that must be addressed by any PAMP to ensure that people, locations, and times of day that experience heightened levels of crashes are addressed, in order to reduce the likelihood of further incidents.

##### 3.1.2 Premier's Council for Active Living NSW 2010, *Development and Active Living – Designing Places for Active Living*

*Development and Active Living – Designing Places for Active Living* outlines the role that new developments play in supporting and encouraging modes of transport that involve physical activity. By integrating the principles of active living into a proposed development, pedestrian movement is encouraged, which benefits the development and surrounding area. The five principles of active living as set out by the New South Wales Government are:

- Walkability and Connectivity: providing easy, attractive and accessible routes for pedestrians to take between pedestrian generators;
- Active Travel Alternatives: viable transport options to and from the development aside from vehicle use should be promoted and integrated into any design;
- Legibility: the ability of the surrounding environment to inform pedestrians of their location and possible destinations utilising existing facilities;
- Quality Public Domain: providing an environment that is attractive and has a high level of service and priority for pedestrians; and
- Social Interaction and Inclusion: promote and provide facilities that supply opportunities for a diverse range of people, including all ages, ethnicities, and activity levels, to engage in the environment physically.

**PAMP Implications:** The PAMP outcomes will remain consistent with the principles set out by the New South Wales Government in attempting to reduce the reliance on vehicles in town centres by increasing the attractiveness of travelling by means of physical activity. Connectivity, inclusion, alternatives, quality, and legibility are all key components of the desired outcomes.

### 3.1.3 Transport for NSW 2012, *Disability Action Plan 2012-2017*

*Disability Action Plan 2012-2017* prioritises the accessibility of transport facilities to ensure the services can be utilised by as many people as possible. As a result, there is a focus on the facilities provided to pedestrians on their journey to and from public transport to enable access by all user groups. Transport for NSW has dedicated programs that provide funding for the installation of pedestrian facilities that have the potential to be heavily utilised by pedestrians and cyclists, and will improve overall accessibility and safety of journeys to transport facilities.

**PAMP Implications:** The PAMP is able to evaluate certain recommendations and assess whether there is reason to apply to Transport for NSW to fund some of the work identified in this PAMP.

### 3.1.4 *Manly Development Control Plan 2013*

The *Manly Development Control Plan 2013* (or, DCP) aims to ensure that developments contribute to the quality of the natural and built environment, while considering economic, social, and environmental sustainable principles. It promotes the inclusion of all members of the community in future developments and positively impacts the Manly heritage and character of the area.

Of relevance to the study are the sections dealing with:

- Heritage Considerations – Alterations or additions to heritage items or conservation areas (3.2.2)
- Accessibility (3.6)
- Development in Business Centres – Manly Town Centre and surrounds (4.2.5),
- Neighbourhood Centres (4.2.8)
- Manly Town Centre Heritage Conservation Area and The Corso Heritage Item (5.1)
- Pittwater Road Conservation Area (5.2)

**PAMP Implications:** The DCP should be considered by the PAMP when composing recommendations to ensure outcomes correlate feasibly with the objectives outlined in the plan. Particularly, is the aim to improve and identify the direct, safe, and accessible routes for pedestrians to, from, and around Manly. Other considerations of note include Heritage items and conservation areas.

### 3.1.5 *Manly Local Environmental Plan 2013*

The *Manly Local Environmental Plan 2013* (or, LEP) by the former Manly Council provides a framework for the development of land within Manly. The LEP aims to support ecologically sustainable development, that is, development that improves quality of life while maintaining vital ecological processes. The objectives of the plan are to ensure the social needs of residents are met and to promote safe and sustainable access opportunities. It promotes a high standard of urban design, specifying the types of land use developments acceptable, as well as its densities and heights.

The study area is a combination of low and medium density residential zones, as well as retail and commercial sections, and public and private recreation areas. The Manly LEP aims to increase accessibility, reduce private car dependency, and increase use of public transport, particularly by concentrating trip-generating activities in locations where public transport is accessible.

**PAMP Implications:** To provide adequate and acceptable solutions, the Manly LEP should be used as a guideline for the betterment of pedestrians in a social, physical, and sustainable context. The existing environment and land use of Manly form an important component when assessing and delivering recommendations.

### 3.1.6 *Manly Council Community Strategic Plan Beyond 2025*

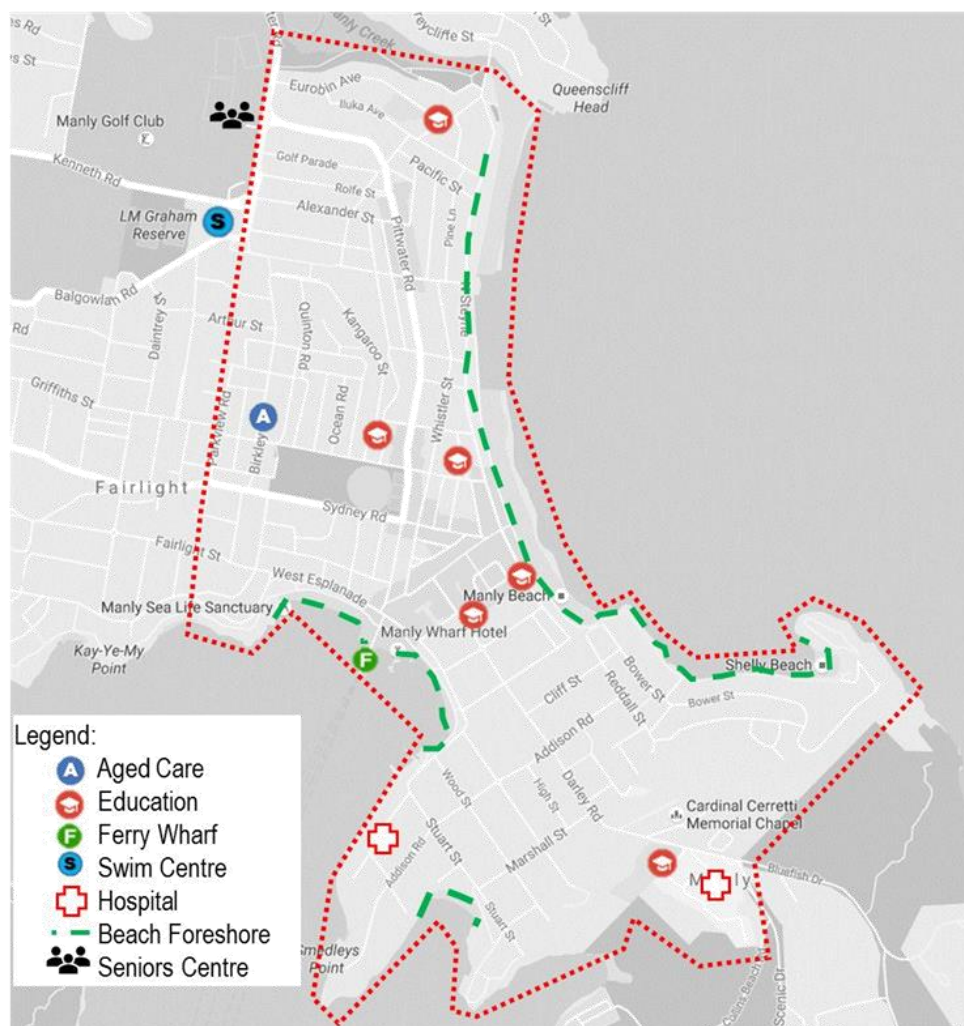
The *Community Strategic Plan Beyond 2025* is the latest community strategic plan, and was prepared prior to the amalgamation of NSW local councils, which occurred in late 2016 to early 2017. As the newly formed Northern Beaches Council is yet to hold elections, no such document for the newly formed council exists. As such, for the purpose for conducting the PAMP, the *Manly Community Strategic Plan Beyond 2025* will be utilised.

The plan provides future directions for the Manly community that represent the aspirations of the people who live, visit, and work in the Manly area. The plan identifies the need to improve and maintain amenities and infrastructure services in Manly.

**PAMP Implications:** The PAMP will provide guidance and direction for the development of the future Manly Community Strategic Plan Beyond 2027.

### 3.2 KEY PEDESTRIAN GENERATORS AND ATTRACTORS

The greatest generators of pedestrian movement within the study area are Manly Wharf and Manly Beach, located on the western and eastern side of the Manly Town Centre, respectively. The Town Centre is also a significant attractor of tourists and residents, where land use is predominately commercial and retail throughout the area. There is a small amount of public infrastructure within the Manly Town Centre, such as the Manly Library, churches, the Manly Village Public School and the Royal Far West School, all of which generate significant pedestrian activity. Furthermore, a shared path and pedestrian path is located along the eastern side of North Steyne and South Steyne, where the pedestrian path is closest to the beach and the shared path is along the road. Another shared path is located along the East Esplanade and West Esplanade, near the Manly Wharf. These shared and pedestrian paths along the waterfronts of the Manly Beach and the Manly Wharf are major trip generators for pedestrians and cyclists. Figure 3.1 outlines the key pedestrian generators and attractors considered in the study.



Source: Google Maps

Figure 3.1: Map of Key Pedestrian Generators and Attractors



Attractions in the Wider Manly Area include the Manly Hospital, located in the Southern Zone of the study area surrounded by environmental conservation sites and the Sydney Harbour National Park. Additionally, other public recreation zones including Shelley Beach, Little Manly Cove, and the Sydney Harbour National Park attract both tourists and residents. The majority of the remaining area in the Southern section of the study area is low density residential, while the Northern section of the study area is predominately medium density residential uses.

### 3.3 PEDESTRIAN RELATED CRASH DATA

Crash data was sourced from the Transport for New South Wales Centre for Road Safety. It shows 45 incidents involving pedestrians were reported between 2010 and 2015.

The crash data shows 45 casualties, over a period of 5 years, were reported; this includes two fatalities. Table 3.1 below illustrates the number of casualties reported at the locations of pedestrian crashes within the study area. A full list of pedestrian related crashed can be found in Appendix C.

**Table 3.1: Crash Casualties between 2010-2015**

Road name	Casualties						Total
	2010	2011	2012	2013	2014	2015	
Addison Road						2	2
Augusta Lane						1	1
Belgrave Street	1	4	1	2	2	2	12
Central Avenue				1			1
Collingwood Street				1			1
East Esplanade	1		1				2
Eurobin Avenue	1						1
Fairlight Street						1	1
Francis Lane				1			1
North Steyne		1		1	1	1	4
Osborne Road				1			1
Pittwater Road	2	5	1		2		10
Raglan Street			1				1
South Steyne	1	1					2
Sydney Road	1						1
Wentworth Street			1				1
West Esplanade			1		1		2
Whistler Street					1		1
<b>Total</b>	<b>7</b>	<b>11</b>	<b>6</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>45</b>

Key outcomes from the crash data analysis involving pedestrians as shown above include:

- Of the 45 crashes that were reported during a 5-year period, 43 resulted in injury (96%) and two fatalities were observed.
- From 2010 to 2015, pedestrian crashes averaged 8 crashes per year;
- The data recorded 32 crashes (70%), involving casualties, occurred during the day;
- Of the 45 reported crashes, 37% were at intersections. The intersections involved were as follows:
  - Bridge Road and Cameron Ave;
  - Pittwater Road and Pine Street;
  - Pittwater Road and Raglan Street;
  - Belgrave Street and Sydney Road;
  - Belgrave Street and Gilbert Ave;
  - West Esplanade and Belgrave Street;
  - West Esplanade and Rowe Street;
  - East Esplanade and Wentworth Street;
  - Darley Road and Addison Road;
  - Commonwealth Parade and Fairlight Street;
  - Raglan Street and Augusta Lane; and
  - North Steyne and Denison Street;
- The sections of Belgrave Street and Pittwater Road included in the study area incurred the highest number of pedestrian crashes, with 12 (27%) and 10 (22%) crashes respectively.
- The majority of pedestrian crashes were near side and far side road incidents, equating to 42% and 30% of crashes, respectively.

To supplement the crash data a map, detailing the available pedestrian and cycling facilities can be seen in Figure 3.2. Areas marked as "no cycling" indicate a section of footpath where cycling is specifically prohibited at all times, whereas "no cycling (specific times)" indicates a shared path with restrictions on cycling between hours specified on signage.

Further to this, maps detailing locations of crashes involving pedestrians can be seen in Figure 3.3 and Figure 3.4.

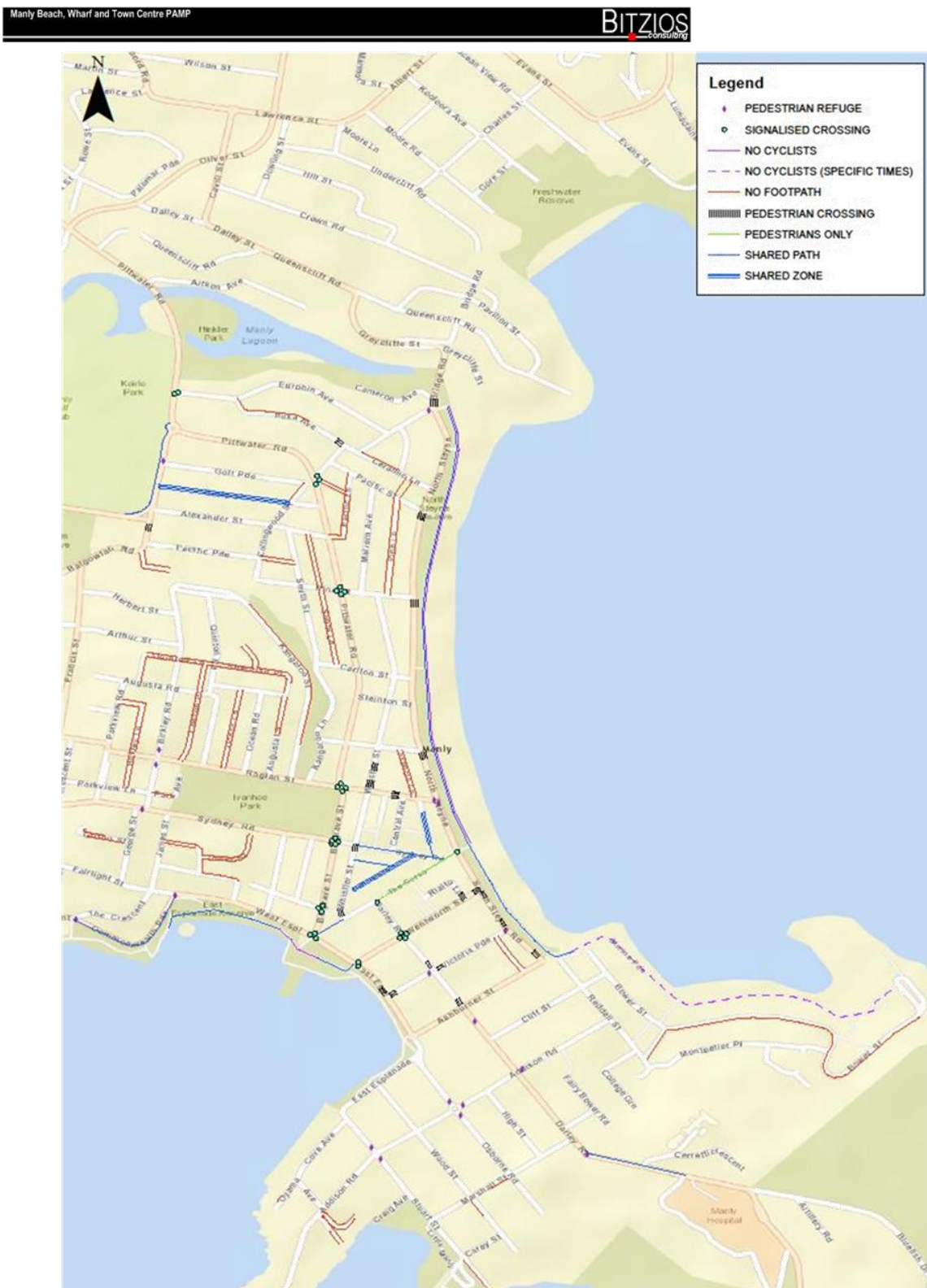
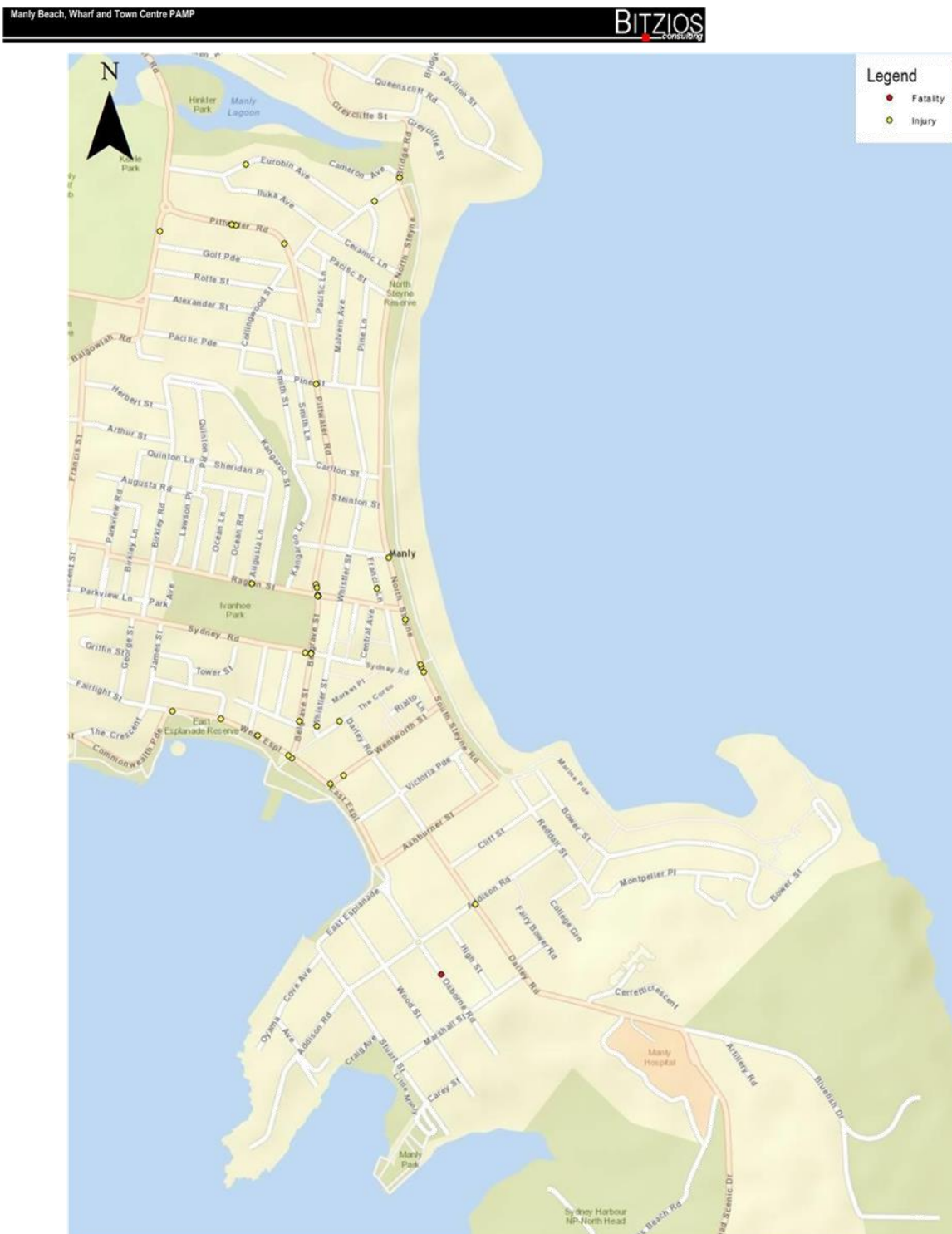


Figure 3.2: Pedestrian Facilities in Study Area





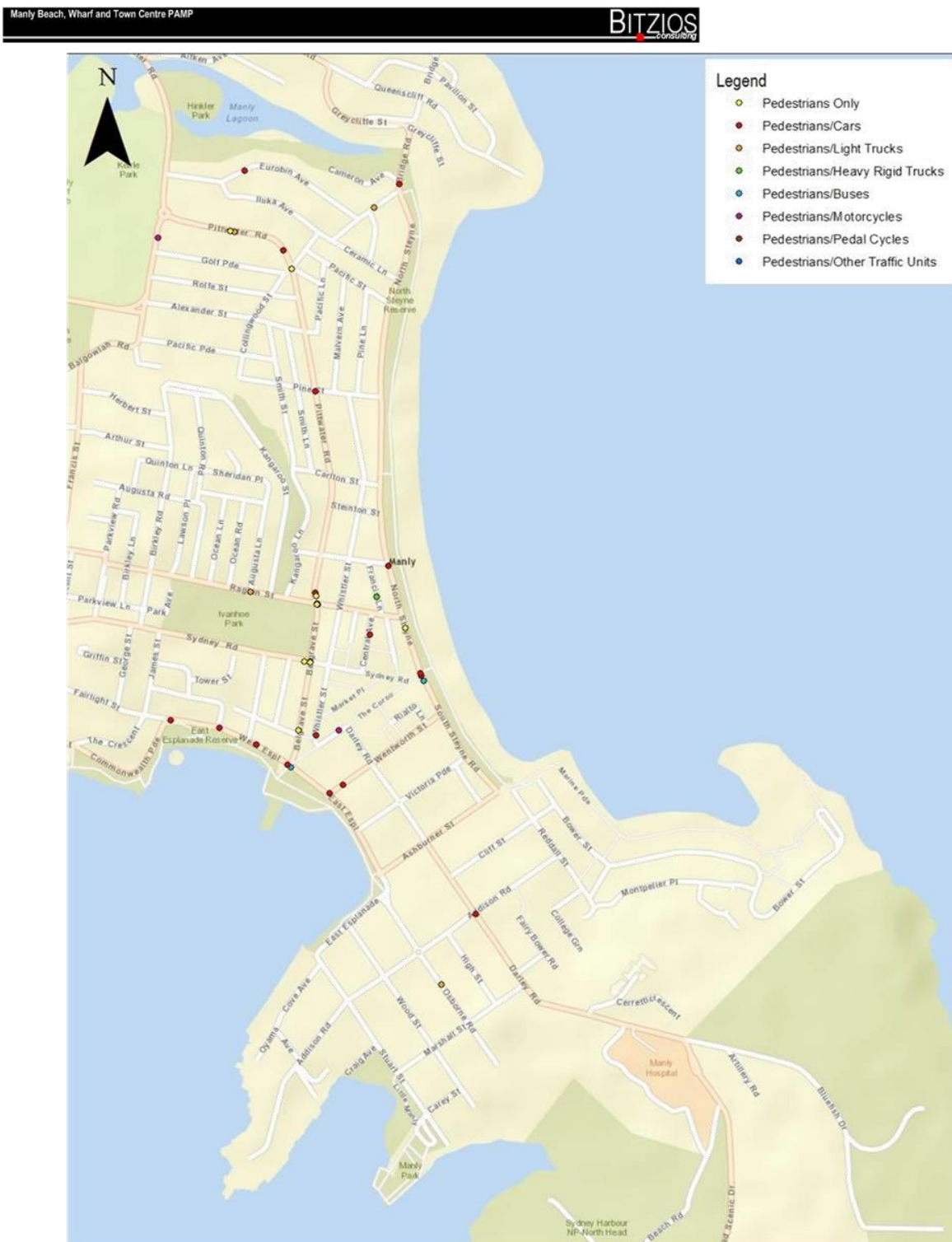


Figure 3.4: Pedestrian Crashes by Vehicle Type

### 3.4 TRAFFIC COUNT DATA

Traffic data was supplied by Northern Beaches Council for the use in the PAMP. This data was supplemented by data from a previous PAMP conducted by Bitzios Consulting on Pittwater Road. The list of count data locations is as follows:

- Data supplied by Northern Beaches Council (from March 2015)
  - Pacific Parade (between Balgowlah Road and Smith Street)
  - Alexander Street (between Balgowlah Road and Pittwater Road)
  - Rolfe Street (between Balgowlah Road and Pittwater Road)
  - Golf Parade (between Balgowlah Road and Smith Street)
  - Collingwood Street (between Pine Street and Golf Parade)
  - Addison Road (between Manly Point and Reddall Street)
  - West Esplanade (between Fairlight Street and Belgrave Street)
  - Commonwealth Parade (between The Crescent and West Esplanade)
- Data from Bitzios Consulting Pittwater PAMP (data from 2011 to 2014)
  - Cohen Street- Adjacent. Number 6
  - New Street West- Adjacent. Number 20
  - Waratah Street - Adjacent. Number 16
  - Balgowlah Parade- 17m north of Golf Parade
  - Scales Parade - Adjacent. Number. 10
  - Balgowlah Road West (Daintrey Street)
  - Balgowlah Road (outside 29-31)
  - Balgowlah Road East (Francis Street)
  - Eurobin Avenue (exact location unknown)
  - Kenneth Road West (just past Pool driveway)
  - Kenneth Road (Pedestrian Refuge)
  - Kenneth Road East (west of Balgowlah Road)
  - Eurobin Avenue (outside 25)

Of the locations listed above, Scales Parade, Waratah Street, Cohen Street, and the pedestrian counts on Balgowlah and Kenneth Road were outside the Study Area.

In addition to the data provided above Bitzios Consulting undertook a traffic count during a site visit. The traffic counts conducted by Bitzios Consulting can be found in Appendix B. The site visit was conducted on the 17 February 2017, between 1:00pm and 2:00pm. Pedestrian spot counts were undertaken for the following locations:

- Intersection of Carlton Street and Pittwater Road;
- Intersection of Denison Street and Pittwater Road; and
- Harris Farm, Pittwater Road;

These counts were used to identify the existing traffic flow behaviour and pedestrian volumes, which were used to assess pedestrian crossing infrastructure warrants.

More information on the count data is provided in Appendix B.

## 4. PEDESTRIAN ACCESS AND MANAGEMENT PLAN ROUTES

### 4.1 PRIORITY ROUTE SELECTION

For the purposes of the PAMP, a pedestrian route was considered to be a path travelled by a pedestrian from a pedestrian generator to a pedestrian attractor. An example being a footpath on a street, travelling from a residential area to the Manly Beach.

The PAMP routes were initially selected based on the following criteria:

- proximity to pedestrian trip attractors and generators (such as a major bus interchange and shopping centre);
- location of pedestrian crashes;
- concerns from community feedback; and
- relationship to road hierarchy: routes that were closer to major roads, such as Pittwater Road, Sydney Road or Darley Road and the foreshore.

### 4.2 ROUTE PRIORITY

A priority route is a route that has been ranked as being of a higher priority than the other routes identified in the study.

The PAMP routes were ranked as either high, medium, or low based on similar criteria used for selecting the routes. Higher priority was given to routes within the town centre and key pedestrian links to public transport, schools, and aged care facilities. The route prioritisation system is shown in Table 4.1.

**Table 4.1: PAMP Route Priority System**

Criteria	Local Town Centre	Local Residential Area
Primary link to pedestrian attractors/ generators	High	High
Secondary link to pedestrian attractors/ generators	Medium	Low
Location of pedestrian crashes	High	Medium
Concerns from community feedback	High	Medium
Relation to road hierarchy	High	Medium
Links with existing vulnerable road user plans	High	Medium

By implementing the route prioritisation system, a number of routes were identified in the Study Area. The priority routes are presented in Figure 4.1 and Figure 4.2.

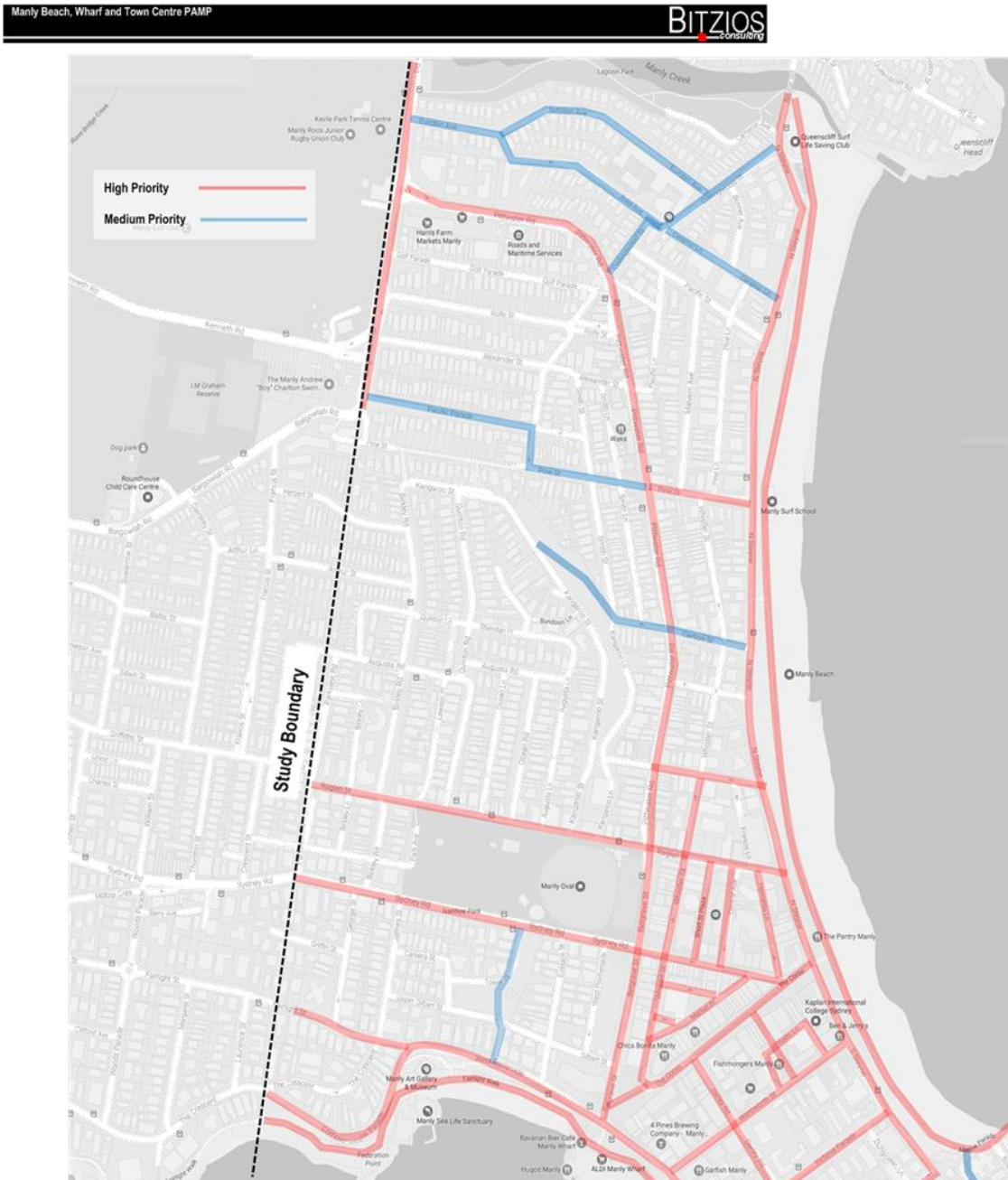


Figure 4.1: Priority Routes Selected for the Study Area (upper section)



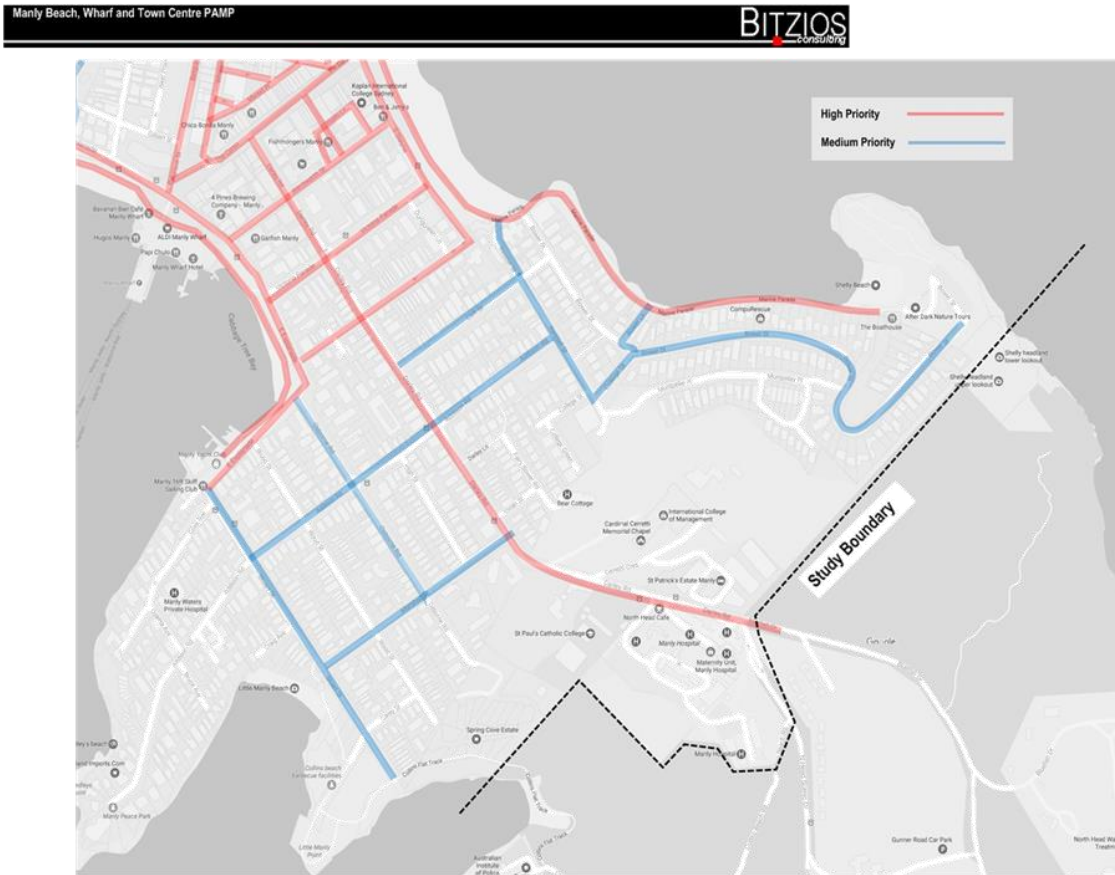


Figure 4.2: Priority Routes Selected for the Study Area (lower section)

All roads not highlighted in the above figure were considered to be low priority and were not assessed.

#### 4.3 INITIAL SITE VISIT AND OBSERVATIONS

The identified priority routes were audited in accordance with the *Roads and Maritime Services' methodology*, considering the Five C's as follows:

- Connected;
- Comfortable;
- Convenient;
- Convivial; and
- Conspicuous.

##### 4.3.1 Route Audit Process

A site visit was conducted on Friday 13 January 2017 and the days that followed and an audit of the pedestrian network was undertaken. An audit checklist was developed to assess any deficiencies in the previously identified priority routes. Deficiencies were based on the '5C' criteria, which includes:

- **Connectivity** – is the route connected to the rest of the network?
- **Comfort** – is the route well maintained, smooth, and unobstructed? Is the route attractive and free from excessive traffic noise?
- **Convenience** – are there adequate crossing opportunities? Are key destinations walking distance from one another?
- **Conviviality** – how pleasant is the walking environment?
- **Conspicuousness** – are the walking routes clearly lit and easy to follow?

A checklist was developed for each issue as follows:

Criteria	Check (Yes or No)
<b>Footpaths</b>	
Is the surface treatment consistent?	
Is the pavement width according to standards?	
Is the pavement uneven or cracked?	
Are there any obstructions?	
Is it a shared path?	
Is there clear signage?	
Slippery surface?	
Drainage?	
Is the cross fall compliant with standards?	
<b>Kerb ramps and crossings:</b>	
What type of crossing exists?	
Is there sufficient pedestrian green time?	
Is there sufficient visibility of the intersection?	
Are kerb ramps designed according to standard?	
What are the approaching vehicle speeds?	
Are there any other environmental factors?	

#### 4.3.2 General Audit Findings

The general findings of the PAMP audit were as follows:

- The audit of the PAMP routes showed that pedestrian facilities are, in general, functional with a large quantity of minor deficiencies that may hinder movement or create difficulty for less mobile pedestrians or parents with prams.
- More than 2,100 locations were found to have some level of impairment to pedestrian movement.
- Approximately 3.3 percent of the issues identified having a high-level priority to repair or alter.
- The condition of pedestrian facilities close to the pedestrian malls, such as The Corso, were of the highest standard whilst facilities along connecting routes, routes that connect high pedestrian use areas to generators and attractors, were of reduced quality.
- Shared path linemarking was very poor across all areas audited.

The roads that were observed to have the greatest rates of deficiencies were the footpaths along the eastern end of East Esplanade, Sydney Road, and Darley Road.

#### 4.3.3 Trip Hazard Audit Findings

Deficiencies in footpaths that may lead to pedestrians tripping over were the most common issue found during the audit of along all routes, accounting for 68 percent of all issues. Of the issues found cracked and/or uneven footpaths were the most prevalent. Examples of identified issues include:

- Raised Edges of footpath sections;
- Cracked, uneven or broken footpaths, arising from issues such as:
  - Service covers; and
  - Old or deteriorated footpath segments.
- Patch work from previous repairs or works; and
- Missing pavers.

Figure 4.3 shows an example of a trip hazard, which is a foot-sized hole in the pavement. This hazard and other similar may lead to injury.



Reference: N108 North of Carlton Street

**Figure 4.3: North Steyne - Hole in Pavement**

Shown in Figure 4.4 is an example of uneven and missing pavers. A hazard such as this may lead to a pedestrian tripping, in this case potentially falling into the roadway.



Reference: NS108 North of Wentworth Street

**Figure 4.4: Darley Road - Missing and Damaged Pavers near Kerb Ramp**

#### 4.3.4 Kerb Ramp Audit Findings

Kerb ramps are key to enable pedestrians' movement between footpaths and in and out of conflict across and on roadways. In many instances, issues relating to alignment, angle or lack of kerb ramp would reduce the effectiveness and hinder use of pedestrian facilities. Kerb ramp issues accounted for 8 percent of all issues identified. A large amount of the footpaths observed in the Manly study area contained kerb ramps that, although functional for able pedestrian users, may be considered hazardous to or potentially restrict the movement of mobility impaired pedestrians. Examples of kerb ramp issues identified during the audit included:

- Poor kerb ramp alignment;
- Steep kerb ramps;
- Cracked kerb ramps; and
- Raised lip on kerb ramps.



The example shown in Figure 4.5 is of a kerb ramp with ponding, ponding being the build-up of water, which may lead to pedestrians slipping and falling. The picture also shows an unconnected kerb ramp, which is when the kerb ramp has no kerb ramp on the other side of the road.



Reference WHS 74 South of Sydney Road

**Figure 4.5: Whistler Street - Unconnected Kerb Ramp and Ponding**

Shown below in Figure 4.6 is an example of an unaligned kerb ramp. An unaligned kerb ramp is a kerb ramp that does not line up with a kerb ramp on the opposite side of the intersection. As indicated by the arrows in the figure this kerb ramp in particular points a user towards the adjacent road.



Reference: NS84 South of Collingwood Street

**Figure 4.6: North Steyne - Unaligned Kerb Ramp**

#### 4.3.5 Parking Audit Findings

Deficiencies identified in the layout and configuration of parking spaces in most instances, related to mobility impaired parking and compliance issues or access to mobility impaired parking space. Parking issues accounted for less than 1 percent of all issues identified. Other issues identified related to:

- The layout of parking spaces; and
- Poor access.

Shown in Figure 4.7 is an example of a non-compliant parking space. The space shown in the example has no shared area as defined in AS2890.6.



Reference FW25 West of Rowe Street

**Figure 4.7: Fairlight Walk - Non-Compliant Mobility Impaired Parking**

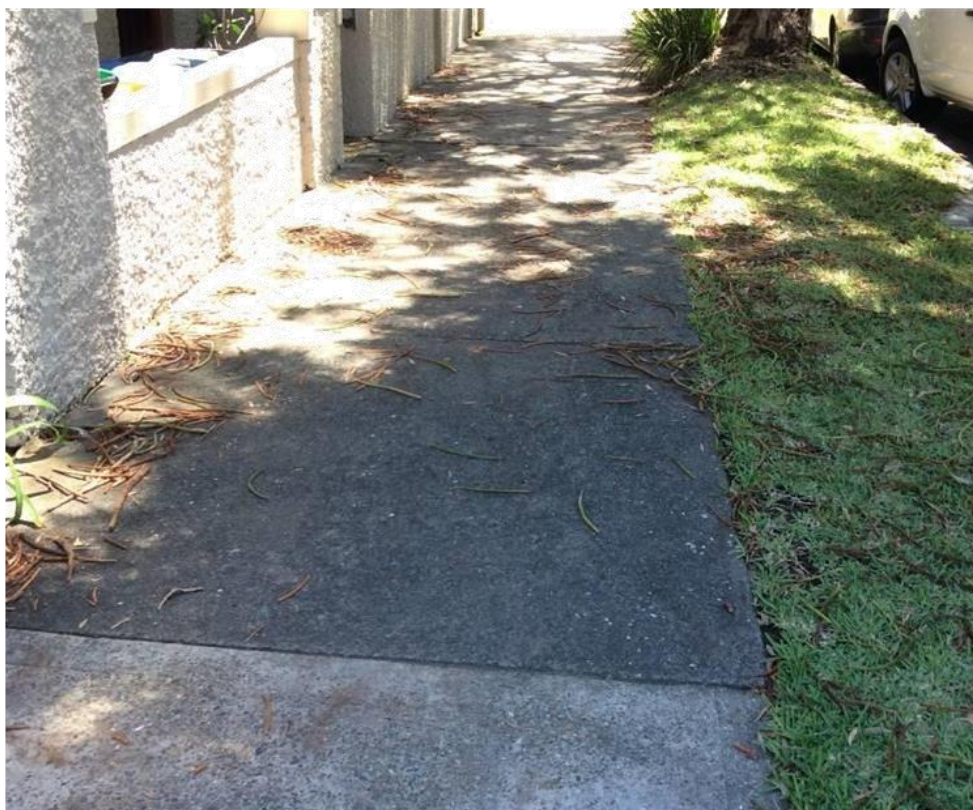


#### 4.3.6 Slip Hazard Audit Findings

Slip hazards accounted for 3 percent of all hazards identified. The issues relating to slip hazards included:

- a large number due to either leaf litter or sand;
- wet surfaces from water features and amenities such as bubblers; and
- deficiencies in the path or kerb, creating ponding.

Figure 4.8 is an example of leaf litter on a footpath. Leaf litter is classed as a slip hazard as it has the potential to cause a less able person to slip and fall.



Reference OBR 9 South of Addison Road

**Figure 4.8: Osbourne Road - Leaf Litter on Path**



Shown below in Figure 4.9 is an example of sand on a footpath. Similar to the previous example sand on a path may cause pedestrians to slip and fall.



Reference ML 16

**Figure 4.9: Manly Lagoon - Sand on Path**

#### 4.3.7 Fall Hazard Audit Findings

The fall hazards identified accounted for a relatively small percentage of the issues found in the study area, less than 1 percent. Of the issues found majority were due to:

- lack of guard rail leading to a risk of fall;
- missing fencing, bordering residential properties; and
- open cellars.

Shown below in Figure 4.10 is an example of an unprotected drop. A drop off the side of a footpath as shown in this example may lead to injury.



Reference WE 6 West of Eustace Street

**Figure 4.10: West Esplanade - Unprotected Drop**

Figure 4.11 shows an open cellar that was unattended at the time of the audit. If a distracted or vision impaired person were to walk and fall into the cellar it may cause significant injury.



Reference PMSR 18 West of Central Avenue

**Figure 4.11: Pedestrian Mall (Sydney Road) - Unattended Open Cellar**

#### 4.3.8 Signage/Linemarking Audit Findings

A small number of signage and linemarking issues were identified during the audit, accounting for 4 percent of issues identified. Of those found, the majority of signage and linemarking issues related to:

- worn or faded signage and linemarking;
- lack of signage indicating the end and start of shared paths; and
- obstruction due to vegetation.



Shown below in Figure 4.12, the direction "LOOK" linemarking and arrow is faded. This linemarking is in place to remind pedestrians of the need and direction to look for approaching vehicles.



*Reference SS1 North of Ashburner Street*

**Figure 4.12: South Steyne - "LOOK" and Directional Arrow are Faded**



Figure 4.13 is an example of a sign facing the wrong direction. In this example, the 40km/h school zone sign is facing the wrong direction and not towards the road.



Reference DR182 North of Ashburner Street

**Figure 4.13: Darley Road School Zone Sign Not Facing Road**

Figure 4.14 shows a damaged warning sign. The damaged sign may not be visible to drivers and may increase the risk of a crash occurring involving pedestrians, in this case young children.



Reference RS108 West of Augusta Lane

**Figure 4.14: Raglan Street - Damaged Preschool Pedestrian Signage**

In Figure 4.15, the linemarking for the shared path ends too early. In this case, the marking should continue the entire length of the foreshore. This missing linemarking may lead to a crash between cyclists and pedestrians using the shared path.



Reference MBF 6

**Figure 4.15: Manly Beach Foreshore - No Linemarking for Shared Path in Sections**



#### 4.3.9 Obstruction Audit Findings

Obstructions accounted for 2 percent of issues identified in the audit. The issues relating to obstructions identified were:

- services and pieces of equipment belonging to local cafes and shops blocking paths;
- construction vehicle;
- railings;
- bollards; and
- vehicles in driveways.

As Manly is a popular tourist destination, there is a wide variety of cafes and small stores along the foreshores and pedestrian malls. These businesses generally utilise the footpaths outside their shop fronts to attract business or sell their services and wares, which may cause an obstruction. Although, most regularly abled pedestrians would easily be able to navigate around these obstructions, those who have a visual impairment or are less able are unlikely to see the obstruction or would have difficulty manoeuvring around the obstruction. This can lead to difficulty in path finding or even potential injury.

Shown below in Figure 4.16 is a set of bollards blocking the footpath. These bollards could lead to a visually impaired person or person who is less mobile sustaining an injury from a fall or tripping.

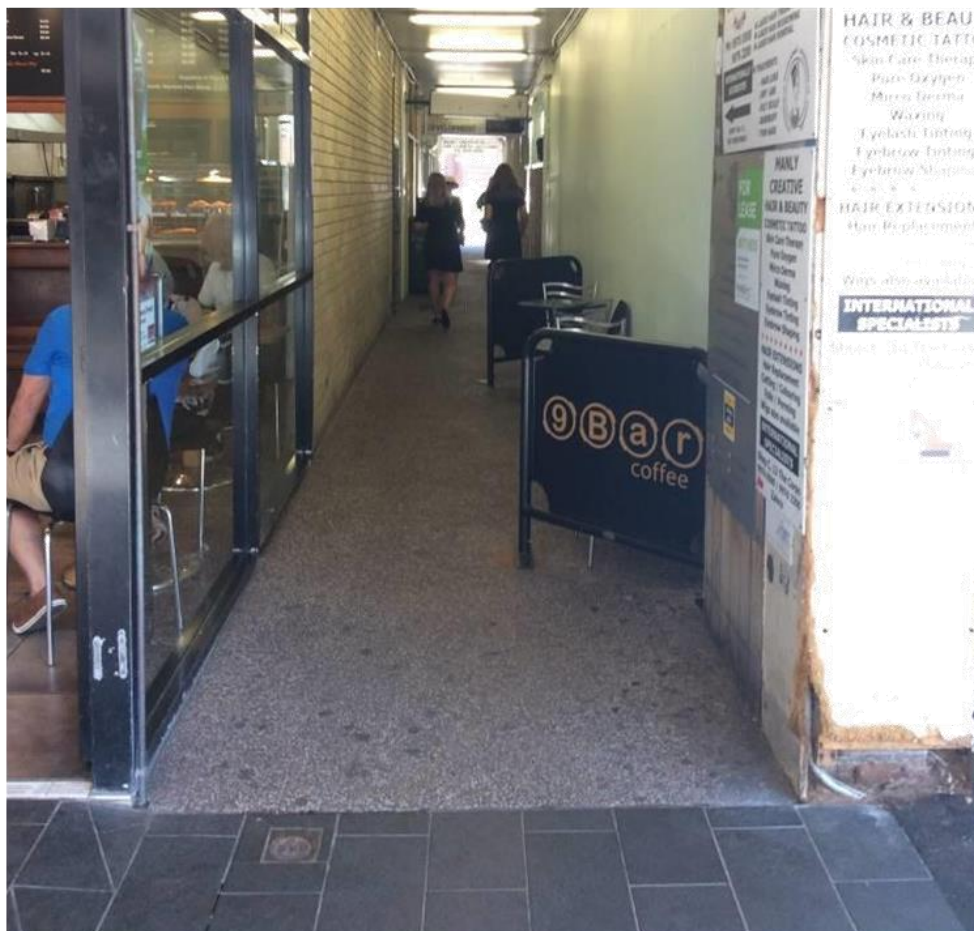


Reference ML 7

**Figure 4.16: Manly Library – Bollards**



Figure 4.17 shows café tables blocking a narrow path. These tables may prevent a person who is less able from being able to pass and use the footpath.



Reference TC42 West of Central Avenue

**Figure 4.17: Café Tables Blocking Narrow Path**

#### 4.3.10 Connectivity Audit Findings

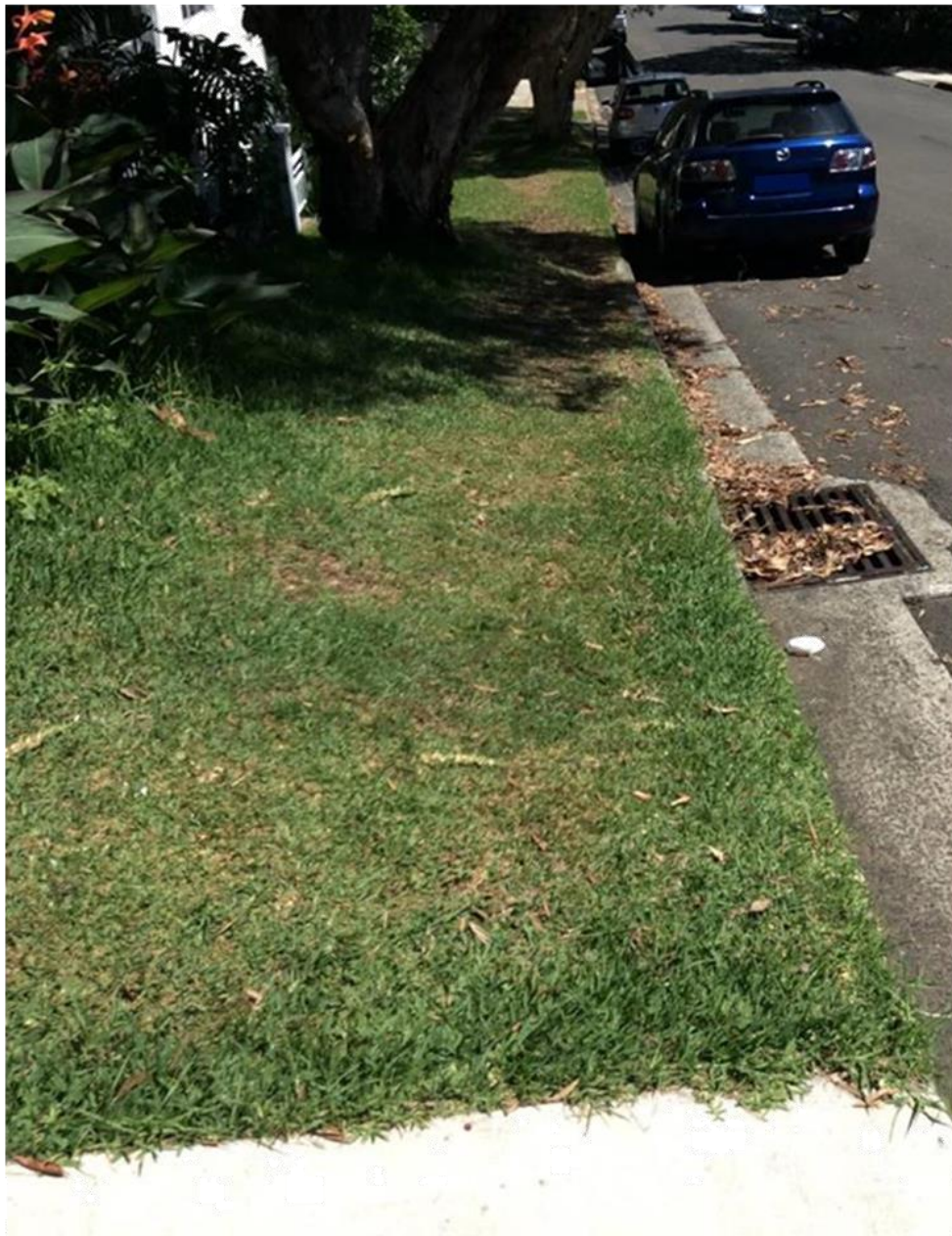
Connectivity issues accounted for 1 percent of all issues identified. The deficiencies identified relating to connectivity were mostly:

- a lack of crossing opportunity;
- missing footpath; and
- a shared path or footpath not connecting to the next section of path.

Other issues of note included:

- multiple crossing points used to access beach; and
- one-way bike paths connecting with footpath/shared path.

Shown below in Figure 4.18 is an example of a footpath ending and not continuing down the length of the street. This may prevent pedestrians who are less mobile from being able to access sections of the street or the facilities to which the streets lead.



Reference MS 35 West of Osbourne Street

**Figure 4.18: Marshall Street - No Path**



Figure 4.19 is an example of a missing crossing opportunity. In this case, a pedestrian is may not be able to cross the road safely because the road is wide, on a curve and there are no kerb ramps along a pedestrian's path of travel.



Reference BS44 North of Bower Lane

**Figure 4.19: Bower Street - No Crossing Opportunity**



#### 4.3.11 Vegetation Audit Findings

Issues relating to vegetation accounted for 9 percent of all issues identified. Issues identified during the audit included:

- overgrown bushes;
- hedges, and trees alongside the footpath or shared path;
- vegetation blocking signage; and
- poorly maintained grass encroaching onto footpaths.

Shown below in Figure 4.20 is an example of a bush or tree blocking a section of the footpath. This may prevent pedestrians from using this section of footpath.



Reference RDS10 South of Cliff Street

**Figure 4.20: Reddall Street - Overgrown Vegetation**

Figure 4.21 shows a tree blocking an "end school zone" sign, which may prevent drivers from seeing the sign.



Reference WS22 West of South Steyne

**Figure 4.21: Wentworth Street - End of School Zone Sign Blocked by Vegetation**



#### 4.3.12 Other Audit Findings

Other issues identified accounted for 1 percent of all issues identified during the audit. Deficiencies that did not fall under a specific area were classed as other. These generally were issues such as:

- damaged fencing;
- broken convex mirrors;
- damaged railings; and
- issues relating to sightlines.

An issue of note identified was a combination high pedestrian area and loading zone, located in Rialto Lane.

Shown below in Figure 4.22 is a broken railing, which may pose a danger to passing pedestrians if they were to fall through the railing.



Reference ML 13 West of Bridge Road

**Figure 4.22: Manly Lagoon - Broken Railing**

Shown below Figure 4.23 demonstrates blocked sightlines along a shared path. If a pedestrian using the bus shelter were to step out, a bicycle user would not be able to see them properly and it may lead to a crash and potentially an injury.



Reference PW 303 North of Eurobin Avenue

Figure 4.23: Pittwater Road - Advertisement Block Sightlines for Shared Path



Figure 4.24 is an example of a high conflict area within a combination loading and high pedestrian area. This area contains trucks loading and offloading goods in loading docks and loading bays throughout the high pedestrian area. Trucks and large delivery vehicles tend to have reduced sightlines. If a pedestrian were to be in a truck's "blind spot" when it manoeuvred, it could lead to a serious injury.



Reference RL 2

**Figure 4.24: High Conflict Area Within Combination of Loading Zone and High Pedestrian Area**

## 5. COMMUNITY CONSULTATION

### 5.1 OVERVIEW

Community consultation is a vital component of establishing a well-informed Pedestrian Access and Mobility Plan for Manly Beach, Manly Wharf, and Manly Town Centre. Encouraging community members to raise issues that they encounter and listening to the local residents, students, community groups and working population of the study area ensures that the best outcomes are achieved from a technical, operational and community standpoint. A range of consultation techniques were used to ensure that the community consultation was effective. The consultation techniques included:

- identifying and contacting key stakeholders by email to obtain their feedback;
- conducting an initial online survey to collect local residential/businesses concerns and feedback on existing pedestrian infrastructure;
- Council promoting and marketing the online survey via the council website;
- three community information sessions at Queenscliff Surf Life Saving Club and the Manly Seniors Centre, to inform the community of the process and answer questions;
- public exhibition of the Draft PAMP encouraging comments from the community.

### 5.2 IDENTIFICATION OF KEY STAKEHOLDERS

#### 5.2.1 Identification and Contact

In the initial stages of the Pedestrian Access and Mobility Plan development, an effort was made to identify and invite comment from a range of community groups, organisations, and businesses in the study area on the experiences of their staff and customers in relation to the level of accessibility and facilities for pedestrians. A wide variety of key stakeholders was contacted via email to incorporate a diverse and comprehensive cross section of groups and organisations that make up a significant portion of pedestrians. The list of key stakeholders that were contacted is shown in Table 5.1.

**Table 5.1: Key Stakeholders Contacted for Comment on Pedestrian Facilities**

Stakeholder	Date	Method
Manly Library	16/03/2017	Email
Manly Bowling Club	16/03/2017	via Website
North Manly Bowling & Recreation Club	16/03/2017	via Website
Manly Vale - Calabria Bowling Club	16/03/2017	Email
St. Matthews Anglican Church	16/03/2017	Email
St. Andrews Presbyterian Church	16/03/2017	Email
Manly Village Uniting Church	16/03/2017	Email
Manly Freshwater Parish	16/03/2017	Email
Manly Life Church	16/03/2017	Email
Hotel Steyne	16/03/2017	Email
Ivanhoe Hotel	16/03/2017	Email
New Brighton Hotel	16/03/2017	Email
Manly Chamber of Commerce	16/03/2017	Email
Manly Visitor Information Centre	16/03/2017	Email
Hello Manly	16/03/2017	Email
Bikes And Pedestrian User Group	16/03/2017	Email
Manly Seniors Centre	16/03/2017	Email
<b>Schools</b>		
Manly Village Public School	16/03/2017	Email
Manly West Public School	16/03/2017	Email
St. Mary's Manly	16/03/2017	Email
Northern Beaches Secondary College - Mackellar Girls Campus	16/03/2017	Email
St. Pauls Catholic College	16/03/2017	Email
Stella Maris College	16/03/2017	Email
Northern Beaches Secondary College - Balgowlah Boys Campus	16/03/2017	Email
<b>Surf Clubs</b>		
North Steyne Surf Club	16/03/2017	Email
Manly Life Saving Club	16/03/2017	via Website
Queenscliff Surf Life Saving Club	16/03/2017	Email
<b>Hospitals</b>		
Manly Waters Private Hospital	16/03/2017	Email

## 5.2.2 Responses from Stakeholders

Questions were developed to enquire about on the experiences of their staff and customers in relation to the level of accessibility and facilities for pedestrians.

Three (3) responses were received from the stakeholders contacted. They are summarised as follows:

One stakeholder identified the use of the zebra crossing immediately adjacent to the Manly Surf Lifesaving Club at the corner of Collingwood Street, Bridge Road, and North Steyne as an issue. The respondent identified the increased volumes of pedestrians using the crossing due to activities relating to the surf club as well as risks posed to pedestrians due to normal use.

Another stakeholder identified that access to crossing opportunities was limited at the intersection of Balgowlah Road and Pittwater Road.

Finally, a stakeholder raised an issue regarding the two (2) pedestrian crossings adjacent to the local school/parish. The crossings were located on Raglan Street, between Central Avenue and Short Street, and on the corner of Raglan Street and Whistler Street. Concerns were raised regarding vehicles not stopping at the crossing located on Raglan Street and the location and configuration of the crossing on Whistler Street.

As a part of communication with key stakeholders, feedback has been sought from the Northern Beaches Council. The Council is in regular contact with members of the community, particularly community members with poor mobility or impairment. Council sent a detailed list of issues to Bitzios Consulting, which has been noted and included in the list of issues for consideration to be assessed. A copy of the issues raised by Council is provided in Appendix E.

## 5.3 ONLINE COMMUNITY SURVEY

### 5.3.1 Methodology

An online survey using *SurveyMonkey* was set up by Bitzios Consulting seeking responses from local businesses and residents of the study area about their experiences as a pedestrian. At this time, there was also an opportunity for business owners and staff to raise any concerns or to ask questions. An advertisement was placed on the Northern Beaches Council website. The survey was made available from mid-March to mid-April 2017. A total of 102 responses were received.

The online survey addressed the following topics:

- pedestrian trip journey origin (where a respondent was from);
- purpose of trips made walking within the study area;
- issues with existing crossings, footpaths and kerb ramps; and
- desired upgrades to pedestrian facilities with regards to crossings, kerb ramps, streetscape, directional signage, accessibility, and safety and security.

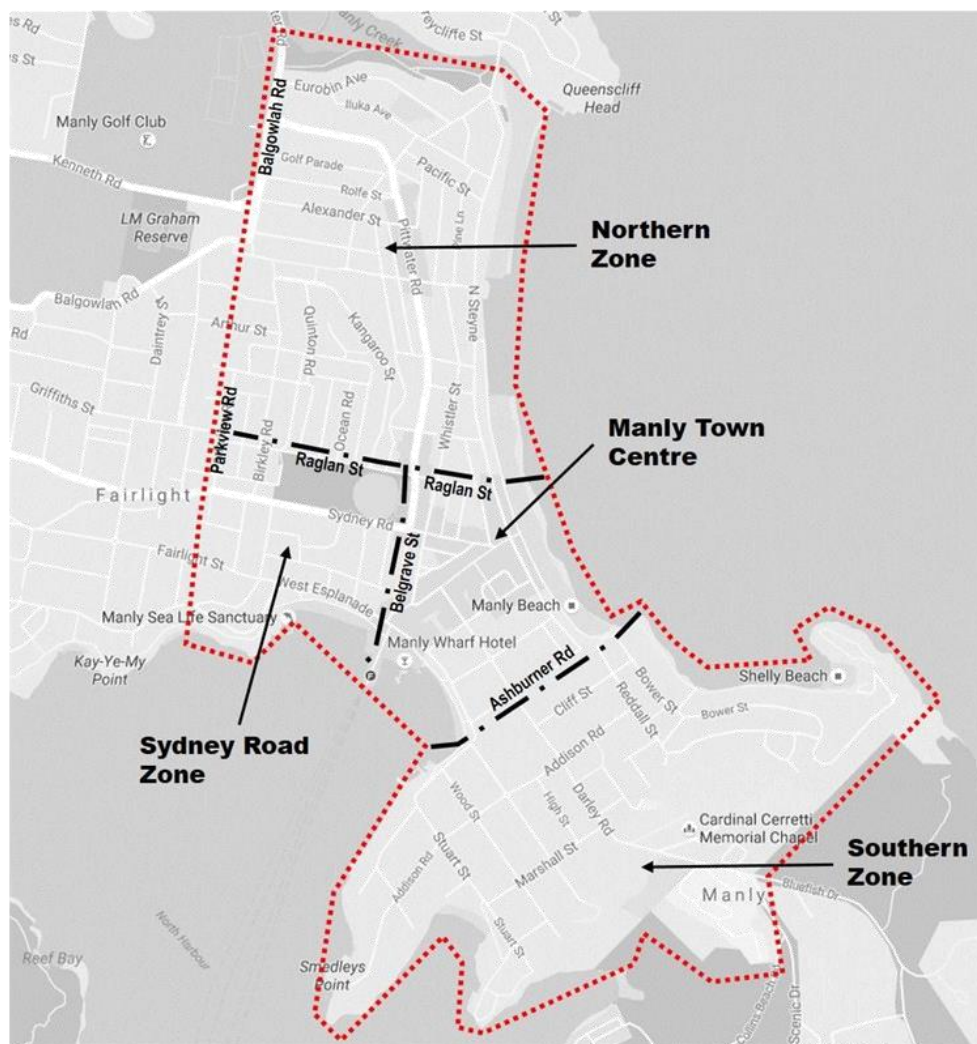
The online survey responses are provided in Appendix E.

The key survey responses are summarised below.



### 5.3.2 Pedestrian Origin

Respondents were asked to identify their precinct origin, aided by use of a map outlining the specific zones. The zones specified were the Manly Town Centre, Northern Zone, Southern Zone, and Sydney Road Zone. These zones are shown in Figure 5.1.



**Figure 5.1: Precinct Boundaries**

The vast majority of respondents identified with the Northern zone, closely followed by a combination of the Manly Town Centre and Southern Zone as their precinct of origin. As a result, the SurveyMonkey data is more applicable to these three zones rather than the Sydney Road zone, which received relatively few responses. Approximately 60% of respondents answered this question.

Respondents were also asked to identify they were either a resident of Manly, Business owner, worker or tourist. Of the 95% who answered this question approximately 85% of respondents identified as residents, followed by workers.

### 5.3.3 Areas of Interest

Respondents were asked to identify their favourite/most visited destinations in Manly. The areas identified, in no particular order, were as follows:

- Shelly Beach;
- Manly Beach;
- The Corso/Town Centre;
- Manly Lagoon
- Manly Library; and
- Manly Ferry Terminal/Wharf.

As a follow up question, respondents were then asked their main mode of transport when visiting these locations. The respondents identified their main mode of transport as being walking (80%), car and walking (30%), cycling (30%) and by car (25%). The remainder of respondents identified use of the bus, ferry, and taxi/ride share services as their mode of transport. Note: respondents were given the option of identifying multiple modes of transport.

### 5.3.4 Purpose of Pedestrian Trips

Respondents were asked to identify the purpose of common trips taken walking within the study area. As shown in Figure 5.2, the most frequently cited purposes for walking were for leisure/health, followed by access to shops and transport facilities. Respondents who answered "other" mostly were more specific in their answers to leisure and health with answers relating to beaches and restaurants.

#### If you walk, what is your main purpose?

Answered: 95 Skipped: 5

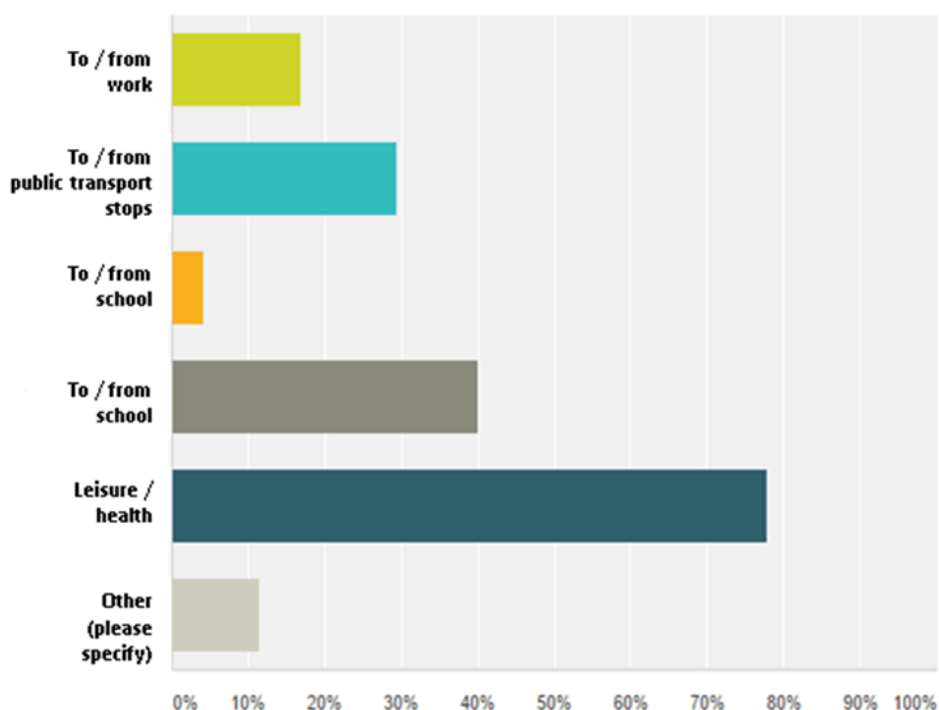


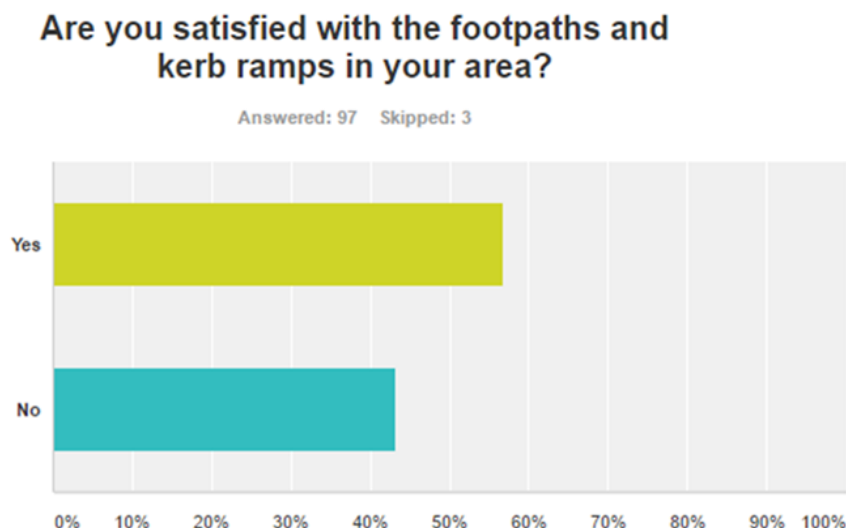
Figure 5.2: Reasons for Walking

Please note that respondents could select multiple options for this question, and five respondents chose not to answer this question.

### 5.3.5 Pedestrian Satisfaction

In question 7, respondents were asked to identify whether they were satisfied with the existing footpaths, kerb ramps, and pedestrian facilities. The results were:

- 56% were satisfied with the footpaths and kerb ramps in their area;
- 44% were not satisfied with the footpaths and kerb ramps in their area.



**Figure 5.3: Pedestrian Satisfaction – Footpaths and Kerb Ramps**

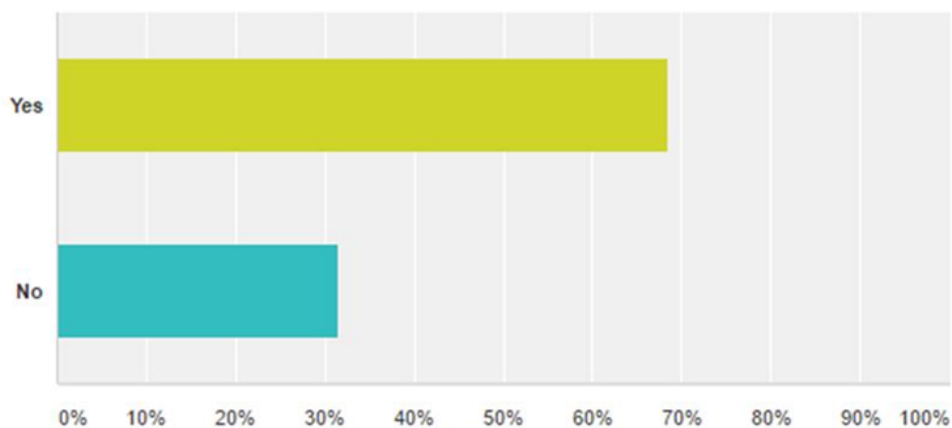
More than half of respondents were satisfied with the footpaths and kerb ramps in their area, with 56% of respondents expressing satisfaction with existing infrastructure in place. Of the respondents who were not satisfied, three main issues were raised; these included:

1. the lack of footpaths on both sides of the road;
2. the uneven nature of footpaths made it difficult to manoeuvre for the less mobile; and
3. kerb ramps lacking connectivity or being poorly aligned.

In Question 8, respondents were asked if they were satisfied with the pedestrian facilities in their area. The majority of respondents were satisfied with the overall existing condition and infrastructure provided by pedestrian facilities in the study area with a satisfaction rating of 68%. Of the respondents who were not satisfied with the pedestrian facilities, issues were raised such as correct use of shared paths, lack of crossing opportunities, crossing at the Manly Ferry Terminal and general misgivings regarding the safety of zebra crossings. The results of this question are shown in Figure 5.4.

### In general, are you satisfied with the pedestrian facilities in your area?

Answered: 95 Skipped: 5



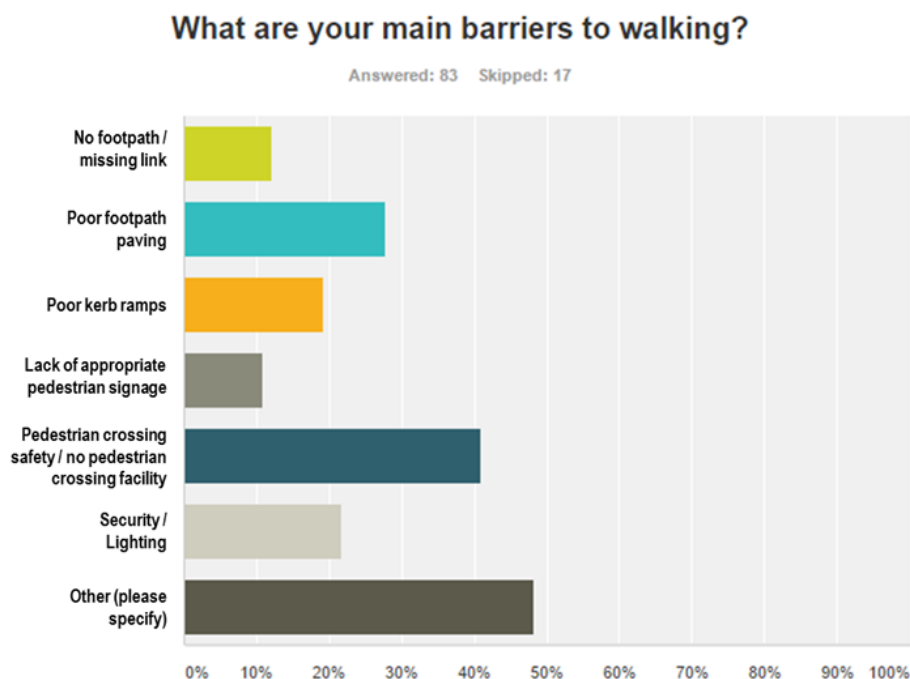
**Figure 5.4: Pedestrian Satisfaction – Pedestrian Facilities**

Of the respondents, three chose not to answer Question 7 and seven chose not to answer Question 8.



### 5.3.6 Barriers to Walking

Respondents were asked to consider what the main barriers to walking were in their local Precinct. The results are shown in Figure 5.5.



**Figure 5.5: Main Barriers to Walking**

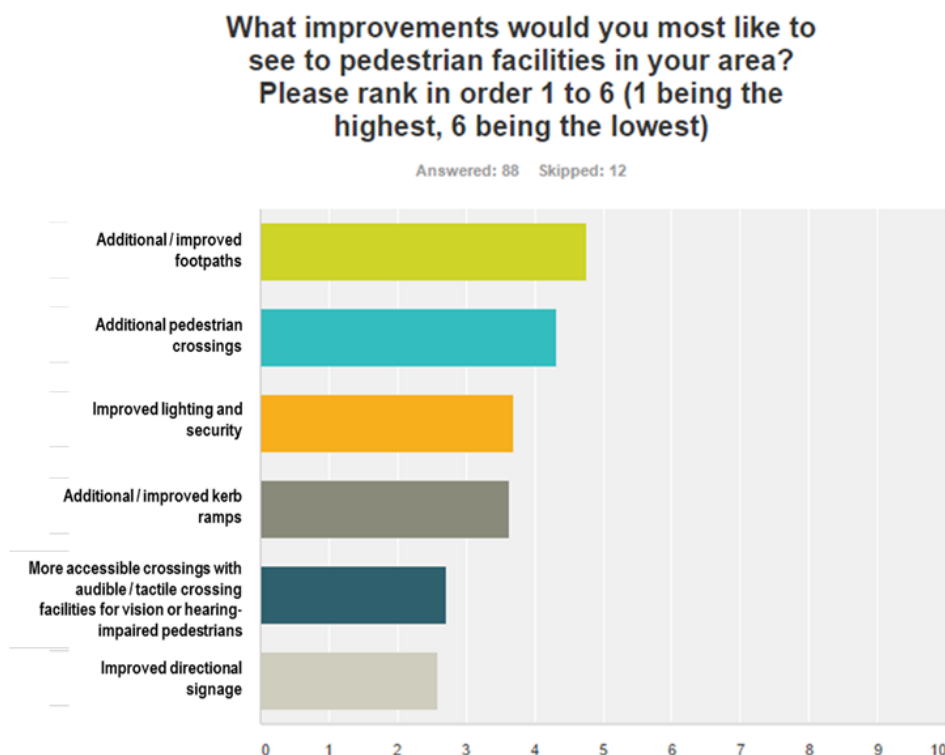
The response to this question ranked by percentage were:

1. Pedestrian crossing safety (41%);
2. Poor footpath paving (28%);
3. Security and lighting (22%);
4. Poor kerb ramps (19%);
5. No footpath/missing link (12%); and
6. Lack of appropriate pedestrian signage (11%).

Of the 102 respondents, 17 opted not to answer this question. Although "other" was the most popular result, accounting for 50% of responses, there was no discernible pattern or category of issues present, but rather a multitude of specific barriers relating to general traffic conditions.

### 5.3.7 Desired Improvements

Respondents were asked about which improvements to pedestrian facilities they would most like to see in their area on a ranking scale system, with 1 being the highest priority and 6 being the lowest priority. The results are shown in Figure 5.6.



**Figure 5.6: Desired Improvements to Pedestrian Facilities**

This question was answered by 72% of respondents in full and 84% completed five out of the six sections. This information provides an indication of the types of improvements suggested by respondents. In order of most wanted to least, the results are as follows:

- Additional / improved footpaths;
- Additional pedestrian crossings (e.g. traffic signals, zebra crossing, refuge islands);
- Improved lighting and security;
- Additional / improved kerb ramps;
- More accessible crossings with audible / tactile crossing facilities for vision or hearing-impaired pedestrians; and
- Improved directional signage.

### 5.3.8 Location Specific Feedback

Question 11 of the SurveyMonkey survey allowed respondents to raise any other issues that they may have encountered in the study areas outlined. 81 responses were received with 79 specific to the precinct areas. The responses are provided in Appendix E. A summary of the location specific responses can be seen in Table 5.2.

**Table 5.2: Community Survey Location Specific Issues**

Location	Category
Pittwater Road at Harris Farm	Crossing Opportunity
East Esplanade and Ashburner Street	Crossing Opportunity
Pittwater Road and Carlton Street	Crossing Opportunity
North Steyne and Carlton Street	Crossing Opportunity
East Esplanade and Osbourne	Footpath
Darley Road	Footpath
Ocean Road	Kerb Ramp
Manly Lagoon	Lighting
West Esplanade and Commonwealth Parade	Pedestrian Refuge
Manly Wharf	Pedestrian Signals
The Corso and Darley Road	Pedestrian Signals
Marine Walk	Shared Path
Queenscliff Surf Life Saving Club	Zebra Crossing
Balgowlah and Kenneth Road	Zebra Crossing
North Steyne and Pacific Street	Zebra Crossing
Ashburner Street and Darley Road	Zebra Crossing
East Esplanade and Victoria Parade	Zebra Crossing

Each of the categories shown in the table above can be defined as follows:

- **Crossing opportunity** - responses identifying a lack of pedestrian infrastructure to assist in crossing a road, this accounted for 11% of responses;
- **Footpath** - responses identifying issues with the condition of a footpath, this accounted for 19% of responses;
- **Kerb Ramp** – responses identifying issues with the condition of kerb ramps or a missing kerb ramp, this accounted for 7% of responses;
- **Lighting** - responses identifying areas lacking lighting or existing lighting in poor condition, this accounted for 6% of responses;
- **Pedestrian Refuge** – responses identifying the need for a pedestrian refuge or a safety concern with an existing pedestrian refuge, this accounted for 3% of responses;
- **Pedestrian Signals** – responses identifying the need for a signalised crossing or issues with existing signalised crossing, this accounted for 14% of responses;
- **Shared Path** - responses identifying the need for a shared path in a particular location or a safety issues with an existing shared path, this accounted for 12% of responses; and
- **Zebra Crossing** - responses identifying the need for a zebra crossing or an issue with an existing zebra crossing, this accounted for 10% of responses.

The remaining 18% of responses received identified general traffic concerns or gave responses that were out of scope for this study.

#### 5.4 COMMUNITY INFORMATION SESSIONS

During the consultation process, three (3) community workshops were held. Advertising for these information sessions was coordinated by Northern Beaches Council through their website and via an email subscriber list. Various community groups were also contacted via email. Bitzios Consulting prepared a detailed presentation to deliver during the sessions and had two senior staff members to answer questions and document any other pedestrian issues that may have been missed in the initial investigations.

The workshops were held as follows:

- **Tuesday 11 April 2017, 2pm to 4pm** - Queenscliff Surf Life Saving Club, Ground floor – North Steyne and Collingwood Street, Manly;
- **Tuesday 11 April 2017, 5:30pm to 7:30pm** - Manly Seniors Centre, 275 Pittwater Road, Manly; and
- **Wednesday 12 April 2017, 2pm to 4pm** - Queenscliff Surf Life Saving Club, Ground floor - North Steyne and Collingwood Street, Manly.

The attendance for each workshop was as follows:

- **Tuesday 11 April, 2pm to 4pm** – Five (5) attendees, three (3) of whom registered by email and two (2) of whom were walk-ins. Workshop ended 3:15pm;
- **Tuesday 11 April, 5:30pm to 7:30pm** – no attendees. Despite having seven (7) registered to attend, it was decided at 6:10pm, 40 minutes after the workshop was due to start, in agreement with the Council representative present, to end the workshop early; and
- **Wednesday 12 April, 2pm to 4pm** – Three (3) attendees present.

The issues raised by the community during the community workshops are summarised as follows:

- Crossing opportunities at or near the intersection of Balgowlah Road and Pittwater Road, particularly regarding access to the Seniors Centre and Harris Farm Markets;
- Safe crossing at the pedestrian refuge on Commonwealth Parade, south of West Esplanade;
- Crossing at Manly Ferry Terminal, across West/East Esplanade to Belgrave Street and The Corso. A suggestion was given, by attendees, for the installation of a countdown timer at the traffic lights; and
- Correct usage of shared paths, regarding enforcement and raising awareness of rules and correct usage. Particularly of note was the paths along the beachfront along North Steyne.



## 6. SPECIFIC ISSUES AND RECOMMENDATIONS

Throughout the consultation process, a number of specific issues were raised by Council, workers, tourists, and residents. These issues were highlighted during the community workshops and the online survey. As these issues were raised as being of considerable concern, further investigations were conducted and recommendations are discussed in detail in the following sections.

### 6.1 PITTWATER ROAD BETWEEN BALGOWLAH ROAD AND COLLINGWOOD STREET

It was identified that there were concerns regarding the lack of a crossing opportunity at Pittwater Road between Balgowlah Road and Collingwood Street, which is in close proximity to the Harris Farm Markets and the Manly Seniors Centre. Pittwater Road is a major road that carries a substantial amount of traffic each day. Hence, a safe crossing point for residents on the northern side of Pittwater Road to access Harris Farm and/or other amenities on the southern side of Pittwater Road is desirable. The section of road in question has high pedestrian attractors, these being Harris Farm, the Manly Seniors Centre, and the Manly Andrew Boy Charlton Swim School.

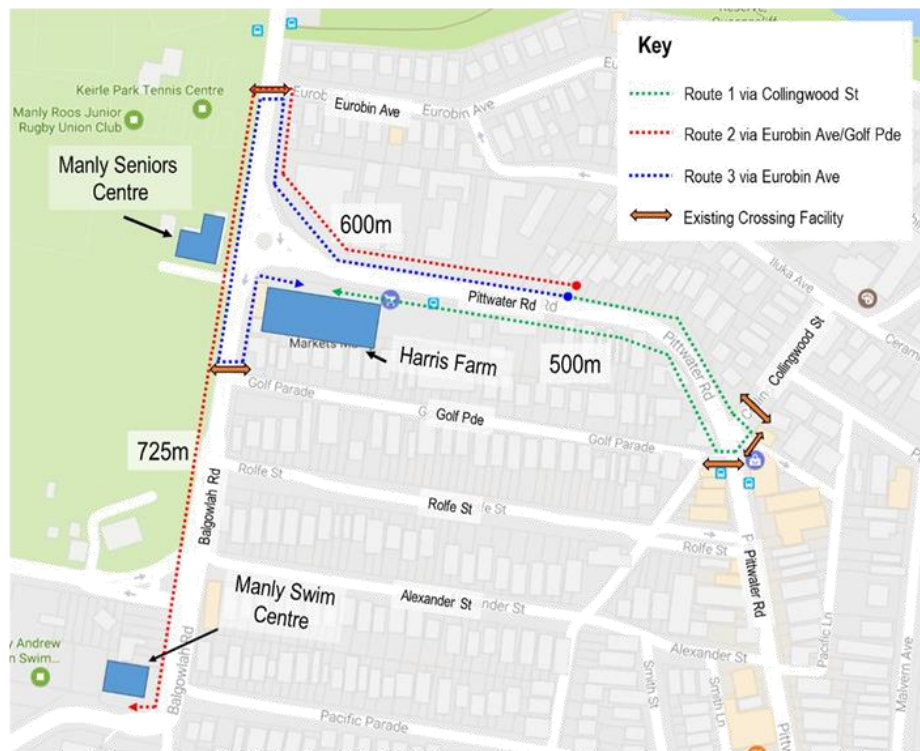
The strongest pedestrian desire lines are were identified as:

- The bus stops and medium density residential premises north of Pittwater Road and Harris Farm;
- The bus stops and medium density residential premises north of Pittwater Road and the Manly Seniors Centre; and
- The bus stops and medium density residential premises north of Pittwater Road and the Manly Andrew Boy Charlton Swim School.

To cross from the north of Pittwater Road to the previously outlined destinations would involve the following detours:

- Route 1 via Collingwood Street – 500m;
- Route 2 via Eurobin Avenue and Golf Parade – 600m; and
- Route 3 via Eurobin Avenue – 725m.

These routes are outlined further in Figure 6.1.



Source: Based on Google Maps

**Figure 6.1: Path to Cross Pittwater Road Using Existing Facilities**

Due to the complexity of the area, there is a need to balance the flow of traffic with pedestrian safety; three options are discussed below.

#### 6.1.1 Option 1 Pedestrian Refuge and Kerb Extension

A pedestrian refuge is an island in the middle of the road. The island allows pedestrians to cross the road in two stages. An example of a pedestrian is shown in Figure 6.2.



Source: Blacktown City Council

**Figure 6.2: Example of a Pedestrian Refuge**

Option 1 evaluates the construction of a pedestrian refuge and kerb extension on Pittwater Road. At the proposed location, a kerb extension would minimise the crossing distance. Although Pittwater Road is a four-lane road, it is operating as a two-lane road with kerb side parking allowed. Hence, the installation of kerb extensions and a refuge island are not likely to disrupt the existing traffic conditions. While refuges do not give pedestrians right of way, they allow crossing to be staged one traffic stream at a time. The relocation of bus stops would need to be considered in conjunction with Transport for New South Wales and Roads and Maritime Services.

It should be noted that this option, however, is only a short-term solution. With continued growth in the Manly LGA the need to install clearways along Pittwater Road to enable four lanes of free-flowing traffic would become apparent, this would then dictate the removal of the pedestrian refuge and if the pedestrian volumes warranted, a signalised mid-block crossing (traffic lights) could be installed in place of the refuge island.



Source: Based on Google Maps

**Figure 6.3: Concept Design for Refuge Island on Pittwater Road**

### 6.1.2 Option 2 Signalised Mid-Block Crossing (Pedestrian Traffic Lights)

A signalised mid-block crossing (or pedestrian traffic lights) is a location in between intersections where a set of traffic lights is used to cross the road.

Option 2 proposes the installation of a signalised mid-block crossing (pedestrian traffic lights) in a similar location as proposed in Option 1. The installation of a signalised mid-block crossing may greatly reduce the risk for pedestrians wanting to cross Pittwater Road, specifically less mobile pedestrians who may not be able to cross at a refuge island in a timely or safe manner. Further consideration would need to be given to the coordination of the signal timing with the signalised intersection upstream and downstream. This would ensure that the installation of the signalised mid-block crossing (pedestrian traffic lights) does not worsen the existing traffic conditions. Figure 6.4 outlines the proposed location for the midblock crossing.

Although the existing pedestrian counts would not warrant for a signalised mid-block crossing, given the number of elderly residents located in the area, the installation of mid-block crossing is desirable. Additional consultation with Roads and Maritime Services to approve the installation of a signalised mid-block crossing would be required.





Source: Based on Google Maps

**Figure 6.4: Concept Design for a Mid-block Crossing (Pedestrian Traffic Lights) on Pittwater Road**

### 6.1.3 Option 3 Signalised Pittwater Road and Balgowlah Road Intersection (Traffic Lights)

Option 3 would be to convert the existing roundabout at Pittwater Road and Balgowlah Road into a signalised intersection (traffic lights). This option would provide protected pedestrian crossings on all approaches. Further analysis would be required in designing the intersection. Signal coordination with the signalised intersection upstream and downstream would be required. This option would involve significant civil construction works and may cause some disruption to traffic and considerable cost in the design and construction stages.





Source: Based on Google Maps

**Figure 6.5: Concept Design for Fully Signalised Intersection Pittwater Road**

## 6.2 BOWER LANE

Bower Lane provides local access to Marine Parade and Shelly Beach, particularly during the weekends, school holidays, and public holidays. Currently Bower Lane is a high conflict area with a combination of continuous pedestrian traffic and a loading zone. This may pose significant risk to the pedestrians, especially those less mobile who are unable to navigate past the vehicles easily.

Due to the narrow width of Bower Lane, delivery vehicles are unable to turn around at the end of the lane, so either reverse into the lane from Bower Street or drive in forward and reverse out into Bower Street.

Bower Lane has a footpath on either side along its length, but due to the steep grade and the cracked and uneven footpath, some pedestrians choose to walk on the street. This presents a challenge for those with limited mobility and caretakers for children who wish to visit the area by walking.

It is recommended that Bower Lane be converted to a shared zone, similar to the example shown in Figure 6.6, in accordance with the *Roads and Maritimes Services Design Implementation of Shared Zones Including Provision for Parking* (TTD 2016/001). A link to which can be found in Appendix A.



Source: Roads and Maritimes Services TTD 2016/001: Design and implementation of shared zones including provision for parking.

**Figure 6.6: Example of a Shared Zone**

Reconfiguring Bower Lane into a shared zone would entail the removal of the kerb and thus widen the existing laneway. This would allow commercial vehicles to complete a three-point turn wholly within the lane and remove the need to reverse in and out of the lane. The change to a shared zone would also involve the installation of smooth paving to create a more comfortable and safer walking environment for all user groups, as shown in the example of a shared zone in Figure 6.6 above.

In conjunction with the implementation of a shared zone, it is recommended to restrict the loading time and size of commercial vehicles. This would provide a safer environment for pedestrians accessing Bower Lane by reducing the time that the lane is shared by both pedestrians and commercial vehicles.

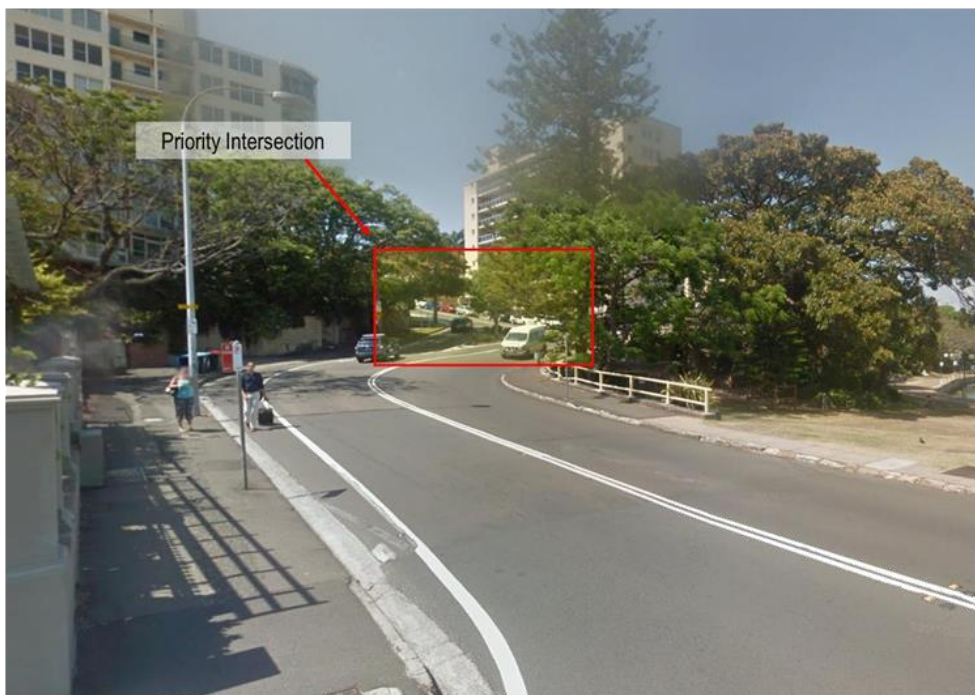
### 6.3 ASHBURNER STREET AND EAST ESPLANADE

The issue of pedestrians wanting to cross East Esplanade at Ashburner Street was raised as an area of concern. Several concerns were raised at this location; they include:

- The area proposed for a zebra crossing is located less than 30 metres from a corner; and
- The proposed location is at the base of a step gradient.

The following points demonstrate why a zebra crossing would not be suitable:

- This location would not allow adequate sight distance for pedestrians to see approaching cars and similarly for a driver to see pedestrians who may be crossing; and
- Drivers travelling down the hill are likely to take longer to come to a stop.



Source: Based on Google Maps

**Figure 6.7: View from Ashburner Street towards the Priority Intersection**

To improve pedestrian safety further, the extension of the crash barrier on the northern side of East Esplanade, pedestrian fencing, and a pedestrian refuge just north of Ashburner Street are recommended, as shown in Figure 6.8. The intention is to direct pedestrians away from the corner and create a safe location to cross.





Source: Based on Google Maps

**Figure 6.8: Proposed Changes to East Esplanade and Ashburner Street**



#### 6.4 BRIDGE ROAD NEAR NORTH STEYNE PEDESTRIAN CROSSING

The location and use of the wombat crossing near Queenscliff Surf Life Saving Club located at the intersection of North Steyne, Collingwood Street, Cameron Avenue and Bridge Road was raised as a concern. It was identified that the use of this crossing was causing congestion for vehicles at the intersection. It was observed that pedestrians parked their cars in Cameron Avenue, which is time restricted to a period of less than 2 hours (2P parking), and then use the crossing to access the foreshore and Queenscliff Surf Life Saving Club (QSLSC). Given the regular use of the crossing for access to the QSLSC and other attractors, concerns were raised about the safety of children and other pedestrians, who would regularly use the crossing for the Nippers junior activities program and access to the beach.

An evaluation of the appropriateness of the crossing was undertaken and found that under section 7.2.4 in *Austrroads Guide to Traffic Management, Part 8: Local Area Traffic Management*, a wombat crossing at this location would be inappropriate. The section states, due to insufficient sight distance a wombat crossing would be inappropriate. The crossing is shown in Figure 6.9.



Source: Based on Google Maps

**Figure 6.9: Location of Pedestrian Crossing North Steyne and Bridge Road**

As outlined previously, this crossing is at a strong pedestrian desire line. Therefore, the removal of the wombat crossing would not prevent pedestrians from continuing to cross at the existing location. Therefore, in conjunction with the removal of the existing wombat crossing three options have been discussed.

##### 6.4.1 Option 1 Relocation of Pedestrian Crossing

Option 1 involves the relocation of the existing wombat crossing south, approximately 50 to 60 metres along North Steyne, as shown in Figure 6.10. The location for the proposed wombat crossing is on a straight section of road with clear sightlines in both directions and no adjoining side streets.



Source: Based on Google Maps

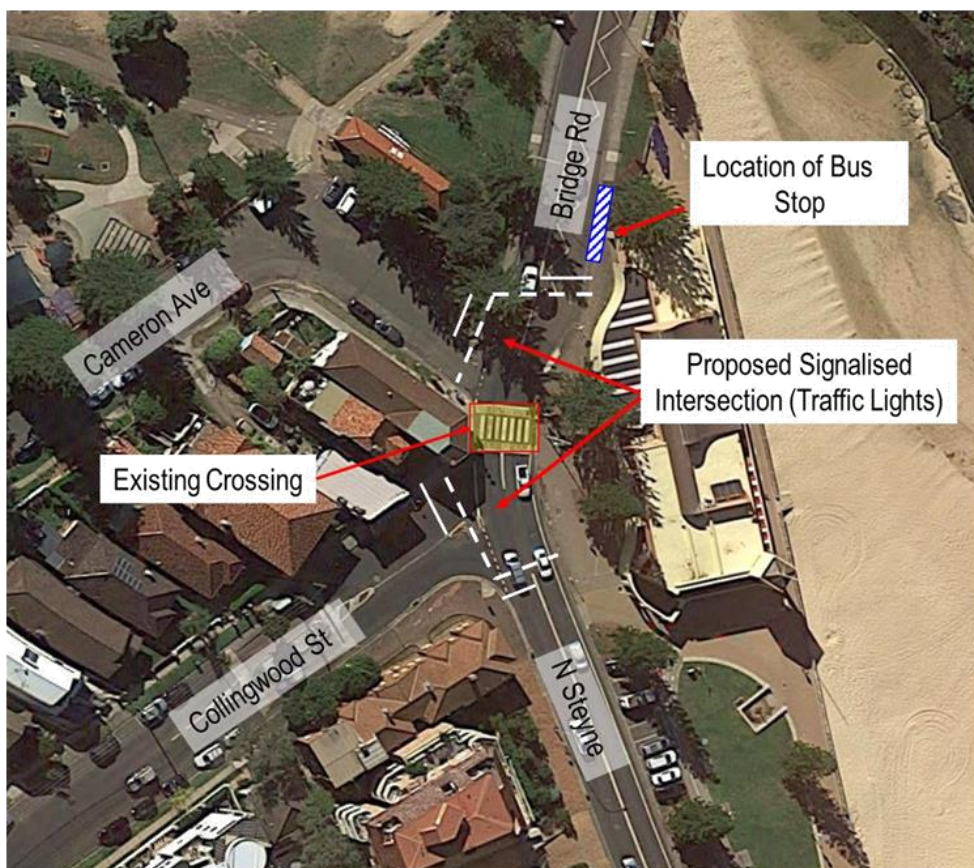
**Figure 6.10: Concept Design Relocation of North Steyne Pedestrian Crossing**

The proposed location would resolve the issues raised regarding the crossing's current location as specified in section 7.2.4 in the *Austrroads Guide to Traffic Management, Part 8: Local Area Traffic Management*. Installation of a crossing at the proposed location would require the removal of one or more parking spaces along the foreshore. This may put pressure on the parking infrastructure in the area especially given the proximity to pedestrian generators and attractors, with consideration to be given to the bus stop, pedestrian and residential driveways nearby.

#### 6.4.2 Option 2 Installation of Signalised Intersection

Option 2 proposes the installation of a signalised intersection (traffic lights) at the intersection of North Steyne, Collingwood Street, Cameron Avenue, and Bridge Road as shown in Figure 6.11.





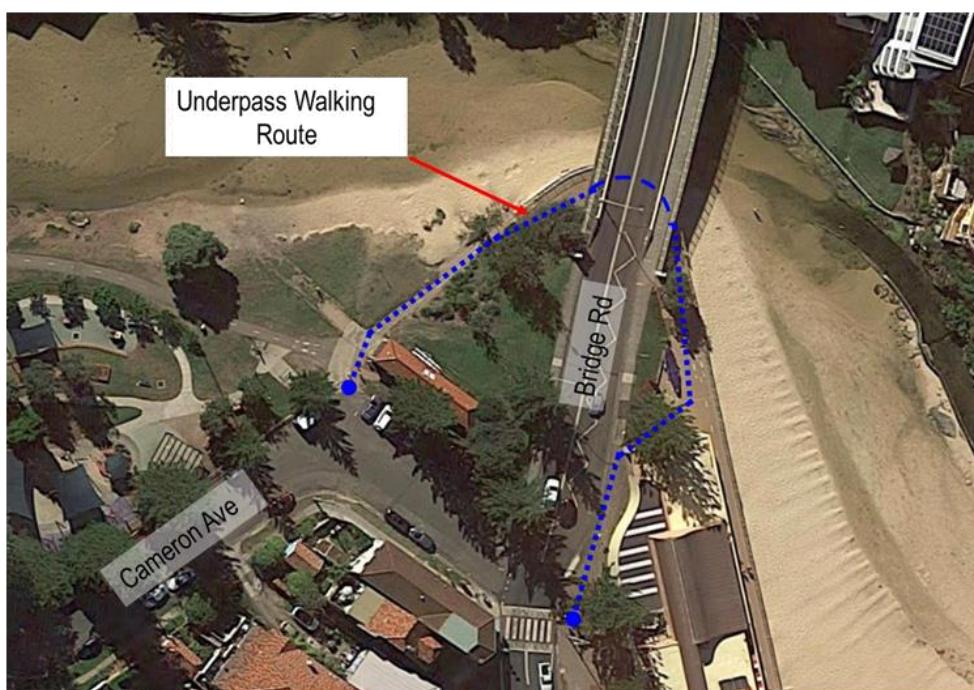
Source: Based on Google Maps

**Figure 6.11: Concept Design for North Steyne and Bridge Road Signalised Intersection**

This option allows for protected pedestrian crossing opportunities at all four streets reducing the risk to pedestrians. The signalised intersection may assist in reducing congestion, as all vehicle movements would be controlled. However, this option would involve significant civil works and may cause disruption to traffic during the construction stage. Also of note is the location of a bus stop on Bridge Road, 5 meters north of Cameron Avenue as shown in Figure 6.11. Consideration should be given to the bus stop during design.

#### 6.4.3 Option 3 Re-direction through Pedestrian Underpass

The existing wombat crossing is a high pedestrian desire line; therefore, pedestrians may continue to walk across the road following the removal of the wombat crossing. Option 3 utilises the already existing pedestrian underpass located just north of the Queenscliff Surf Life Saving Club (QSLSC) and the Lagoon adjacent to Cameron Avenue. As seen below in Figure 6.12, the underpass is accessible from Cameron Avenue and the Manly Beach foreshore.



Source: Based Google Maps

**Figure 6.12: Lagoon to Queenscliff Surf Life Saving Club via Underpass**

Use of the Underpass would allow for uninterrupted flow of traffic from Bridge Street through North Steyne as well as reducing the risk to pedestrians. In order to encourage more people to use the underpass, the following improvements are recommended:

- Installation of wayfinding signs, directing users via the underpass to the beach and surrounds;
- Widening of the path to allow for shared use by bicycles and pedestrians; and
- Installation of lighting.

Following works to the underpass, education of residents and tourists would be required to ensure they were aware of the alternative route. This could be done through use of the following:

- Advertising on the Council website;
- Advertising material, such as leaflets, distributed to local businesses located in high pedestrian areas;
- Bus and Television campaigns; and
- Announcements at local community sporting events, for example The Queenscliff Surf Life Saving Club Nippers Program.



## 6.5 TOWN HALL PEDESTRIAN CROSSING – THE CORSO AND WHISTLER STREET

Concerns were raised over the safety of the zebra crossing, located adjacent to the Town Hall and the Council Chambers, providing a crossing across The Corso and Whistler Street.

An audit was conducted pursuant to the guidelines set out in section 7.2.4 in the *Austroads Guide to Traffic Management, Part 8: Local Area Traffic Management*. The guidelines specify that the distance from the edge of the marked crossing to the outer edge of the ramp be no more than 1.5m. The limit is exceeded in this crossing, as shown in Figure 6.13.

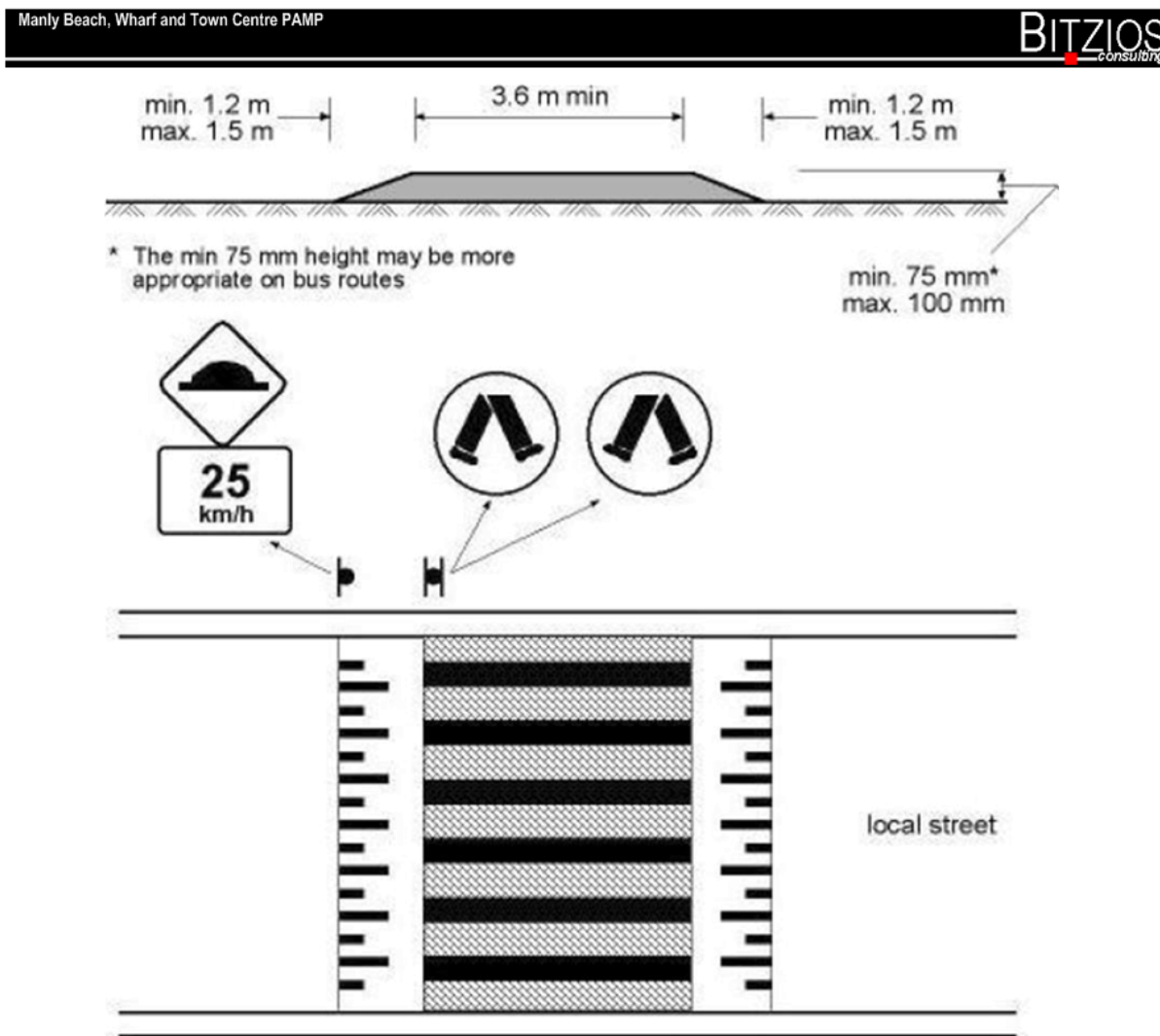
Some pedestrians were observed to use the unmarked section of the crossing rather than cross at the marked section, which may pose a risk to pedestrians. This is due to drivers not expecting a pedestrian to step onto the road prior to the formal crossing.



Source: Based on Google Maps

**Figure 6.13: Pedestrian Crossing Located at The Town Hall**

In order to resolve the compliance issue, it is recommended that the crossing be redesigned in line with section 7.2.4 in the *Austroads Guide to Traffic Management, Part 8: Local Area Traffic Management*, as shown in Figure 6.14. It is also recommended that pedestrian fencing or a planter box be placed where pedestrians were observed crossing prior to the zebra crossing. This would need to ensure the maintenance of sight lines for approaching vehicles.



Source: Austroads Guide to Traffic Management, Part 8: Local Area Traffic Management

Figure 6.14: Extract from Austroads Specifying Raised Crossing Dimensions

**6.6 CROSSING OPPORTUNITY PITTWATER ROAD TO NORTH STEYNE VIA CARLTON STREET**

The issue of crossing Pittwater Road and subsequently North Steyne, at or within proximity to Carlton Street, was raised. The main concern was that there was no existing pedestrian crossing at these locations.

Residents were concerned that it was too dangerous to cross Pittwater Road, especially with children, and that the nearest safe place to cross was Pine Street or Raglan Street, 220m North and 320m South of Carlton Street respectively. Two proposed locations for crossings are shown in Figure 6.15 below.



Source: Based on Google Maps

**Figure 6.15: Proposed Location for Pedestrian Crossing - Carlton Street**

To allow safe crossing at Pittwater Road the intersection would need to be converted to a fully signalised intersection (traffic lights). This would allow for safe crossing for both those less mobile pedestrians and parents crossing with prams or children. In conjunction with the signalised intersection, a pedestrian refuge would need to be installed at North Steyne just north of Carlton Street. A concept design for the proposed crossings are shown in Figure 6.16.





Source: Based on Google Maps

**Figure 6.16: Concept Design Pedestrian Infrastructure Carlton Street**

The combination of the signalised intersection and pedestrian refuge creates a safe path along Carlton Street from Pittwater Road to North Steyne. The installation of this infrastructure may impact parking availability in the area and the relocation of a bus stop on North Steyne. This solution would be costly and potentially have pedestrians crossing in conflict with bicycles on the shared path, so the design would need to consider pedestrian and cyclist interaction.

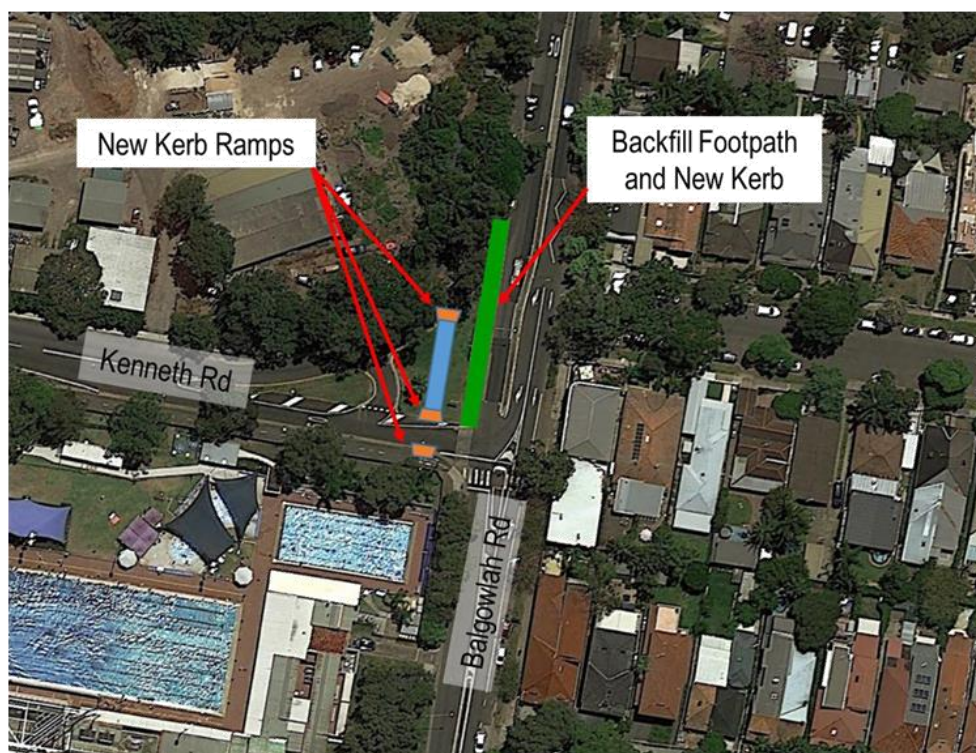


## 6.7 BALGOWLAH ROAD AND KENNETH ROAD INTERSECTION

Specific issues were raised regarding the intersection of Kenneth Road and Balgowlah Road. Specific issues included:

- vehicles failing to stop at the crossing;
- vehicle speeds; and
- vegetation and cracked pavement on the north-western corner.

It is recommended that the footpath along the slip lane island should be filled in and replaced with a new path on the island that would line up with the kerb ramp on the northern side of the intersection. This is shown in Figure 6.17.



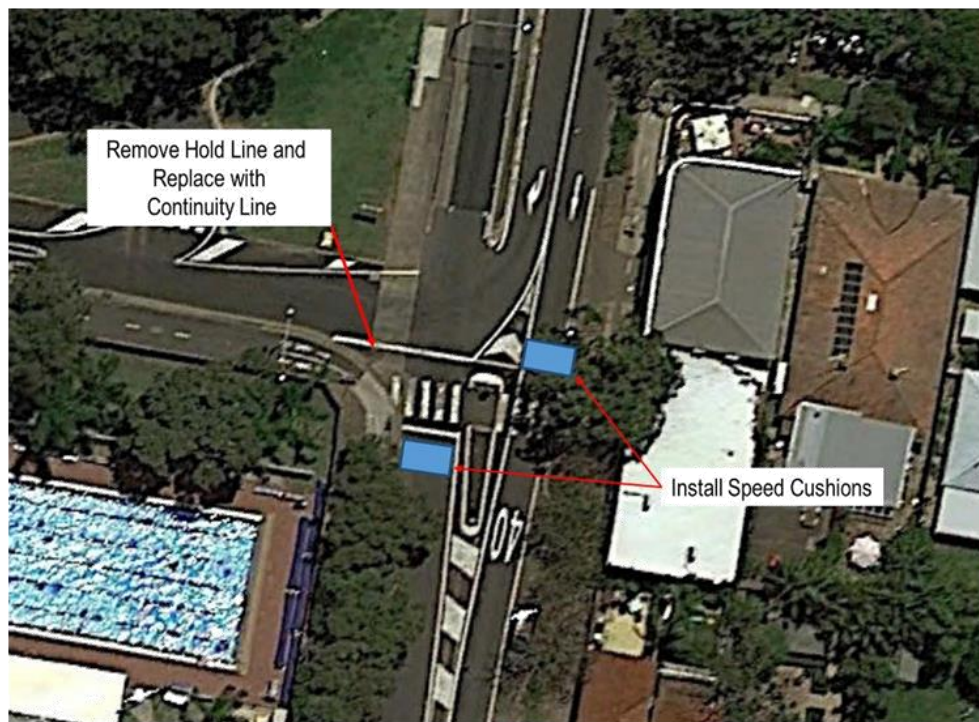
Source: Based on Google Maps

**Figure 6.17: Concept Design for Balgowlah Road and Kenneth Road Footpath**

Further to these changes, two options are discussed below.

### 6.7.1 Option 1 Reconfigure Current Crossing

There are two stop lines on the northbound approach that may lead to confusion for pedestrians and motorists. To improve compliance at the crossing, it is recommended to remove the northern stop line and replace it with a continuity line (broken line). In conjunction with changes to linemarking, it is recommended that speed cushions be installed immediately south and north of the crossing on the western and eastern sides of the road respectively. This will reduce confusion for drivers and lessen the likelihood that they will stop over the crossing or roll through the stop sign. The road cushions are to cause drivers to slow down and therefore increase the safety for pedestrians using the crossing in question. Figure 6.18 shows the changes for Option 1 below.



Source: Based on Google Maps

**Figure 6.18: Option 1 Concept Design Reconfiguration Balgowlah Road Pedestrian Crossing**

#### 6.7.2 Option 2 Relocation of Crossing

Option 2 recommends the zebra crossing be relocated 20 metres south along Balgowlah Road. This option would give drivers room to stop between the crossing and the stop line, reducing the likelihood for a driver to stop across the zebra crossing. It also increases visibility for pedestrians crossing, as vehicles turning into Kenneth Road from Balgowlah Road are less likely to obstruct the view of pedestrians. Although the new location has a decreased risk to pedestrians, some users may be less likely to use the crossing, as they would have to change path from the desired path of travel. The installation of the new crossing may also require removal of some parking near the Noahs Ark Child Care Centre and Manly Andrew Boy Charlton Swim School.



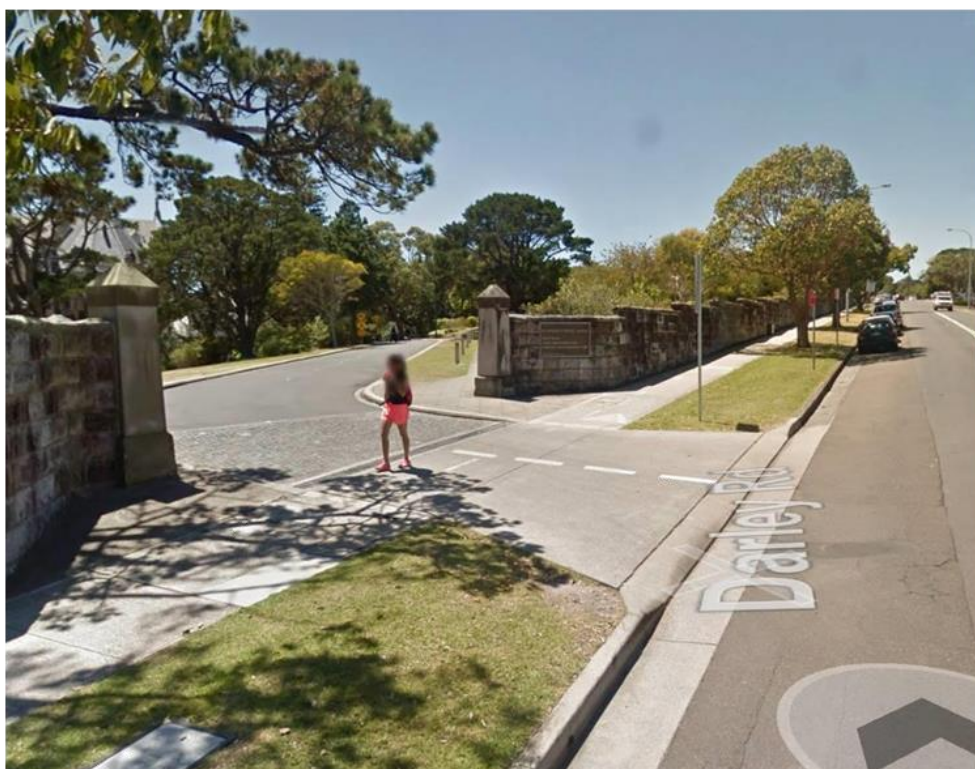


Source: Based on Google Maps

Figure 6.19: Option 2 Concept Design Relocation of Balgowlah Road Pedestrian Crossing

## 6.8 DARLEY ROAD SHARED PATH

From the audit, it was observed that the shared path along the eastern side of Darley Road between Marshall Street and Bluefish Drive lacked proper linemarking and signage. Figure 6.20 shows an example of where the path crosses a driveway. There is a lack of pavement markings to warn the driver of the potential cyclists along the path. The lack of signage and markings poses a risk to cyclists as stated above and for pedestrians who may not be aware of cyclists on the path.



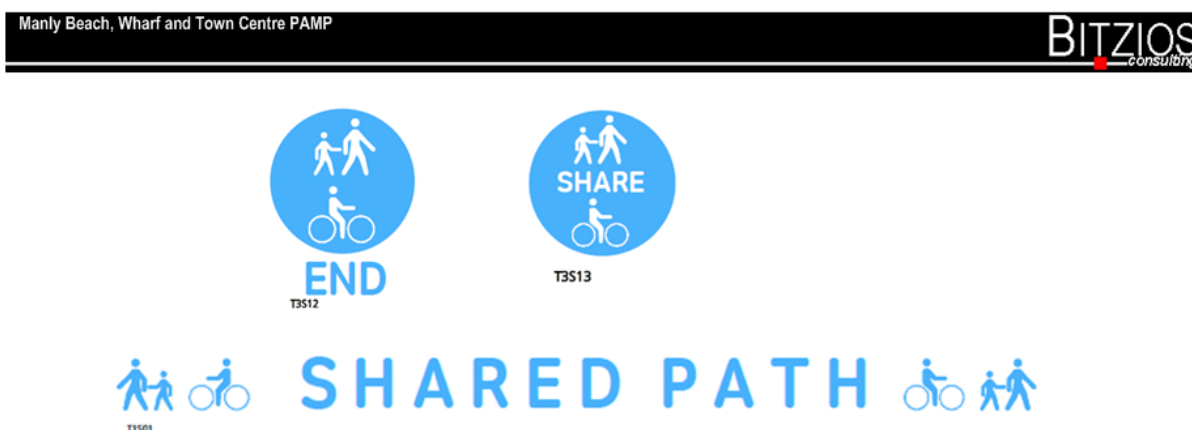
Source: Google Street View

**Figure 6.20: Example of Shared Path Crossing Driveway Darley Road**

It is recommended that signage be installed at the beginning of the shared path. This will alert pedestrians to the shared nature and make them more alert to cyclist who may pass them on the path. Similarly, signage needs to be put in place at the end of the path to direct cyclist that the shared path ends at Bluefish Drive. It is also recommended that linemarking be put in place along the length of the path to indicate to cyclists and pedestrians the shared use of the path. Examples of these markings are shown in Figure 6.21.

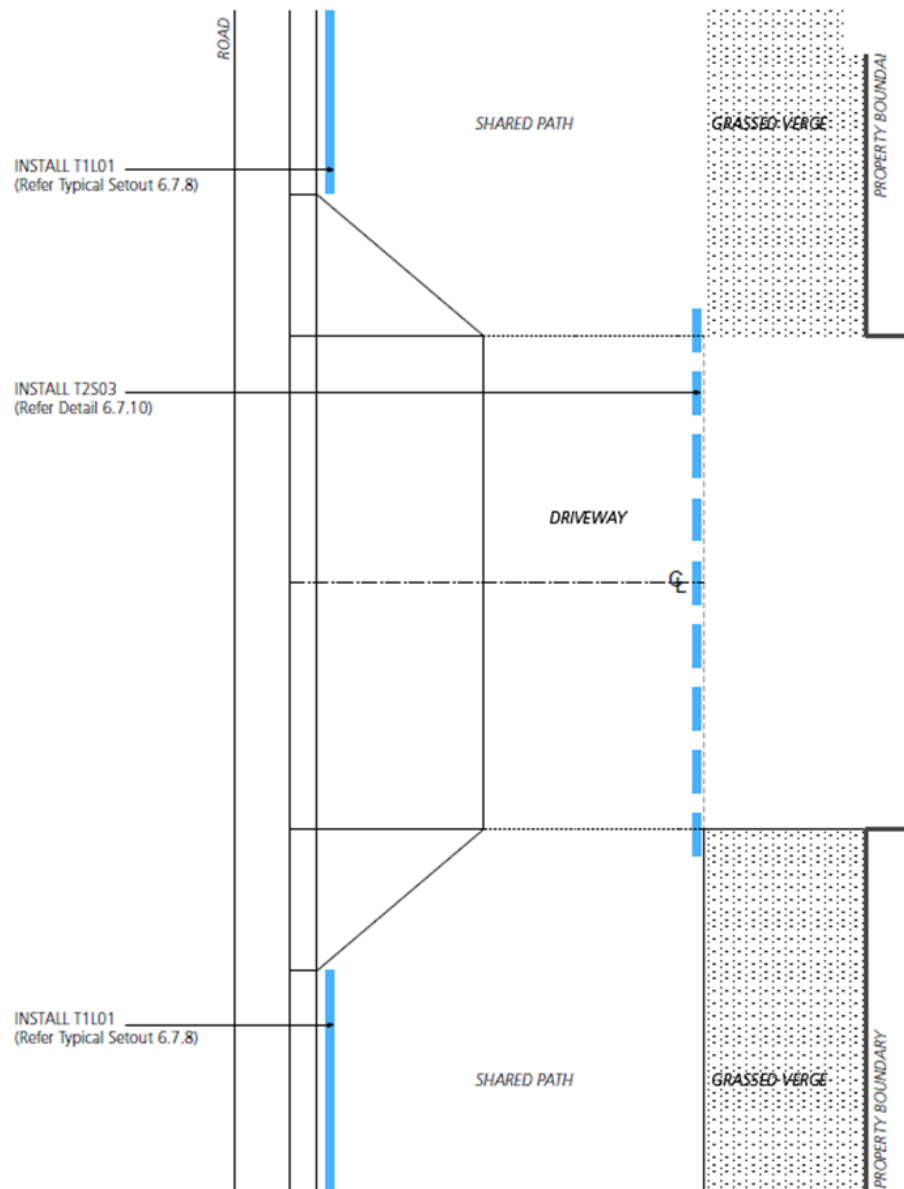
Similarly, markings should be installed across driveways to indicate to drivers that the shared path crosses their path, an example based on the *City of Sydney Pathways Pavement Markings Standards* as shown-in Figure 6.22.





Source: City of Sydney Pathways Pavement Markings Standards

**Figure 6.21: Examples of Linemarking for Shared Paths**



Source: City of Sydney Pathways Pavement Markings Standards

Figure 6.22: Example Detail for Shared Path Crossing a Driveway

## 6.9 MANLY BEACH FORESHORE SHARED PATH

The shared path that runs the length of the Manly Foreshore was identified as having issues with missing linemarking. An example can be seen below in Figure 6.23.

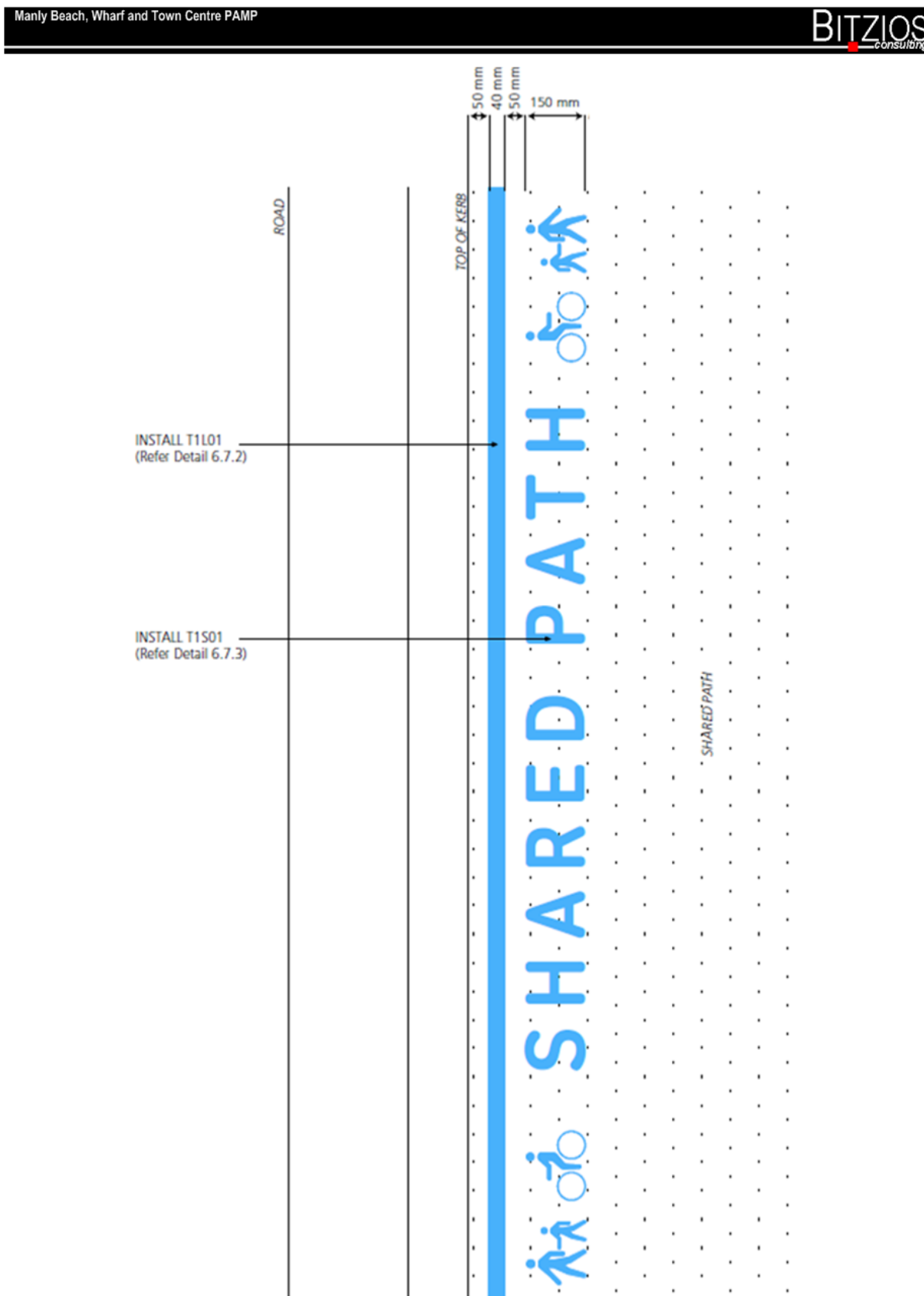


**Figure 6.23: Manly Foreshore Shared Path Missing Linemarking**

As shown in Figure 6.23, shared path users currently interact with people exiting cars or crossing the road, which is located next to the shared path. Pedestrians were observed stopping in the middle of the shared path unaware of shared path users, cyclists and pedestrians using the shared path.



To resolve this issue, it is proposed that the City of Sydney Pathways Pavement Markings Standards be implemented by Northern Beaches Council along the length of the shared path. As recommended in section 6.8, the shared path should have linemarking consistent with Figure 6.21 and Figure 6.22. In conjunction, Figure 6.24 gives an example of the linemarking to be used in areas where there is a high likelihood of pedestrians conflicting with users of the shared path, an example of this being the area directly opposite the marked zebra crossing at Denison Street.



Source: City of Sydney Pathways Pavement Markings Standards

Figure 6.24: Example of Linemarking at High Pedestrian Area

## 6.10 RIALTO LANE

Rialto Lane was identified as having a higher risk to pedestrian safety due to the combined loading zone and pedestrian use. Changes have already been made to the area to pedestrianise the laneway; however, due to the high volume of cars and delivery vehicles, significant risk still exists for pedestrians.

According to the current Urban Design Guidelines from Northern Beach Council, there is a plan to enhance street/lane frontage to Rialto Lane, as such future developments will be required to incorporate active frontage. Thus, any development submitted after April 2002 will be subject to these guidelines.



Source: Google Street View

**Figure 6.25: View of Rialto Lane from Path to The Corso**

It is recommended that wayfinding signage be installed in Rialto Lane to direct pedestrians from Rialto Lane through to The Corso, to the supermarket and the Manly Beach Foreshore. Currently, there is little shopfront area within the lane itself. Wayfinding will reduce the risk to pedestrians by directing them away from areas of little interest; as development continues the wayfinding can be updated to include the new businesses. To improve pedestrian safety further, two strategies are discussed below.

### 6.10.1 Strategy 1 Linemarking

Strategy 1 includes the addition of linemarking to the pavement, outlining the location of loading zones adjacent to the building's loading docks in Rialto Lane. This would only be required for developments with the requirement for a loading dock under the DCP. Sections of Rialto Lane not requiring a loading zone should be marked as no stopping to allow for better pedestrian and vehicle movement.

### 6.10.2 Strategy 2 Restricted Loading Times

Similar to a report compiled by GTA Consultants, Strategy 2 recommends the restriction of loading times in Rialto Lane to late in the evening and early morning hours, e.g. 12:00am -6:00am. Restricting the loading times to the period specified will reduce the risk to pedestrians given that there is likely to be little or no pedestrian activity during the specified period. Restricting loading times may affect smaller business, and consideration should be given to negotiate reasonable changes to the time period given with conditions dictating loading activities be during a period of low pedestrian activity.



#### 6.10.3 Future Works – Strategic Future Growth Plan

It is recommended that future developments have an on-site loading dock included, as provided for in the DCP. Inclusion of a loading dock will reduce the number of vehicles stopping in the laneway to offload goods.

## **6.11 MARKED PEDESTRIAN CROSSINGS (ZEBRA CROSSING)**

The ability to cross safely at marked pedestrian crossings was raised, both during consultation and during the site audits, with particular concern for safe use of the marked crossings at night. As there is a high risk to pedestrian safety when crossing, individual audits of the marked crossings in question were undertaken. An audit was undertaken at the following locations:

- Intersection of East Esplanade and Victoria Parade;
- Intersection of North Steyne and Denison Street;
- Intersection of North Steyne, Collingwood and Bridge Road;
- Intersection of North Steyne and Pacific Street;
- Raglan Street between Short Street and Central Avenue;
- Slip Lane, Sydney Road and Belgrave Street;
- The Corso and Whistler Street (adjacent to the Town Hall);
- Intersection of South Steyne and Victoria Parade;
- Intersection of South Steyne and Wentworth Street; and
- Intersection of North Steyne and Pine Street.

Each audit was undertaken during daylight and night-time conditions in order to assess visibility, lighting, linemarking, and signage.

The issues identified at each location are discussed below. Crossings not discussed below were found to have no issue of concern at the time of the audit.

### **6.11.1 East Esplanade and Victoria Parade**

The marked crossing on East Esplanade was not well lit, so the crossing and pedestrians using the crossing were difficult to see. Pedestrians approaching from the Foreshore were also observed to be obscured by vegetation located at the edge of the road.

To resolve the issues observed, it is recommended that further advice be sought from an appropriate lighting consultant regarding installation of adequate lighting fixtures. It is recommended that vegetation be managed to ensure pedestrian visibility.

### **6.11.2 North Steyne and Denison Street**

The marked crossing at this location was not well lit, so the crossing and pedestrians using the crossing were difficult to see. It is recommended that further advice be sought from an appropriate lighting consultant regarding installation of adequate lighting fixtures.

### **6.11.3 North Steyne, Collingwood and Bridge Road**

The marked crossing at this location was not well lit, so the crossing and pedestrians using the crossing were difficult to see. In particular, the linemarking was difficult to see in low light levels. Therefore, drivers might not see the crossing until they are very close to the crossing. It is recommended that further advice be sought from an appropriate lighting consultant regarding installation of adequate lighting fixtures.

Please refer to Section 6.4 regarding other recommendations for improvements at this location.

### **6.11.4 North Steyne and Pacific Street**

The sign located on the eastern side of North Steyne was partially concealed by vegetation. It is recommended that vegetation be pruned to ensure the visibility of signage.

### **6.11.5 Raglan Street**

Following the audit, the crossing was found to be non-compliant with *AS1742 Part 10: Pedestrian control and protection* and *Roads and Maritime Supplement to Australian Standard 1742 Manual of Uniform Control Devices parts 1-15 Version 2.4*. AS1742 and the supplement require double white centrelines on

each approach to the crossing, with a minimum length of 20 metres and Bi-directional Raised Reflective Pavement Markers at 5 metre spacing. As shown in Figure 6.26 below, the Raglan Street crossing does not currently meet this requirement.



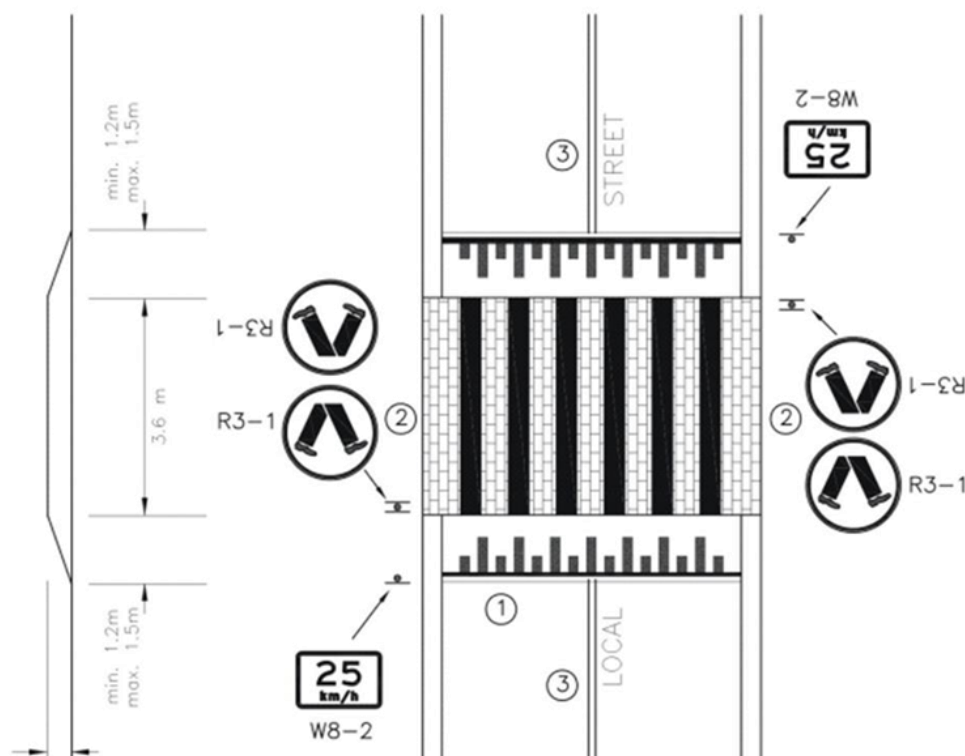
**Figure 6.26: Photo of Raglan Street Pedestrian Crossing**

It is recommended that the linemarking for the crossing in question be installed in accordance with AS1742 Part 10: Pedestrian control and protection and Roads and Maritime Supplement to Australian Standard 1742 Manual of Uniform Control Devices parts 1-15 Version 2.4.

Further to this, signage located on the southern side of the crossing was partially concealed by vegetation. It is recommended that vegetation be pruned to ensure the visibility of signage.

In addition to the issues raised during the audit, significant concern has been raised regarding vehicles failing to stop resulting in near misses, particularly vehicles on the western approach. A review was conducted of the signage and sightlines on approach to the marked crossing and no significant issues were identified. However, given the proximity of the crossing to a school and the concerns raised, the installation of a wombat crossing has been discussed as an option to increase pedestrian safety, an example of which can be seen in Figure 6.27.





Source: Austroads Guide to Traffic Management, Part 8: Local Area Traffic Management

**Figure 6.27: Example of a Wombat Crossing**

Section 7.2.4 in the *Austroads Guide to Traffic Management, Part 8: Local Area Traffic Management* recommends the installation of wombat crossings at mid-block locations, especially near schools, as a means to reduce vehicle speeds and reduce pedestrian-vehicle conflicts. Given the previous stated concerns, the installation of a wombat crossing is seen as an appropriate measure for reducing risk to pedestrians crossing at this location. There may be potential issues with the installation of a raised crossing concerning the bicycle lane that runs along Raglan Street. It is recommended, as outlined in the Austroads guidelines, that the wombat crossing have a ramp gradient of 1:15 to 1:20. To reduce potential conflict between pedestrians and bicycles when crossing, a 'bicycles give way to pedestrians' sign should be installed on both approaches in conjunction with a hard stop line to indicate to cyclists that pedestrians have right of way.

## 6.12 SIGNALISED MID-BLOCK CROSSING DARLEY ROAD AND THE CORSO

Issues surrounding the signal timing of the mid-block crossing at The Corso and Darley Road was raised, indicating that a longer cycle time may be required.

An audit was conducted of the crossing on a typical weekday during peak and off-peak times. It was observed that the cycle time was adequate, allowing all pedestrians to cross and minimising disruption to the flow of traffic through the intersection.

On occasion, improper use of the crossing was observed. This behaviour has the potential to increase the risk of a crash occurring. It is recommended that Council undertake an awareness and education campaign on the use of signalised crossings.

### 6.13 INTERSECTION OF BELGRAVE STREET AND THE CORSO

During the consultation process, the signalised crossing across East Esplanade at the intersection of Belgrave Street and The Corso was raised as an issue. On many occasions, pedestrians were observed to cross the intersection against a red don't walk signal, putting themselves at risk and creating congestion for motorists. This behaviour was observed during peak periods during a site visit.

A potential solution to the issues surrounding the crossing at the intersection is installation of a countdown timer. A countdown timer would allow pedestrians to cross the intersection safely and give pedestrians an indication of the remaining time available to cross. This is likely to reduce the number of pedestrians crossing the road after the red crossing signal has appeared.

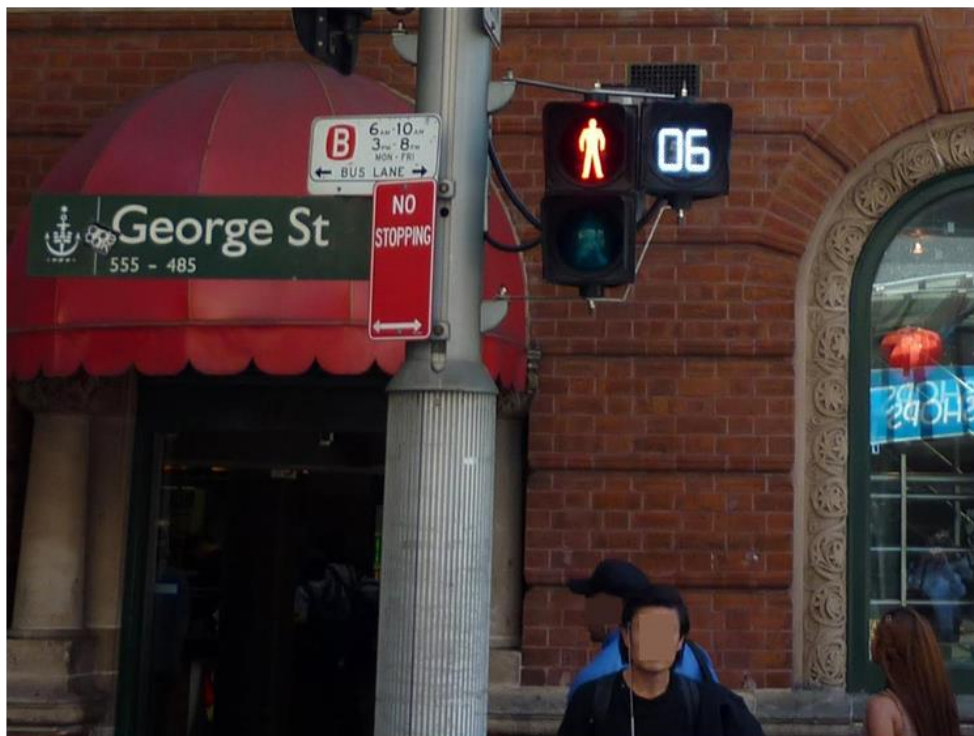
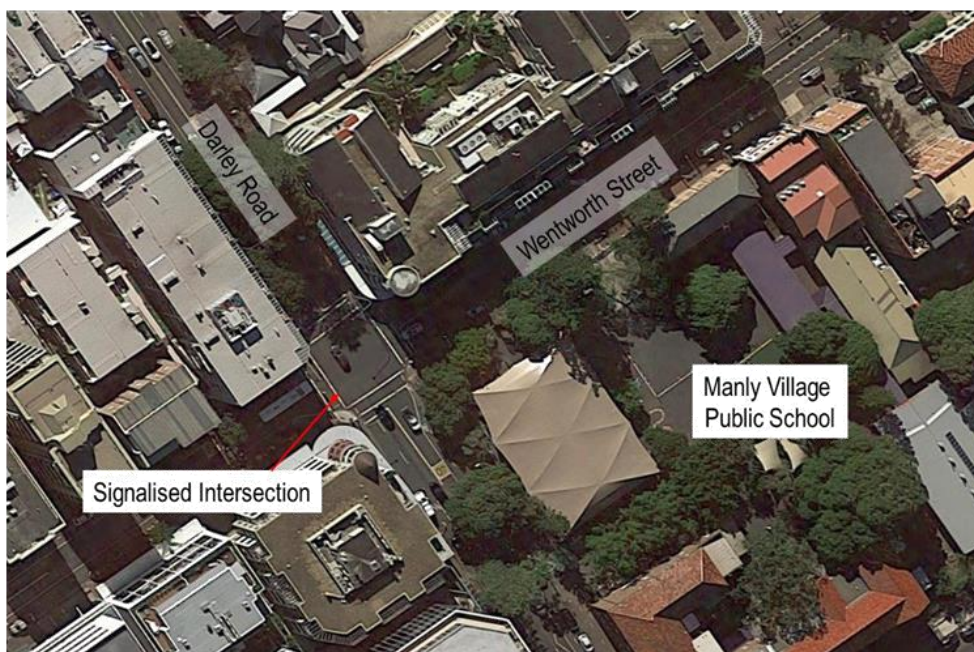


Figure 6.28: Example of a Countdown Timer

In order to install a countdown timer changes would need to be made to current phasing. The pedestrians crossing phase would have to be confined to a separate phase, with all sides of the intersection crossing simultaneously. This is likely to increase the wait time for pedestrians, as the phase(s) associated with crossing will occur less frequently. It is also likely to increase wait time for motorists, as the pedestrian crossing phase will have a longer duration.

### 6.14 SIGNALISED INTERSECTION OF DARLEY ROAD AND WENTWORTH STREET

This particular intersection was raised as an area of concern and potential high risk to pedestrians crossing at all sides of the intersection. The first issue raised was motorists trying to turn the corner whilst a pedestrian was crossing on a green walk signal. This type of behaviour puts pedestrians at a high risk of collision if a driver were to be careless and hit a pedestrian. The second issue raised regarded pedestrians running out into the intersection after other pedestrians had crossed and motorists had begun to drive through the intersection. Of particular note was the proximity of a school where children are potentially more likely to run or walk into the intersection without looking.



Source: Based on Google Maps

**Figure 6.29: Location of Signalised Intersection – Wentworth Street**

It is recommended to reconfigure the existing signal phasing to include pedestrian protection (delaying the green light or vehicles) as a means of reducing risk to pedestrians when crossing at the intersection. As outlined in the Roads and Maritime Services design guideline *Traffic Signal Design: Section 7 Phasing and Signal Group Display Sequence*, specifically Part 7.10.2, "Timed protection should be considered when there is a high proportion of children, elderly, or people with disabilities". Given the proximity to the school and a supermarket, installation of pedestrian protection should be considered.

## 6.15 MANLY LAGOON

### 6.15.1 Lighting

The issues of lack of or insufficient lighting throughout the Manly Lagoon were significant and the lagoon was identified as an area of concern. A site audit was conducted to assess the degree to which the issue effected pedestrian mobility.

The site was inspected in daylight and at night. It was initially assessed in daylight to document the already existing lighting, if any was present, taking note of location and the type of lighting that existed. Following this, the site was inspected at night, when the level of lighting was noted and how the lighting levels affected a pedestrian's ability to access and use the lagoon. It was found that there was already existing lighting infrastructure, as shown in Figure 6.30, although the level of visibility produced and spacing of the lighting was inadequate.





**Figure 6.30: Example of Existing Lighting in Manly Lagoon**

It is recommended that further advice be sought from an appropriate lighting consultant is regarding installation of adequate lighting along the length of the shared path, extending from Pittwater Road to Cameron Avenue and Bridge Road. As a part of this process, consideration should be given to residents abutting the Manly Lagoon, ensuring the lighting solution selected does not cause excessive light pollution.

#### 6.15.2 Shared Path

An audit of the shared path was conducted because of conflict between cyclists and pedestrians using the shared path along Manly Lagoon was raised as an issue of concern. At the time of the audit, a relatively high number of cyclists and pedestrians were noted using the shared path, although there was no apparent conflict from its shared use.

There is a second path worn in by pedestrian and cyclist activity along the foreshore of the lagoon, see Figure 6.31. This indicates that many pedestrians and cyclists may be using an alternative path along the foreshore instead of the shared path.





Source: Based on Google Maps

**Figure 6.31: Evidence of Worn Footpath along Manly Lagoon**

It is recommended a pedestrian survey be undertaken to assess the requirements for changes to be made to the existing infrastructure, in particular the shared path. Furthermore, community feedback should be sought, potentially on location, to assess whether conversion of the worn path to a pedestrian path, separated cycle path or shared path is required.

Dependant on the results of the survey and community feedback two options are available. Each option could be considered as either a separate or a multistage solution.

#### ***Option 1 Widening the Shared Path***

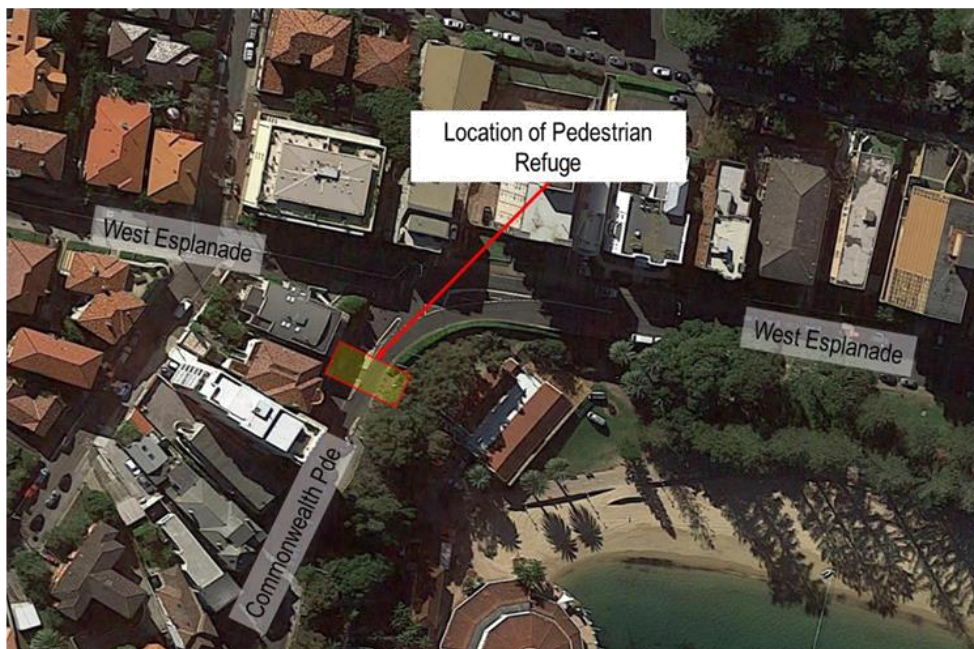
Option 1 is widening the existing shared path be widened to facilitate the large amount of foot traffic using the Lagoon. This would enable cyclist to safely pass pedestrians and give ample room for increases in pedestrian traffic.

#### ***Option 2 Installation of Pedestrian Path***

Option 2 is converting the worn path along the foreshore of the lagoon, as shown in Figure 6.31, to a pedestrian path, separated cycle path or shared path. This would enable all pedestrians to utilise the section of path and increase the capacity of the lagoon for pedestrians. It should be noted that existing the shared path should remain for shared use in conjunction with the creation of the alternative path.

**6.16 PEDESTRIAN REFUGE COMMONWEALTH PARADE AND WEST ESPLANADE**

Concerns were raised about the safety of pedestrians when crossing Commonwealth Parade 20 meters south of West Esplanade. The pedestrian refuge follows a sweeping curve after turning off West Esplanade.



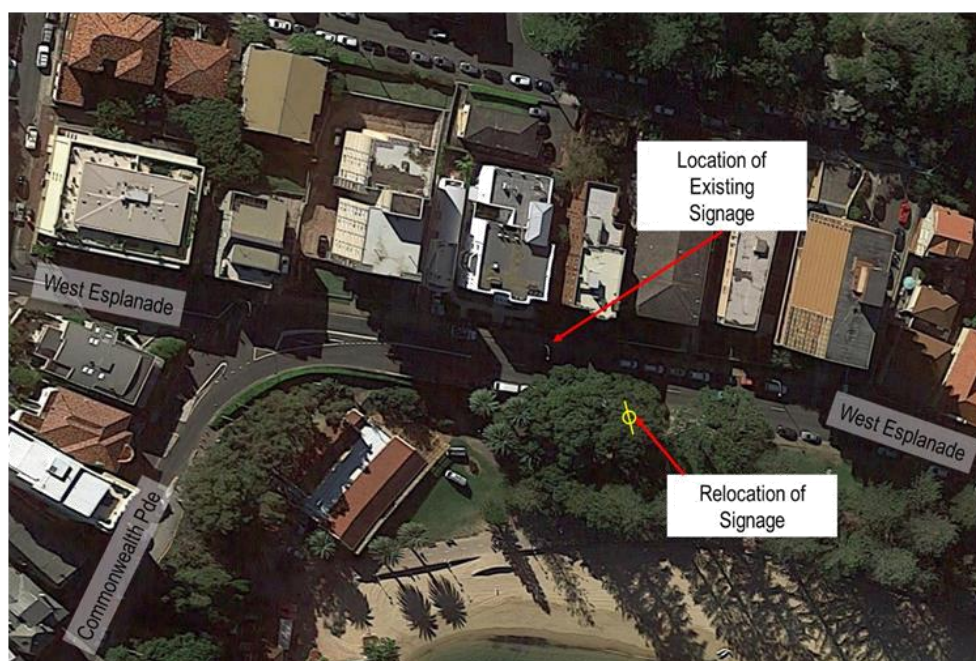
Source: Based on Google Maps

**Figure 6.32: Location of Pedestrian Refuge Commonwealth Parade**

An audit of the refuge was undertaken by Bitzios Consulting and found the pedestrian refuge warning sign to be in a location that was not ideal. As seen in Figure 6.34, the Pedestrian refuge warning sign is located on the right-hand side of the road for traffic on approach to the refuge. *AS1742 Part 10: Pedestrian control and protection* and *Roads* shows the position of the warning sign on the left-hand side of approaching traffic. During the audit, it was also found that the sightlines on approach to the refuge increased the risk to pedestrians as there was little time for a driver to react to pedestrians crossing at the refuge.

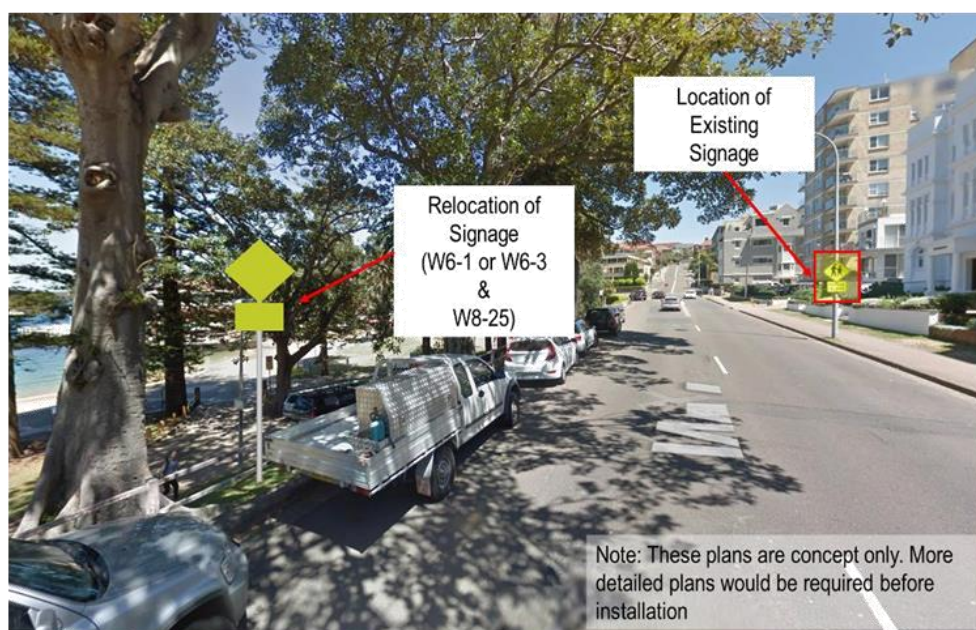
It is recommended that the existing pedestrian refuge warning sign on the Eastern approach be relocated to the left-hand side of the road; a concept design can be seen in Figure 6.33 and Figure 6.34. The recommendation would not eliminate the risk to pedestrians but would greatly reduce the risk by making drivers more aware of the potential hazard ahead.





Source: Based on Google Maps

Figure 6.33: Concept Design for Commonwealth Parade Refuge



Source: Based on Google Street View

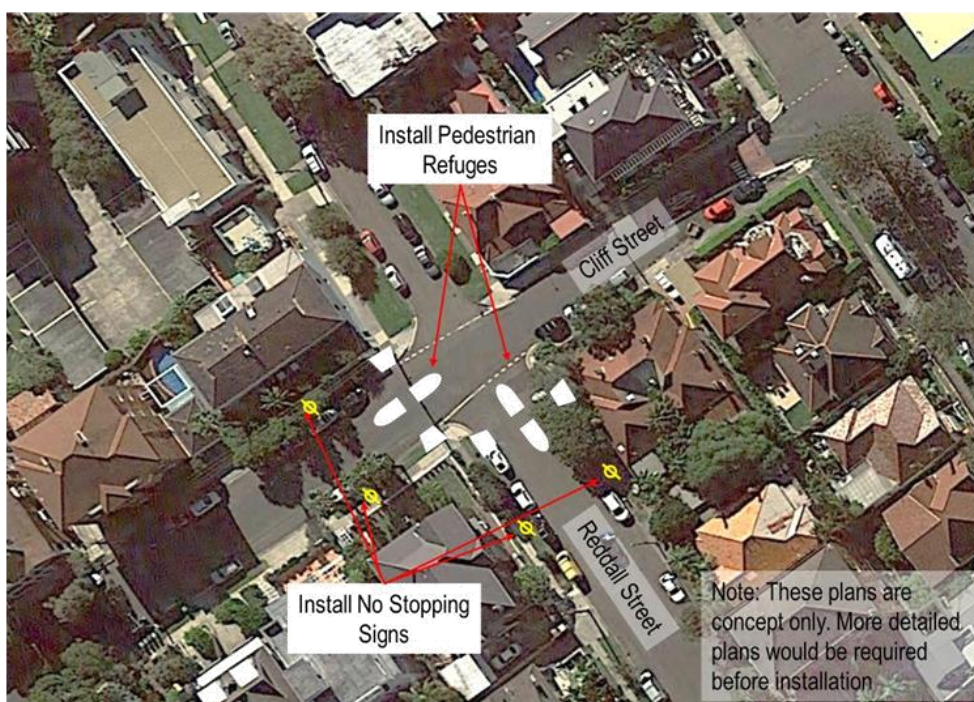
Figure 6.34: Street View of Concept Plan for Commonwealth Parade



## 6.17 REDDALL STREET AND CLIFF STREET

The intersection of Reddall Street and Cliff Street was identified as being dangerous for pedestrians to navigate. The intersection is located at the crest of a steep gradient and having relatively wide cross-section, south along Reddall Street and in both directions along Cliff Street. These factors make it difficult for pedestrians to see the approaching vehicles when crossing. This is especially apparent for those who are less mobile and parents walking with children as these pedestrians in particular may require more time to cross an intersection.

It is recommended that pedestrian refuges be installed on the western approach along Cliff Street and the southern approach along Reddall Street. Installation of pedestrian refuges at this intersection will allow pedestrians to cross and safely stop halfway across the street if a vehicle comes into view and thus give less mobile pedestrians more time to cross safely. Sight distances will also be increased after installation as the refuge will require no stopping signs to be installed, giving pedestrians a view that is unobstructed by parked vehicles. A concept plan detailing the proposed refuge islands can be seen below in Figure 6.35.



Source: Based on Google Maps

Figure 6.35: Concept Design Refuge Island Reddall and Cliff Street Intersection



## **7. DETAILED RECOMMENDED WORKS PROGRAM**

### **7.1 WORKS PRIORITY**

A priority level has been assigned to each recommended action, taking into consideration its contribution to pedestrian safety, ease of accessibility and the amenity of the surrounding environment. Priority levels were assigned as follows:

- **High Priority (H) = Essential for pedestrian safety:**
  - for issues that require short term action (0-5 years);
  - for issues that would likely result in pedestrians having to use heavily trafficked streets due to a lack of footpath, deficient pedestrian facilities, or misleading pavement markings or street signage;
  - for locations where there are high pedestrian volumes as well as high traffic volumes that should maintain/improve the level of pedestrian access and mobility in accordance with design standards;
  - for locations where kerb ramps are missing at pedestrian signal crossings at heavily trafficked roads;
  - for areas such as shopping centre car parks, where traffic directional signage is unclear and likely to impede pedestrian safety; and
  - for some locations where there is very limited footpath provision near a major pedestrian attractor or generator;
- **Medium Priority (M) = Desirable for pedestrian safety, convenience or amenity:**
  - for issues that require medium term works (5-10 years)
  - for issues that would likely result in pedestrians having to use local low-trafficked streets due to a lack of footpath, deficient pedestrian facilities, or misleading pavement marking or street signage;
  - for faded pedestrian crossings or narrow kerb ramps across roads through town centres; and
  - for trip hazards near schools, child care centres, or aged care facilities;
- **Low Priority (L) = Little impact on pedestrian safety, desirable for pedestrian convenience or amenity:**
  - for issues that require longer term works (10-25 years);
  - for minor footpath deficiencies, such as bad lip heights or narrow kerb ramps, in local streets;
  - for outdated symbol signs or faded traffic signs;
  - for minor bus stop deficiencies, such as missing shelters, seating, or bin provision; and
  - for lack of footpath provision in low pedestrian volume streets, where a footpath exists on the other side of the road.

#### **7.1.1 Priority Criteria**

The observed issues were sorted against the analysis criteria, in accordance with the Roads and Maritime Services' *How to Prepare a Pedestrian Access and Mobility Plan*, which was used to categorise the issues by levels of severity and importance. By evaluating each issue against set criteria across a range of categories, a consistent and balanced approach to identifying the issues that require more immediate attention was developed. The criteria and score ranking system are shown in Table 7.1 and Table 7.2.

**Table 7.1: Criteria for Creating Priority Scores for Site Audit Photographs**

ID	Scoring Criteria	Score
C1	Connectivity to pedestrian generator/attractor	High Priority Medium Priority
C2	Proximity to Generators/Attractors	< 250m > 350 - 500 m > 500 - 1000m > 1000m
C3	Pedestrian crash history	> 3 reported per year 3 reported per year 2 reported per year 1 reported per year 0 reported per year
C4	Concerns from community feedback	5 or more responses less than 5 responses no responses
C5	Relation to road hierarchy	State road Arterial/sub-arterial Collector road Local street/Pedestrian Mall
C6	Land Use	School / aged care Commercial / retail Residential
C7	Pedestrian Safety	Essential Desirable Little impact
C8	Pedestrian Desire Lines	Strong desire line Medium usage Very little use

**Table 7.2: Works Priority Scores Based on Criteria for Site Audit Photographs**

Score	Works Priority
>50	High
30-50	Medium
<30	Low

## 7.2 COST ESTIMATES

The estimated costs of treatments are based on unit rates supplied by Northern Beaches Council, rates used in previous PAMP studies conducted by Bitzios Consulting for other local councils in NSW and the Independent Pricing and Regulatory Tribunal Local Infrastructure Benchmark Costs. The list of unit costs are shown in Table 7.3. The costs presented are indicative and non-inclusive of associated overhead costs and as such should be used as a guide only.

**Table 7.3: Indicative Unit Costs**

Item	Unit Cost
Install kerb ramp	\$2,000.00 per unit
Installation of footpath	\$190.00 per m <sup>2</sup>
Install shared use path	\$210.00 per m <sup>2</sup>
Pedestrian refuge island (site specific)	\$25,000.00 per unit
Clear vegetation	\$1.10 per m <sup>2</sup>
Linemarking	\$5.00per m
Install lighting	\$1,000.00 per unit
Install handrails	\$200.00 per unit
Traffic sign	\$200.00 per unit
Pavement grinding	\$25.00 per unit
Removal of debris or refuge	\$77.00 per m <sup>2</sup>
Installation of grated drains	\$200.00 per unit
Resurfacing and levelling of pavement	\$ - per m <sup>2</sup>
Installation of new service cover	\$ - per unit
Installation of bike rack	\$1,121.00 per unit
Installation of compliant parking	\$6,300.00 per unit
Removal of obstacle	\$0.00 per unit
Installation of reflective strip	\$ - per m
Installation of garden edging	\$45.00 per m
Restricting time allotted for use of loading area (new signage)	\$200.00 per unit
Installation of new drain cover	- per unit
Installation of sprayed bitumen surface	\$2.00 per m <sup>2</sup>
Removal of advertising	\$ - per unit
Installation of convex mirror	\$ - per unit
Installation of rubber speed cushion	\$2,000.00 per unit

Note: there some items for which no costing data was available and, as such, have been given a value of "\$ - ". These items have therefore not been included in the total cost estimates.

Presented below, in Table 7.4, are the recommended treatments that are considered High priority works for the study area included in the PAMP. The full list of inspected priority routes with recommended works for Northern Beaches Council are provided in Appendix F. The summary of estimated costs can be found in Appendix G.



### 7.3 EXAMPLES OF KEY UPGRADES

Table 7.4: Manly PAMP High Priority Issues, Recommended Treatments, and Estimated Costs

Street	Location	Issue	Priority	Treatment	Cost
Balgowlah Road	North of Golf Pde	Ponding at northern kerb ramp (golf parade)	High	Build compliant kerb ramp	\$2,000.00
Balgowlah Road	South of Golf Pde	Ponding at southern kerb ramp (golf parade)	High	Build compliant kerb ramp	\$2,000.00
Balgowlah Road	North of Rolfe St	Kerb ramps near speed hump (pacific parade)	High	Build compliant kerb ramp	\$2,000.00
Balgowlah Road	North of Golf Pde	Potential ponding location at kerb ramp	High	Build compliant kerb ramp	\$2,000.00
Belgrave Street	South of Sydney Rd	Crossing facing south	High	Build compliant kerb ramp	\$2,000.00
Belgrave Street	South of Sydney Rd	Lip on kerb ramp	High	Build compliant kerb ramp	\$2,000.00
Commonwealth Parade	West of W Esplanade	Kerb ramp not aligned, no kerb ramp at southern end of crossing	High	Build compliant kerb ramp	\$2,000.00
Commonwealth Parade	West of W Esplanade	Lack of kerb ramp	High	Build compliant kerb ramp	\$2,000.00
Commonwealth Parade	West of W Esplanade	No kerb ramp for access to tourist bus zone 2	High	Build compliant kerb ramp	\$2,000.00
North Steyne	South of Pine St	Kerb ramps do not align pine street	High	Build compliant kerb ramp	\$2,000.00
North Steyne	North of Carlton St	Hole in pavement	High	Resurface and level footpath/pavement	\$0.00
North Steyne	South of Carlton	Poor accessibility	High	Build compliant disabled parking	\$2,000.00
North Steyne	South of Collingwood St	Kerb ramps and refuge crossing	High	Build compliant kerb ramp	\$2,000.00
North Steyne	South of Raglan St	Non-compliant pedestrian refuge	High	Build compliant refuge	\$25,000.00
North Steyne	North of Victoria Pde	Kerb ramps do not align Denison street	High	Build compliant kerb ramp	\$2,000.00
North Steyne	South of Steinton St	Kerb ramps do not align Steinton Street	High	Build compliant kerb ramp	\$2,000.00
North Steyne	North of Steinton St	Kerb ramps do not align Steinton Street	High	Build compliant kerb ramp	\$2,000.00
North Steyne	North of Carlton St	Kerb ramps do not align Carlton Street	High	Build compliant kerb ramp	\$2,000.00
Pittwater Road	North of Eurobin Ave	School zone sign obscured by trees	High	Clear Vegetation	\$22.00

Street	Location	Issue	Priority	Treatment	Cost
Pittwater Road	South of Eurobin Ave	Evidence of ponding near kerb ramp	High	Build compliant kerb ramp	\$2,000.00
Pittwater Road	South of Denison St	Kerb ramps not aligned	High	Build compliant kerb ramp	\$2,000.00
Pittwater Road	South of Carlton	Kerb ramps not aligned	High	Build compliant kerb ramp	\$2,000.00
Pittwater Road	South of Carlton	Kerb ramps not aligned	High	Build compliant kerb ramp	\$2,000.00
Pittwater Road	North of Carlton St	Uneven footpath near kerb	High	Build compliant kerb ramp	\$2,000.00
Pittwater Road	North of Carlton St	Uneven footpath near kerb	High	Build compliant kerb ramp	\$2,000.00
Pittwater Road	South of Alexander St	Kerb ramp to driveway	High	Build compliant kerb ramp	\$2,000.00
Pittwater Road	North of Alexander St	Kerb ramp facing intersection	High	Build compliant kerb ramp	\$2,000.00
Pittwater Road	South of Alexander St	Uneven road surface at crossing	High	Resurface and level footpath/pavement	\$-
Pittwater Road	South of Pine St	Cross way has half kerb ramp	High	Build compliant kerb ramp	\$2,000.00
Pittwater Road	North of Carlton St	Ponding at kerb ramp	High	Build compliant kerb ramp	\$2,000.00
Pittwater Road	North of Denison St	Uneven pavement near kerb ramp and base of post	High	Build compliant kerb ramp	\$2,000.00
Pittwater Road	South of Rolfe St	Possible ponding location at kerb ramp	High	Build compliant kerb ramp	\$2,000.00
Pittwater Road	East of Balgowlah Rd	Questionable parking layout	High	Build compliant disabled parking	\$6,300.00
Pittwater Road	East of Balgowlah Rd	Questionable parking layout	High	Build compliant disabled parking	\$6,300.00
Pittwater Road	South of Raglan St	Kerb ramps do not line up across Pittwater Road	High	Build compliant kerb ramp	\$2,000.00
Pittwater Road	South of Raglan St	Kerb ramps do not line up across Raglan Street	High	Build compliant kerb ramp	\$2,000.00
Raglan Street	West of Ocean Rd	No kerb ramps	High	Build compliant kerb ramp	\$2,000.00
Raglan Street	West of Ocean Rd	Raised service cover on road at crossing location	High	Level service cover flush with surrounds	\$-
Raglan Street	West of Ocean Rd	Uneven road surface at crossing location	High	Resurface and level footpath/pavement	\$-
Raglan Street	East of Ocean Rd	Crossing with kerb extension	High	Build compliant kerb ramp	\$2,000.00

Street	Location	Issue	Priority	Treatment	Cost
Raglan Street	West of Augusta Ln	No kerb ramp	High	Build compliant kerb ramp	\$2,000.00
Raglan Street	West of Kangaroo St	Kerb ramps not aligned	High	Build compliant kerb ramp	\$2,000.00
Raglan Street	West of Kangaroo St	Damaged and uneven footpath and kerb ramp	High	Build compliant kerb ramp	\$2,000.00
Raglan Street	West of Kangaroo St	Raised lip near kerb	High	Resurface footpath/pavement	\$2,000.00
Raglan Street	West of Augusta Ln	Kerb extension crossing	High	Build compliant kerb ramp	\$2,000.00
Raglan Street	East of Lawson Pl	Damaged and uneven road surface at crossing location	High	Resurface and level footpath/pavement	\$-
Raglan Street	West of Birkley Rd	Uneven road surface at crossing location	High	Re-lay and level pavers	\$5,000.00
Raglan Street	East of Birkley Ln	Uneven road surface at crossing location and change in level	High	Resurface and level footpath/pavement	\$-
Raglan Street	West of Birkley Ln	Uneven road surface at crossing location	High	Resurface and level footpath/pavement	\$-
Raglan Street	West of Birkley Rd	Raised edge at kerb ramp	High	Build compliant kerb ramp	\$2,000.00
Raglan Street	East of Birkley Rd	Steep section on kerb ramp	High	Build compliant kerb ramp	\$2,000.00
Raglan Street	East of Lawson Pl	No kerb ramps	High	Build compliant kerb ramp	\$2,000.00
Raglan Street	East of Lawson Pl	Drainage issue at kerb ramp	High	Build compliant kerb ramp	\$2,000.00
Raglan Street	East of Lawson Pl	Difference in level at stairs	High	Resurface and level footpath/pavement	\$-
Raglan Street	West of Whistler St	Two pedestrian crossings in close proximity, one without kerb ramps	High	Build compliant kerb ramp	\$2,000.00
Raglan Street	West of Quinton Rd	No kerb ramps	High	Build compliant kerb ramp	\$2,000.00
Raglan Street	West of Ocean Ln	No kerb ramp	High	Build compliant kerb ramp	\$2,000.00
Short Street	South of Raglan St	No kerb ramps to access parking spaces and driveway 2	High	Build compliant kerb ramp	\$2,000.00
Short Street	South of Raglan St	No kerb ramps to access parking spaces and driveway	High	Build compliant kerb ramp	\$2,000.00
South Steyne	North of Victoria Pde	Kerb ramp not aligned	High	Build compliant kerb ramp	\$2,000.00



Street	Location	Issue	Priority	Treatment	Cost
Sydney Road	West of Eustace St	Uneven footpath and raised edge at kerb near kerb ramp	High	Build compliant kerb ramp	\$2,000.00
Sydney Road	West of Birkley Rd	Kerb ramps not facing each other	High	Build compliant kerb ramp	\$2,000.00
Sydney Road	East of Belgrave St	Sign clutter signs are obscured	High	Remove excess signage, redesign signage from whole systems approach	\$1,000.00
Sydney Road	West of Eustace St	Missing footpath, overgrown vegetation and water runoff	High	Resurface and level footpath/pavement	\$1,250.00
Sydney Road	East of W Promenade	Kerb ramps not aligned	High	Build compliant kerb ramp	\$2,000.00
Sydney Road	East of James St	Signpost on kerb ramp	High	Build compliant kerb ramp	\$2,000.00
Sydney Road	West of George St	Kerb ramps unaligned, kerb blister	High	Build compliant kerb ramp	\$2,000.00
Sydney Road	West of George St	Kerb ramp, kerb blister and gradient	High	Build compliant kerb ramp	\$2,000.00
West Esplanade	East of Rowe St	Missing and loose pavement	High	Re-lay and level pavers	\$2,500.00
Pittwater Road	West of Balgowlah Rd	Missing crossing opportunity	High	Refer to report section 6.1	\$25,000.00*
Bower Lane	East of Bower St	High conflict area with continuous pedestrian traffic	High	Refer to report section 6.2	\$108,000.00
E Esplanade	North of Ashburner St	No crossing opportunity	High	Refer to report section 6.3	\$29,500.00
North Steyne	South of Cameron Ave	Concerns raised about wombat crossing	High	Refer to report section 6.4	\$25,000.00*
Whistler Street	North of The Corso	Concerns raised about wombat crossing	High	Refer to report section 6.5	\$10,000.00
North Steyne	North of Carlton St	No crossing opportunity	High	Refer to report section 6.6	\$800,000.00
Pittwater Road	North of Carlton St	No crossing opportunity	High	Refer to report section 6.6	\$25,000.00
Balgowlah Road	North of Kenneth Rd	Concerns raised about zebra crossing	High	Refer to report section 6.7	\$4,000.00*
Darley Road	South of Marshall St	Shared path lacking proper linemarking and signage	High	Refer to report section 6.8	\$3,500.00
Manly Beach Foreshore	N/A	Entire shared path along foreshore lacking clear linemarking and signage	High	Refer to report section 6.9	\$10,000.00
Rialto Lane	West of South Steyne	High conflict area with continuous pedestrian traffic	High	Refer to report section 6.10	\$5,000.00

Street	Location	Issue	Priority	Treatment	Cost
E Esplanade	North of Victoria Pde	Concerns raised about zebra crossing	High	Refer to report section 6.11	\$2,500.00
North Steyne	North of Denison St	Concerns raised about zebra crossing	High	Refer to report section 6.11	\$2,500.00
North Steyne	South of Collingwood St	Concerns raised about zebra crossing	High	Refer to report section 6.11	\$0.00*
North Steyne	South of Pacific St	Concerns raised about zebra crossing	High	Refer to report section 6.11	\$20.00
Raglan Street	East of Francis Ln	Concerns raised about zebra crossing	High	Refer to report section 6.11	\$50,000.00
Darley Road	South of The Corso	Signal phasing may be too short	High	Refer to report section 6.12	\$0.00
E Esplanade	East of Belgrave St	Improper use of pedestrian signals observed	High	Refer to report section 6.13	\$4,000.00
Darley Road	North of Wentworth St	Concerns raised regarding pedestrian safety	High	Refer to report section 6.14	\$4,000.00
Manly Lagoon	N/A	Lack of lighting observed	High	Refer to report section 6.15	\$50,000.00
Commonwealth Parade	South of West Esplanade	Concerns raised about pedestrian and vehicle sightlines	High	Refer to report section 6.16	\$400.00
Cliff Street	West of Reddall St	Lack of or potentially unsafe crossing opportunity	Medium	Refer to report section 6.17	\$25,000.00
Reddall Street	South of Cliff St	Lack of or potentially unsafe crossing opportunity	Medium	Refer to report section 6.17	\$25,000.00

\*where multiple options exist, the lowest cost has been used for estimation.

\*indicates no costs associated, see costing for North Steyne, south of Cameron Ave.

Based on the preliminary cost estimates, the total cost for all recommended treatments (across priority works and priority routes) is shown in Table 7.5.

**Table 7.5: Cost Estimate Summary by Priority of Issues**

Total	Priority (subtotal)		
	High	Medium	Low
\$2,125,624	\$1,311,831	\$748,085	\$65,708



## 8. FUNDING SOURCES

### 8.1 ROADS AND MARITIME SERVICES

Generally, Roads and Maritime Services will fund works on State Roads including crossings and kerb ramps. State Roads are 100% funded by Roads and Maritime Services, while works on Regional and Local Roads are funded 50/50 by Roads and Maritime Services and Northern Beaches Council. In the last two cases, Roads and Maritime Services contributes funding for road crossing facilities and kerb ramps only.

Within the study area, the following classifications apply for funding purposes:

- State Roads – Belgrave Street, Sydney Road and Pittwater Road; and
- Regional Roads – North Steyne, Raglan Street, Commonwealth Parade, West Esplanade and The Crescent (as detailed in Table 2.1).

All other roads are considered local roads and are under the jurisdiction of Northern Beaches Council.

Further details of Roads and Maritime Services funding can be found in the “Council Projects Funded by the RTA, Memorandum of Understanding” June 2009. The works that are generally eligible for equal contribution between Council and Roads and Maritime Services include:

- Preparation of Pedestrian Access and Mobility Plan
- Upgrade of Existing Pedestrian Infrastructure
  - Kerb Ramps
  - Pedestrian Priority System
- New Pedestrian Crossing Treatment and Facilities
  - New signalised pedestrian access points
  - Shared zone areas
  - Kerb extensions and blisters
  - Raised pedestrian crossings

### 8.2 SECTION 94 CONTRIBUTIONS

The Environmental Planning and Assessment Act 1979 makes allowance for a consent authority to extract money for the provision of public amenity or public services. Should a development increase pedestrian activity or demand then it would be reasonable for Council to seek contribution toward improvements to pedestrian facilities in the area, provided a link between the development and facility can be reasonable shown. Section 94 states:

*“Where a consent authority is satisfied that a development, the subject of a development application, will or is likely to require the provision of or increase the demand for public amenities and public services within the area, the consent authority may grant consent to that application subject to a condition requiring:*

- (a) The dedication of land free of cost; or*
- (b) The payment of a monetary contribution, or both.”*

In relation to the PAMP, Council may consider including some of the works as part of their Section 94 contribution plan.

### 8.3 VOLUNTARY PLANNING AGREEMENTS (VPAs)

VPAs are an agreement between Council and developers that may involve the funding or assistance of pedestrian facility upgrades, expansion, construction, or reconstruction. Any VPA is considered on a case-by-case basis, and it can become an additional funding source for PAMP works.

## 9. IMPLEMENTATION AND MONITORING PROGRAM

The next stages in the PAMP are to:

- organise funding sources to establish a budget and over what timeframe;
- establish an implementation program; and
- monitor implementation of the PAMP and its outcomes.

It is typical to have a monitoring program for the PAMP. This would involve:

- recording of all proposed pedestrian works in a database;
- analysis of crash statistics;
- collection of pedestrian count information; and
- periodic updating of the PAMP every five years.

The monitoring program for the PAMP can include the establishment of an auditing process that assesses and documents the condition of the priority routes established and progress of work recommended in this PAMP regularly. By ensuring a visual audit program is implemented, the quality of the routes can be maintained and any issues can be identified and addressed quickly. Assessments of the routes should be conducted by a person or team of professionals with experience in pedestrian facility design and standards to best identify arising issues and develop a suitable course of action. Priority routes should also be reviewed and updated as new Council works are proposed and land uses change.

10. **PUBLIC RESPONSE**

To be advised



## 11. CONCLUSIONS AND RECOMMENDATIONS

This PAMP presents a plan to improve pedestrian safety and encourage more walking within the Manly Beach, Manly Wharf and Manly Town Centre Study Area in the Manly Local Government Area.

Issues affecting pedestrians were discussed with local businesses and community groups, although the responsiveness of many of these groups was relatively limited. The key pedestrian issues identified were the kerb ramp connectivity and alignment, and the number of trip hazards on footpaths in some locations. Other issues included poor surfaces, overgrown vegetation, and poor sign posting.

High Priority PAMP routes were defined, and a comprehensive field audit was conducted to catalogue issues with local footpaths, kerb ramps, bus stops, and the walking environment. A number of recommended works were then proposed with indicative costs given for each all recommended treatments.

The total cost of the improvements identified is approximately \$2,125,000 excluding GST, at an average of about \$425,000 per year over a 5-year program.

If implemented, the proposed works will help to improve pedestrian safety and amenity across the Manly LGA and encourage residents and employees to undertake walking trips for shopping, work, and leisure. It is recommended that these works be implemented as funding becomes available from Northern Beaches Council, and Roads and Maritime Services. Consideration could also be given to including some items, as appropriate, in Council's Section 94 contribution plan when it is updated.

## GLOSSARY OF TERMS AND ACRONYMS

**PAMP:** Pedestrian Access and Mobility Plan

**DDA:** Disability Discrimination Act

**GIS:** Geographic Information System

**DCP:** Development Control Plan

**LEP:** Local Environmental Plan

**Historical Crash Data:** The data are confined to crashes that conform to the national guidelines for reporting and classifying road vehicles crashes. The guidelines include crashes that meet all of these criteria:

- Were reported to the police
- Occurred on a road open to the public
- Involved at least one moving road vehicle
- Involved at least one person being killed or injured or at least one motor vehicle being towed away.

**PAMP Route:** Key pedestrian routes identified in the study, and prioritised and audited based on their proximity to pedestrian attractors and generators, pedestrian crash clusters, community feedback, and relation to road hierarchy.

**Pedestrian:** Any person walking including: a person driving a motorised wheelchair that cannot travel at over 10 kilometres per hour (on level ground), a person in a non-motorised wheelchair, a person pushing a motorised or non-motorised wheelchair, a person in or on a wheeled recreational device or wheeled toy. (Source: *Roads and Maritime Services How to Prepare a Pedestrian Access and Mobility Plan*)

**TGSI:** Tactile Ground Surface Indicators

## APPENDIX A

### DESIGN STANDARDS

## DESIGN STANDARDS

Below is a list of links (where applicable) to all design standards and codes referenced in the PAMP. The design standards adopted include a combination of Australian Standards, Austroads Guides and local Roads and Maritime Services technical directions and model drawings.

- Australian Standard AS 1158.4:2009: Lighting for Roads and Public Spaces
- Australian Standard AS 1428.4.1 – 2009: Design for Access and Mobility
- Australian Standard AS 1742.10: Pedestrian Control and Protection
- Austroads Guide to Road Design Part 4. Intersections and Crossings
- Austroads Guide to Road Design Part 6A, Pedestrian and Cycle Paths
- Disability Standards for Accessible Public Transport 2002  
<https://www.comlaw.gov.au/Details/F2005B01059>
- NSW Bicycle Guidelines (RTA 2005).  
[http://www.rms.nsw.gov.au/business-industry/partners-suppliers/documents/technical-manuals/nswbicyclev12aa\\_i.pdf](http://www.rms.nsw.gov.au/business-industry/partners-suppliers/documents/technical-manuals/nswbicyclev12aa_i.pdf)
- Roads and Maritime Services model drawings MD R173.B01.A1.  
<http://www.rms.nsw.gov.au/business-industry/partners-suppliers/design-documents/model-road-drawings/mrd-general-concrete-paving.html>
- Roads and Maritime Services Technical Direction TDT 2002/12b (Stopping and Parking Restrictions at Intersections and Crossings)  
[http://www.rms.nsw.gov.au/trafficinformation/downloads/td02\\_12b.pdf](http://www.rms.nsw.gov.au/trafficinformation/downloads/td02_12b.pdf)
- RUM Codes (from Definitions and notes to support road crash data, TfNSW June 2014).  
<http://roadsafety.transport.nsw.gov.au/downloads/definitions-notes.pdf>



## APPENDIX B

### TRAFFIC COUNT DATA

## APPENDIX C

### CRASH DATA SUMMARY

## APPENDIX D

### BUS FREQUENCIES

## APPENDIX E

### COMMUNITY CONSULTATION RESULTS



## APPENDIX F

### SCHEDULE OF WORKS

## APPENDIX G

### SUMMARY OF COSTS

ID	Scoring Criteria	Score
C1	Connectivity to pedestrian generator/attractor	High Priority 10 Medium Priority 5
C2	Proximity to Generators/Attractions	< 250m 10 > 250 - 500 m 8 > 500 - 1000m 5 > 1000m 0
C3	Pedestrian crash history	> 3 reported per year 20 3 reported per year 15 2 reported per year 10 1 reported per year 5 0 reported per year 0
C4	Concerns from community feedback	5 or more responses 5 less than 5 responses 2 no responses 0
C5	Relation to road hierarchy	State road 10 Arterial/sub-arterial 8 Collector road 5 Local street/Pedestrian Mall 3
C6	Land Use	School / aged care 10 Commercial / retail 8 Residential 5
C7	Pedestrian Safety	Essential 10 Desirable 5 Little impact 3
C8	Pedestrian Desire Lines	Strong desire line 5 Medium usage 3 Very little use 1

Score	Rank Priority
> 50	High
50 - 30	Medium
< 30	Low

High	69	3.28%
Medium	1779	84.47%
Low	258	12.25%
<b>Total</b>	<b>2106</b>	

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Shoreline Plant	PMR 14	Specific Ln	Prisoner Phase VI	Typ. Hazard	Unseen Pathway and Road Edge at Service Drive	Medium	Structure and level footpath, basement
Shoreline Plant	PMR 15	South of Dandenong St	Prisoner Phase VI	Typ. Hazard	Unseen Pathway at Road	Medium	Structure and level footpath, basement
Shoreline Plant	PMR 16	Specific Ln	Prisoner Phase VI	Typ. Hazard	Overgrown North of Base of Post	Medium	Structure and level footpath, basement
Shoreline Plant	PMR 17	Specific Ln	Prisoner Phase VI	Typ. Hazard	Unseen Pathway at Service Drive	Medium	Structure and level footpath, basement
Shoreline Plant	PMR 18	Specific Ln	Prisoner Phase VI	Typ. Hazard	Unseen Pathway at Service Drive	Medium	Structure and level footpath, basement
Shoreline Plant	PMR 19	Specific Ln	Prisoner Phase VI	Typ. Hazard	Unseen Pathway at Service Drive	Medium	Structure and level footpath, basement
Shoreline Plant	PMR 20	Specific Ln	Prisoner Phase VI	Typ. Hazard	Unseen Pathway at Service Drive	Medium	Structure and level footpath, basement
Shoreline Plant	PMR 21	Specific Ln	Prisoner Phase VI	Typ. Hazard	Unseen Pathway at Service Drive	Medium	Structure and level footpath, basement
Shoreline Plant	PMR 22	Specific Ln	Prisoner Phase VI	Typ. Hazard	Unseen Pathway at Service Drive	Medium	Structure and level footpath, basement
Shoreline Plant	PMR 23	Specific Ln	Prisoner Phase VI	Typ. Hazard	Unseen Pathway at Service Drive	Medium	Structure and level footpath, basement
Shoreline Plant	PMR 24	Specific Ln	Prisoner Phase VI	Typ. Hazard	Unseen Pathway at Service Drive	Medium	Structure and level footpath, basement
Shoreline Plant	PMR 25	Specific Ln	Prisoner Phase VI	Typ. Hazard	Unseen Pathway at Service Drive	Medium	Structure and level footpath, basement
Shoreline Plant	PMR 26	Specific Ln	Prisoner Phase VI	Typ. Hazard	Unseen Pathway at Service Drive	Medium	Structure and level footpath, basement
Shoreline Plant	PMR 27	Specific Ln	Prisoner Phase VI	Typ. Hazard	Unseen Pathway at Service Drive	Medium	Structure and level footpath, basement
Shoreline Plant	PMR 28	Specific Ln	Prisoner Phase VI	Typ. Hazard	Unseen Pathway at Service Drive	Medium	Structure and level footpath, basement
Shoreline Plant	PMR 29	Specific Ln	Prisoner Phase VI	Typ. Hazard	Unseen Pathway at Service Drive	Medium	Structure and level footpath, basement
Shoreline Plant	PMR 30	Specific Ln	Prisoner Phase VI	Typ. Hazard	Unseen Pathway at Service Drive	Medium	Structure and level footpath, basement
Shoreline Plant	PMR 31	Specific Ln	Prisoner Phase VI	Typ. Hazard	Unseen Pathway at Service Drive	Medium	Structure and level footpath, basement
Shoreline Plant	PMR 32	Specific Ln	Prisoner Phase VI	Typ. Hazard	Unseen Pathway at Service Drive	Medium	Structure and level footpath, basement
Shoreline Plant	PMR 33	Specific Ln	Prisoner Phase VI	Typ. Hazard	Unseen Pathway at Service Drive	Medium	Structure and level footpath, basement
Shoreline Plant	PMR 34	Specific Ln	Prisoner Phase VI	Typ. Hazard	Unseen Pathway at Service Drive	Medium	Structure and level footpath, basement

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Whisper Street	1465 70	North of Mabel St	Whisper Street A	Construction	Strip Pige Dropping Pedestrians 2	Medium	Grass path to foot clear and objects removed
Whisper Street	1465 71	North of Mabel St	Whisper Street A	Construction	Strip Pige Dropping Pedestrians	Medium	Grass path to foot clear and objects removed
Whisper Street	1465 72	North of Mabel St	Whisper Street A	Top Hazard	Missing Footpath Paving	Medium	Bricks and board paving
Whisper Street	1465 73	South of Sylvia St	Whisper Street A	Top Hazard	Missing Footpath	Medium	Bricks and board paving
Whisper Street	1465 74	South of Sylvia St	Whisper Street A	Construction	Footpath Obstruction and Bikes Locked to Pole	Medium	Investigate the installation of bike racks
Whisper Street	1465 75	South of Sylvia St	Whisper Street A	Construction	Unseal Edge of Road and Corner	Medium	Resurface and level footpath, kerbside
Whisper Street	1465 76	South of Sylvia St	Whisper Street A	Top Hazard	Lift on Services Corner	Medium	Structure and level footpath, kerbside
Whisper Street	1465 77	South of Sylvia St	Whisper Street B	Top Hazard	Overgrown Service Cover	Medium	Level service cover built with materials
Whisper Street	1465 78	South of Sylvia St	Whisper Street B	Top Hazard	Unseal Pavement Around Service Cover	Medium	Resurface and level footpath, kerbside
Whisper Street	1465 79	South of Sylvia St	Whisper St B	Top Hazard	Loading zone sign in front to see place	Medium	Replace road new signage
Whisper Street	1465 80	South of Sylvia St	Whisper Street A	Construction	Bike Racks to be replaced	Medium	Investigate the installation of bike racks
Whisper Street	1465 81	South of Sylvia St	Whisper Street A	Construction	Bike Locked to Pole, No Bike Rack	Medium	Investigate the installation of bike racks
Whisper Street	1465 82	South of Sylvia St	Whisper Street B	Construction	Bike Locked to Pole, No Bike Rack	Medium	Investigate the installation of bike racks
Whisper Street	1465 83	South of Sylvia St	Whisper Street B	Construction	Vegetation Obstruction	Medium	Trim back and/or remove vegetation
Whisper Street	1465 84	South of Sylvia St	Whisper Street B	Construction	Overhanging Tree Trunk 2	Medium	Trim back and/or remove vegetation
Whisper Street	1465 85	South of Sylvia St	Whisper Street B	Construction	Overhanging Tree Trunk 1	Medium	Trim back and/or remove vegetation
Whisper Street	1465 86	South of Sylvia St	Whisper Street B	Construction	Bike Locked to Pole Opposite Full Stop Parking Cage	Medium	Investigate the installation of bike racks
Whisper Street	1465 87	South of Sylvia St	Whisper Street B	Construction	Seal and Bikes Locked to Tree and Seal	Medium	Investigate the installation of bike racks