



Maitland Bicycle Plan and Strategy 2014

Maitland City Council

November 2014

Table of contents

1.	Introduction	1
1.1	Study background	1
1.2	Vision and strategic goals.....	1
1.3	Objectives of the study	2
1.4	Report structure	2
2.	Understanding the Local Context.....	3
2.1	Policy context.....	3
2.2	Local travel patterns	4
2.3	Bicycle safety	5
2.4	Consultation	6
2.5	Existing bicycle facilities	10
3.	Framework for Supporting Cycling in Maitland.....	12
3.1	Introduction	12
3.2	Methodology for identifying cyclist needs	15
3.3	Selecting the appropriate path type.....	17
3.4	Prioritisation methodology	21
4.	Actions to Support Cycling in Maitland.....	25
4.1	Introduction	25
4.2	Bicycle infrastructure actions	27
4.3	Bicycle parking	35
4.4	Signage.....	35
4.5	Behaviour change programs.....	36
4.6	Promotion and marketing actions.....	38
4.7	Hunter Expressway	38

5.	Delivering the Strategy	39
5.1	Maintenance	39
5.2	Monitoring	39

Table index

Table 1	Cyclist crashes (2005-2009)	5
Table 2	Cyclist crashes by Year (2005-2009)	5
Table 3	Cyclist crashes by speed zone (2005-2009).....	5
Table 4	Distribution of Respondents by Suburb	7
Table 5	Infrastructure provision goals.....	16
Table 6	Recommended On-Road Bicycle Lane Widths.....	18
Table 7	Path widths – exclusive bicycle paths	19
Table 8	Shared path widths.....	20
Table 9	Weighted criteria scoring system	24
Table 10	The behavioural model for the cycling strategy	26
Table 11	Proposed cycle improvements for Maitland.....	27
Table 12	Prioritisation of bicycle infrastructure projects	31
Table 13	Bicycle parking facilities.....	35

Figure index

Figure 1	Reason for travel	4
Figure 2	Mode of travel	4
Figure 3	Guide for determining separation of bicycles and motor vehicles.....	17
Figure 4	Selection Guide for Off-Road Path Types	18
Figure 5	Typical cross-section - one-way pair of off-road bicycle paths	19
Figure 6	Typical cross-section - two- way off -road bicycle path on one side of road	19
Figure 7	Typical cross-section for a two-way off-road shared path	19
Figure 8	Bicycle routes at small single land roundabouts	20
Figure 9	Separated bicycle routes at single land roundabout	21

Appendices

Appendix A – Bicycle network proposals

Appendix B – Crash statistics

1. Introduction

GHD Pty Ltd (GHD) was engaged by Maitland City Council to undertake the *Maitland Bike Plan and Strategy*. This report documents the outcomes of the study.

1.1 Study background

Maitland City Council is a semi-rural Council located approximately 35 km to the north-west of Newcastle and 165 km north of Sydney. The Local Government Area (LGA) is comprised of a number of townships connected by significant lengths of road. Council has a long term focus on improving active transport options, including bicycle facilities, to provide more transport choices for the community. Council seeks to update the 2005 Bike Plan. This study forms one of the first steps in providing new cycling facilities across the LGA.

The scope of this study is to provide Maitland City Council with a local-level understanding of:

- The existing cycling network across the LGA
- The key issues of concern with regard to existing cycling activities, safety and demographics

- Recommendations of behavioural change strategies to encourage an increase in cycling
- Recommendations of potential improvements to the existing cycle network infrastructure, catering for various user groups

1.2 Vision and strategic goals

1.2.1 Inclusive + connected + integrated

By 2021, cycling will no longer be considered as just a sport and recreation activity. The community will have welcomed cycling as a normal way to access goods and facilities. Cycling will have become an inclusive mode of travel, embraced by all ages, genders and abilities. The growth in cycling will have been enabled by a connected network of safe, comfortable and attractive cycleways, and associated facilities. This network connects people with key destinations, supporting local businesses and tourism. Cycling will have become an important strand of our integrated transportation system, and an important contributor to the health and wellbeing of our community.

1.2.2 Strategic goals

The vision is supported by the following strategic goals:

- Provide a bicycle network that is safe, comfortable and appropriate for the needs of all types of users.
- Provide a bicycle network that connects the community with local businesses, workplaces, schools, amenities, and tourism and heritage locations.
- Support cycling as a legitimate form of transport for both transport and sport and recreational activities, and as a legitimate user of the road.
- Promote cycling as a viable form of transport by integrating it with local events, history and tourism.
- Integrate cycling with the wider transportation system through the provision of functional and attractive end-of-trip facilities.

1.3 Objectives of the study

The objectives of the study are to review the current cyclist needs in Maitland and to provide a consistent standard of facilities for cyclists within the LGA. Through the implementation of the Bike Plan, it is hoped that cyclist activity will increase and thereby improve the amenity for all local residents and visitors to the LGA. Cycling is also important from a sustainability perspective as it is a viable alternative to the use of private cars or public transport, and are emission free forms of getting from 'A' to 'B'. With walking, cycling is the only readily available mode of transport that produces no emissions. When considered in conjunction with the low cost of walking and cycling and the health benefits, there are several positive impacts.

The specific objectives for the Bike Plan are to:

- Provide an overarching strategy for provision of bicycle facilities within the LGA.
- Increase use of bicycles within the community.
- Encourage alternative methods of transport.
- Improve community health and provide safer routes to school.
- Reduce the number of missing links and severance within the existing bicycle network.
- Reduce the number of bicycle accidents.
- Improve connectivity of the cycle network with other transport modes, primarily bus, car, train and pedestrians.
- Complement existing and planned cycleways.

This study has focused upon extending the existing network of bicycle facilities. It is assumed that Maitland City Council has existing programs for the maintenance and upgrade of existing facilities. This study therefore aims to add greatest value to Council's strategies and works programs by identifying the gaps in existing networks and extending the networks where appropriate.

1.4 Report structure

This report details background information, site observations, recommended treatments and the likely cost of such treatments. Each are dealt with in detail in various sections of the report.

- Section 2 provides a review of the existing conditions for cycling in Maitland.
- Section 3 provides the framework, which guided the development of the Strategy.
- Section 4 presents the actions to support cycling in Maitland.
- Section 5 presents the framework for delivering the Strategy, including maintenance and monitoring.

2. Understanding the local context

The following chapter presents a review of the local context, which influences the level of cycling participation in Maitland, and covers:

- Policy context
- Local travel patterns
- Bicycle safety
- Consultation
- Existing bicycle facilities

2.1 Policy context

Recreation and Open Space Strategy by Manidis Roberts (2004)

Covered a wide range of issues, which included the development of off-road multi-use trails for walking and cycling.

Maitland Bike Plan by Maitland City Council (2005)

Bicycle planning in Maitland has been undertaken since 1982; however the implementation of the cycleways has been fragmented and inconsistent. A program of works was broken into Trunk Routes, Collector Routes and Scenic Routes. A total of 12 Trunk Routes, 53 Collector Routes and five Scenic Routes were costed and prioritised.

Lower Hunter Regional Strategy 2006-2031 by NSW Department of Planning (2006)

Maitland has been identified as a Major Regional Centre. Towns are identified as Lochinvar, Rutherford, East Maitland and Thornton. Green Hills has been identified as a Standalone Shopping Centre.

Maitland Centres Strategy by Hill PDA (2009)

Assessment of economic and employment trends and demand generated within the LGA. The study forecast demand for over 12,000 additional jobs within the LGA by 2031. A centre hierarchy was presented, broadly reflective of that in the Lower Hunter Regional Strategy, including local centres.

Central Maitland Structure Plan by URAP / TTW (2009)

Sets out a vision to guide growth and development over the next 20 years. Identifies desired links across Central Maitland precincts.

Integrated Land Use and Transport Study by URAP/TTW (2009)

One of the main objectives of the study is to encourage more use of public (i.e. train and bus) and active (walk and bicycle) transport in Maitland. The study provides an overview of areas that are accessible by bikes or could be used as recreational cycle routes. In the Maitland CBD, an assessment of existing bike routes/facilities was undertaken and a number of measures and routes were identified.

NSW Bike Plan by RTA (2010)

No specific information relating to Maitland.

Activity Centres and Employment Clusters Strategy by Maitland City Council (2010)

Provides a hierarchy and network of activity centres and employment clusters based on the Maitland Centres Strategy.

Maitland Review of Open Space 2011: Issues Paper by @leisure (2011) (DRAFT)

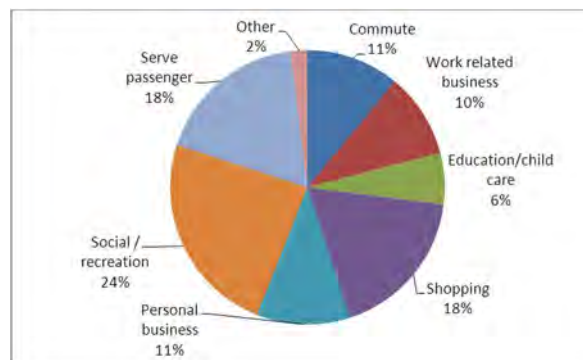
Assessment of current and future demand for open spaces. A series of off-road trails were proposed. Public access along waterways was highlighted.

2.2 Local travel patterns

Based on Bureau of Transport Statistics data, Figure 1 indicates that travel purposes across the Maitland LGA vary widely. The largest travel purpose is for a social / recreational purpose (24%), followed by shopping and 'serve passenger' (which refers to a trip made to drop off or pick up a passenger), which are both 18%. Commuting trips only comprise 10% of all trip purposes in Maitland.

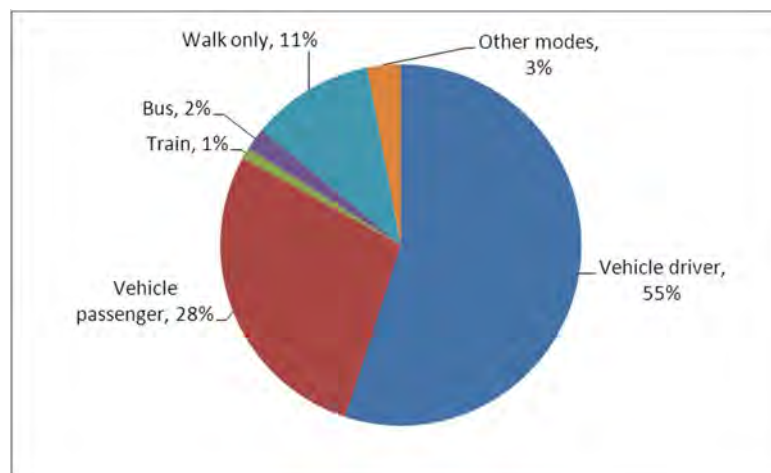
Figure 2 indicates that car based travel is predominant across the Maitland LGA. This is comprised of 55% vehicle drivers and a further 28% are vehicle passengers, indicating 83% of trips are made by car. While 11% of trips are made by walking, bus and train use is only 1-2%. Cycling trips are included under the 'Other modes', which is 3%.

Figure 1 Reason for travel



Source: BTS, Key Transport Indicators, 2007 (released 2009).

Figure 2 Mode of travel



Source: BTS, Key Transport Indicators, 2007 (released 2009).

2.3 Bicycle safety

Cyclist incident data for the Maitland area for the years 2005 to 2009 originally sourced from the RTA were obtained from Council. Summarised in Table 1 and Appendix B, the crash records indicate that there were 30 reported crashes involving cyclists over this period. Twenty-nine of these crashes resulted in injury. However, there was additionally one fatality recorded over this period.

It can be seen that the suburbs with the highest number of crashes were Rutherford with 10 crashes (including one fatality), followed by Maitland (five) and East Maitland (four).

Overall, Table 2 shows no dramatic increase or decrease in cyclist incidents over the considered time frame, with crashes ranging from 4-7 per year. The one fatality was in 2007.

Table 3 shows that half of cycle crashes were in 50 km/h zones. A further 30% of crashes occurred on roads with speed limits above 50 km/h. However, there were only three crashes in speed zones of 40 km/h, indicating that there are generally fewer cyclist crashes on roads with lower traffic speed limits.

It should additionally be noted that the crash data is based on NSW Police reports, which generally under-represents the incidence of cyclist related crashes. This is due to the fact that many minor cyclist incidents do not result in tow-away crashes where police are called and the incident therefore goes unrecorded.

Table 1 Cyclist crashes (2005-2009)

Town	Cyclist Injuries	Cyclist Fatalities	Total
Aberglasslyn	1	0	1
Ashtonfield	1	0	1
Berry Park	1	0	1
East Maitland	4	0	4
Gillieston Heights	1	0	1
Louth Park	1	0	1
Maitland	5	0	5
Metford	1	0	1
Rutherford	9	1	10
Telarah	1	0	1
Tenambit	1	0	1
Thornton	3	0	3
Total	29	1	30

Source: Maitland City Council (from RTA).

Table 2 Cyclist crashes by Year (2005-2009)

Year	Cyclist Injuries	Cyclist Fatalities	Total
2005	7	0	7
2006	4	0	4
2007	4	1	5
2008	7	0	7
2009	7	0	7
Total	29	1	30

Source: Maitland City Council (from RTA).

Table 3 Cyclist crashes by speed zone (2005-2009)

Speed Limit	Cyclist Injuries	Cyclist Fatalities	Percentage of Total
80 km/h zone	6	0	20.0%
70 km/h zone	1	0	3.3%
60 km/h zone	5	0	16.7%
50 km/h zone	14	1	50.0%
40 km/h zone	3	0	10.0%
Total	29	1	100.0%

Source: Maitland City Council (from RTA).

2.4 Consultation

The consultation process included stakeholders and community group representatives from across the LGA, as it is important to include the community in the development of a Bike Plan that seeks to address local issues. Overall, the aims of the consultation process were to:

- Assist in understanding community needs for the each town centre and the LGA as a whole;
- Provide information about the project process to the community; and
- Involve the community in the planning process to increase the sense of ownership of the project outcomes.

2.4.1 Steering group workshop

A workshop was held with Council's Steering Group on 14th November 2011. Firstly this workshop sought to identify a vision for the strategy and identify strategic goals for the Bike Plan and Strategy. An outline of these is provided below.

The workshop also sought to identify key missing 'links' or 'gaps' in the bicycle network (indicating if there were on-road or off-road gaps), and discussed the top priorities of these missing links. These outputs were incorporated into the development of the proposed bicycle routes.

2.4.2 Community consultation

The following section presents the key findings from the *Maitland City Council Bike Plan Consultation* survey completed by residents of the City of Maitland. The questions are as follows (on the basis of survey results provided by Maitland City Council).

The survey was advertised in a newspaper article (2nd December 2011) encouraging interested parties to visit Council or be in the Maitland Heritage Mall on two dates to complete a survey on paper. The same article also encouraged interested people to visit the maitlandyoursay.com website where the online version of the survey was located. The online version was also advertised on Council's Facebook page and the Maitland 2021 Facebook page.

The online and paper based survey was made available to respondents between 11/11/2011 and 12/12/2011.

This report uses "n=" to denote the number of respondents who selected a certain response and percentages to describe the response as a proportion of all responses to the question.

The respondents

- 42 people responded to the survey, with 41 completing a sufficient proportion for analysis
- 44% (n=18) were female
- 56% (n=23) were male
- 90% (n=37) of respondents provided their suburb of residence - the distribution of respondents by suburb of residence is presented in Table 4.

Survey representativeness

The distribution of survey respondents by gender and age were compared with the distribution of Maitland residents by gender and age (based on 2006 Census Data). It is noted that the small sample size of this survey is not sufficient to provide representative results (regardless of gender or age distribution). As such, cross analysis of responses has been limited to avoid misrepresenting sub-groups (e.g. different cyclist types) within this survey and percentages have not been quoted for any analysis of responses by sub groups.

There was a slight overrepresentation of males and corresponding underrepresentation of females within the survey sample:

- 56% (n=23) of respondents were male compared to 49% (n=30,250) residents
- 44% (n=18) of respondents were female compared to 51% (n=31,630) residents

The age distribution of respondents could not be accurately compared against that of all residents because the survey adopted different age groups to those adopted by the ABS Census.

The results suggest that those aged between 25 and 54 are likely to be overrepresented in this survey sample and other age groups underrepresented. The survey results provide a summary of key barriers and enablers to cycling; however, their comparative importance is unlikely to reflect their importance amongst all City of Maitland residents.

Maitland cyclists

Survey respondents were asked to describe themselves as regular, infrequent or non-cyclists. It is noted that the definitions for each of these were not provided to respondents.

Respondents by cyclist type:

- 29% (n=12) reported they were regular cyclists
- 34% (n=14) reported that they were infrequent cyclists
- 27% (n=11) reported that they were non-cyclists

Table 4 Distribution of Respondents by Suburb

Suburb of Residence	Number of Respondents	% of Respondents
East Maitland	8	20%
Ashtonfield	5	12%
Not from Maitland	4	10%
Maitland	4	10%
Tenambit	2	5%
Bolwarra Heights	2	5%
Metford	2	5%
Aberglasslyn	1	2%
Bolwarra	1	2%
Farley	1	2%
Largs	1	2%
Maitland Central	1	2%
Rutherford	1	2%
Telarah	1	2%
Thornton	1	2%
Windella	1	2%
Woodberry	1	2%
No response	4	10%
TOTAL	37	100%

Trip purposes

In addition, survey respondents were asked about the purpose of their trips.

- 54% (n=22) said they ride for leisure and touring
- 19% (n=8) said they ride for sport (e.g. road racing, mountain biking)
- 5% (n=2) said they ride for transport (presumably for commuting to work)

There were some differences in trip purpose amongst different cyclist types:

- A significant majority of infrequent cyclists ride for leisure and touring reasons only
- Regular cyclists are more likely to also ride for sporting purposes
- A small proportion of non-cyclists also reported that they ride for leisure and touring purposes

Motivations for cycling

Respondents were asked to indicate what their motivations were for cycling.

- 12% (n=6) did not answer the question

The key reasons why survey respondents cycle are:

- 42% (n=22) for their health, fitness and to exercise
- 15% (n=8) to spend time with family, friends or to accompany children or other riders
- 12% (n=6) for fun and enjoyment

"The thing that would motivate me to ride would be getting out with my family and friends for fun and exercise"

Respondent

Other motivations include:

- 6% (n=3) because they enjoy the outdoors
- 6% (n=3) because there are accessible paths and infrastructure available for them to use
- One respondent also suggested that "a place to go" and "good views" along the way motivated them to ride

"The combination of fitness and the ability to get outside and ride in the quiet open roads behind Maitland is highly invigorating and motivational to me."
Regular cyclist

Respondent

There were no clear differences between regular, infrequent and non-cyclists.

Barriers to cycling

Cyclists and non-cyclists were asked to indicate the barriers to cycling more often. Respondents reported a range of barriers. While there were no clear barriers that were significantly more important than others, the more common barriers to cycling in Maitland are as follows:

- 15% (n=11) riding amongst traffic
- 14% (n=10) lack of routes that are safe and adequately separated from road traffic

These barriers were often compounded by the following issues:

- 8% (n=6) said they didn't have enough time to ride
- 7% (n=5) said there was a lack of cycling infrastructure
- 6% (n=4) said that existing infrastructure was poorly maintained

- 3% (n=2) said they had a lack of confidence in their cycling skills
- One cyclist also noted that shared bicycle and parking lanes were a concern, "particularly near schools"

"I have very young children who are only just learning to ride so I would prefer cycleways to be away from roads. My own lack of confidence with riding also makes me prefer separate riding zones."

Respondent

There were no clear differences in the key barriers for regular, infrequent and non-cyclists.

Other barriers cited by only one cyclist (per response) are detailed below.

- Not being able to ride a bicycle
- Age (a non-cyclist over the age of 60)
- Topography in their local area (East Maitland)
- Lack of infrastructure in their local area (Tenambit)
- Lack of paths that lead to desired destinations

“Current paths (e.g. riverbank) don't go anywhere, or lead you back on to a main road.”

Respondent

- A lack of safe places to cross the highway
- Abuse by motorists
- Previous near misses with impatient motorists
- A lack of bicycle racks at trip destinations

“I have been abused by motorists and /or had near misses with impatient motorists whilst trying to position myself to a safer position on the road. I have found in these areas cyclists rights on the road are often completely disregarded.”

Respondent

Enablers for cycling

Respondents were asked to indicate what changes would encourage or support them to ride more often.

As noted previously, only responses from 24 respondents were made available for analysis.

The enablers suggested by respondents are as follows (percentages have not been quoted to avoid misrepresenting proportions based on this very small sample of responses):

- Off-road or separated bike paths and are “away from the main road” (n=6)
- Greater separation from traffic for on road cycle lanes (n=5)
- More bicycle infrastructure (n=4)
- More time (generally leisure time) to ride (n=3)
- Scenic and pleasant bike trails that are “flat”, “less noisy” and run through “parks and reserves” (n=3)
- Information on available routes (n=1)
- Road safety education (n=1) – it is unclear whether this was related to educating cyclists, cyclists skills training or educating motorists

“I would love to see extensive designated bike paths to promote a healthy lifestyle, particularly for children.”

Respondent

Gaps in the network

Respondents were asked to identify gaps in the network. Their responses can be summarised as follows:

- Bike access / lane in mall.
- Morpeth to Walka Water Works pathway.
- Path to the industrial area in Thornton.
- East Maitland to Morpeth (n=2) via old train line.
- East Maitland to Thornton.
- East Maitland to Maitland (n=2) via riverbank.
- Maitland to Telarah.
- Network in / to:
 - Inner Maitland.
 - Woodberry.
 - Morpeth.
- Improvements in Phoenix Park.
- Bolwarra Heights to old Bolwarra.
- Bolwarra to Oakhampton (River Crossing).

- Improve stretch of road on Tenambit.
- New England Highway:
 - General (n=3).
 - Priority for cyclists at right turn at traffic lights, by crossing two lanes and a turning left from the left shoulder of the New England Highway (n=1).
 - Effective crossing of New England Highway from Regiment RD to Denton Park Drive Rutherford (n=1).

General improvements:

- Navigating major roundabouts.
- Sections where shoulder narrows down to merge into a lane which under heavy traffic conditions *“forces you sometimes onto the footpath for safety and be difficult to cross without use of the pedestrian crossing”*.
- Improve facilities near high traffic volume shopping centres.

2.5 Exhibition of Plan

This plan was exhibited by Council in July and August 2014 and comments from the community have been incorporated into the plan, including the addition of some projects.

2.6 Existing bicycle facilities

An audit of existing cycle conditions in towns across the LGA was undertaken for the study. The audit focused on identifying existing facilities, land uses, any shortcomings relating to cycling facilities and potential safety issues. The audit was undertaken at three levels and they are as follows:

- Based on the provision of available data relating to the existing situation, a drive through of the study area was carried out to ascertain the extent of the built bicycle network and the general traffic environment and conditions;
- Walkover assessment in key locations of high activity within the study area to understand conditions for cyclists “on the ground”; and
- A walkover of critical locations to log deficiencies with existing cycle facilities.

There are a variety of bicycle facilities across the LGA in varying conditions. The following section provides a short overview of different types of facilities.

2.6.1 Shared paths/off road

A shared path along the Hunter River provides a scenic route for cyclists away from busy roads.

Shared path in Maitland along Hunter River



Shared path in Maitland along Hunter River



2.6.2 On road facilities

There are several types of on-road bicycle facilities. These facilities range from routes with only bicycle logos on the streets, to cycle lanes marked on the road shoulders, and also includes a bi-directional separated cycleway between Bolwarra and Lorn.

Existing bicycle logo on Carrington Street, Maitland



On road cycleway on Flat Road, Bolwarra



Separated Cycleway on Belmore Road, Lorn



2.6.3 End of trip facilities

The quality of end of trip facilities (primarily bicycle parking) was also found to be variable. A poor example is provided at Maitland Railway Station, which does not provide sufficient space or area for bicycles to be properly secured.

Bicycle parking, Maitland Railway Station



3. Framework for supporting cycling in Maitland

3.1 Introduction

This section presents the approach taken and factors considered in developing the Bike Plan.

3.1.1 Creating a safe and attractive environment for cycling

Cycling is a highly efficient, environmentally benign form of transport. As with walking, cyclists are improving their health and contributing to an active environment at a human scale.

Cyclists move around the public domain in various ways, largely depending on the trip purpose and rider characteristics. For example, children will tend to use the footpath and cycle at low speeds, while an adult on the way to work will ride along the fastest and most direct route available (on- or off-road).

Cyclists therefore move through an “environment” in a similar way to pedestrians, although the speed and distance which they travel mean that they identify more with the concept of a network. Attention to cycling facilities should not be confined to one or two “routes” or “links” in an area, as trip origins and destinations are diverse. Every street must be a safe route for cyclists and be

designed in accordance with the function, traffic volume and width of the street.

Infrastructure for cycling can be designed in a similar way to other vehicles, through consideration of speed, sight distance, priority at intersections etc. However, bicycles have a degree of manoeuvrability that makes them somewhat unpredictable to motorists and pedestrians. Therefore, the design of both on- and off-road facilities should aim to encourage predictability and clear priority at all conflict points.

Cyclist needs

As for pedestrians, the provision of cyclist infrastructure should not only aim to fulfil the requirements of existing users, but to increase the number of cycling trips in the area. Such an outcome would likely result in fewer car trips (particularly for shorter travel distances), healthier residents and a more active (and safe) streetscape. A number of elements are required in order to provide a high quality cycling environment. These include:

Coherence

Coherence refers to the extent of coverage and completeness of the bicycle facilities. Within built-up areas, coherence can be characterised by the completeness of the network. Outside built-up areas, it is characterised by the completeness of connecting routes.

Coherence also can refer to how the bicycle routes and network matches with the need to travel, offering a consistent quality across individual paths, continuity of paths and routes, and the ability to provide users with freedom of route choice.

Safety

Cyclists are particularly vulnerable road users. They are slower and smaller than the dominant vehicles in traffic, making them less likely to be seen. Furthermore, cyclists have little protection at times of collisions. When approaching an intersection, cyclists are rarely in a position that motorists expect. Cyclists are positioned close to cars and are not often in view of drivers. This can lead to conflict. Intersections present a danger for cyclists due to the many movements from different directions. Clear guidance is needed on the approach, through and exit from the

intersection for both cyclists and motorised traffic. Off-road paths reduce the risk of collision with vehicles, but still endanger cyclists at intersections with roads. Also, cyclists can collide with pedestrians with potentially fatal outcomes. The general principles of predictability and clear priority remain important for off-road paths, including directional segregation and high visibility for all users.

Personal security for cyclists is perhaps less critical than for pedestrians. However, narrow and dark areas remain dangerous for cyclists and should be avoided.

Directness

As for pedestrians, cyclists dislike significant deviations to their route. However, some flexibility can be expected where a better cycling environment is provided on a minor deviation from the most direct route. A careful balance must be found between providing a direct route and also one free of delays or safety concerns.

Amenity

People will more be likely to cycle in a pleasant environment. The route should be scenic, quiet, and free of heavy traffic and traffic travelling at high speeds. The best cycling environment is often found in areas that have been traffic calmed.

Suitable for all users

Cyclists cover a large range of user skill levels and trip purposes. While skill level often depends on age, other factors such as frequency of cycling and carrying heavy loads can affect a user's actions. Trip purposes often dictate the preferred cycling facility. Best practice aims to provide for all users on a particular cycle route, ensuring that no users are excluded from using the facility. If one type of bicycle facility is unable to provide for all users of that route, a duplicate (both on and off-road facilities) facility should be provided.

End of trip facilities

As noted above, bicycle users need to know that their bike is safe from theft while it is not attended. This can be achieved through the provision of bike racks and lockers in areas that are well lit, in view of the public and protected from the weather. Where possible, Council should also encourage the provision of shower and change rooms in new buildings such as offices through planning controls.

3.1.2 Cycling strategies

Council should support and encourage cycling through the following actions:

- Actively promote cycling through the provision of quality cycling facilities and the establishment of an attractive and amenable cycling environment.

- Build a network of primary cycle routes within major towns in the LGA. These should serve key local and regional cycling demand and provide direct and convenient links between commuting, social and recreational destinations.
- Bicycle access to this network should be promoted through the establishment of an ambient traffic environment that makes local roads bicycle-friendly.
- Provide secure parking and 'end-of-trip' facilities for cyclists.
- Utilise traffic calming and reduction of speed limits (to 40-50 km/h) where necessary to lower the speed environment on local roads.
- Develop policies, guidelines, training and assessment measures to ensure that the needs of cyclists are considered when planning and designing traffic facilities and other elements of the urban environment.

3.1.3 User types

Cycling attracts a large variety of participants, many of which have very different motivations for participating. It is particularly important to recognise the needs of each user type to ensure facilities cater and encourage use of current, new and proposed routes.

Many non-cyclists lack the self-efficacy to cycle, even if they are willing to try it. There is a substantial body of evidence which reveals that there is also a difference in what non-cyclist and cyclists consider as the necessary “enablers” for cyclists, particularly for where infrastructure is concerned. For example, non-cyclists place more importance on segregated bicycle lanes, whereas regular cyclists, particularly males, are more willing to share the road with motorists (even if motorists do not share the same view).

Recreational cyclists

Recreational cyclists ride mainly for leisure and place a high value on enjoying the experience. They are usually less constrained by time and vary widely in skill and experience.

Popular recreation cycling destinations include routes along rivers, natural corridors and reserves, as well as attractive routes with low traffic volume and speed.

Recreational cyclists prefer:

- Comfort.
- Good surfaces.
- Minimal gradients.
- A high degree of safety and personal security.
- Routes that are pleasant, attractive and interesting.

- Circuitous routes with multiple route options.
- Screening from weather and wind.
- Parking facilities where they dismount to use facilities or visit attractions along the journey.

Commuter cyclists

Commuter cyclists ride mainly for as a mode of transport for journeys to and from a workplace, school or university. They prefer the fastest safe route between their origin and destination and are generally more skilled and experienced.

Commuter cyclists prefer:

- Directness;
- Minimal delays;
- Good surfaces;
- All-weather routes;
- Well lit routes for after-hours journeys; and
- Parking facilities and end of trip facilities at their destination.

Sport cyclists

Sport cyclists ride mainly for fitness and leisure, but like recreational cyclists also place a value on enjoying the experience. They are also less constrained by time and have a high skill and experience. Sport

cycling destinations include off-road mountain bike trails in addition to areas which provide continuous on or off-road routes.

Sport cyclists prefer:

- Comfort;
- Good surfaces or off-road trails;
- Minimal conflict with other road users;
- A reasonable degree of safety and personal security;
- Routes that are pleasant, attractive and interesting; and
- Circuitous routes.

Local trip cyclists

Local trip cyclists ride mainly as a mode of transport for running errands. They may be constrained by time and vary widely in skill and experience. Popular local trip cycling destinations include shops, shopping and town centres.

Local trip cyclists prefer:

- Comfort;
- Good surfaces;
- Minimal gradients;
- A high degree of safety and personal security; and
- Parking facilities at their destination.

3.2 Methodology for identifying cyclist needs

3.2.1 Identification of activity generators and primary routes

The following approach was adopted in developing a hierarchy of cyclist needs.

Primary activity zone

This is typically the main commercial street in the town centre. Throughout the day, pedestrians and cyclists are attracted to this zone from surrounding residential areas. It is therefore an important trip attractor. Also, there are high levels of activity occurring within this zone, making it an important area for short trips. The provision of bicycle parking should also be considered in primary activity zones.

Secondary activity generators

These include shops, schools, sporting facilities, clubs, hospitals and community facilities such as churches that are not located within the Primary Activity Zone. These land uses will attract people, but possibly only at certain times of the day or week.

Tertiary activity generators

These include the above land uses from the Secondary Activity Generators, but differentiate them based on a lower level of activity. Again, these are not located within the Primary Pedestrian Activity Zone.

Primary cyclist routes

These are routes from residential areas to the Primary, Secondary and Tertiary Activity Zones and Generators. They are trunk or collector level routes, which do not reach every property but instead form a network of routes that are accessible to a significant catchment of population. These routes take account the existing street network and topographical constraints, aiming to provide a direct and convenient route to the major trip generators. The demographic use of connecting generators is considered when defining the routes (i.e. schools and playing fields, aged care facilities and return service league clubs).

3.2.2 Identification of infrastructure provision goals

The hierarchy above provides a basis for applying standard treatments in each area or town, ensuring the development of a comprehensive and structured cycle network. Specific treatments may be required in some of these areas to accommodate the user needs or where other community suggestions are made.

These treatments form the basis of the proposed improvements. While this standard may not be achievable in the short-term due to the capital investment required, it is nevertheless a useful guide to work towards.

Desirable scenarios for potential infrastructure responses are outlined in Table 5 overleaf.

Table 5 Infrastructure provision goals

Hierarchy Feature	Desirable Route Infrastructure	Minimum Route Infrastructure
Primary Activity Zone	On-street cycle lane (min 1.5m width) in both directions in traffic calmed environment. Bike parking provided throughout the Primary Activity Zone.	Cyclists integrated into general traffic lanes in a traffic calmed environment.
Secondary Activity Generators	Low speed cyclists to share 2-2.5m path with pedestrians adjacent to the Activity Generators, to be marked as two way with a centreline. Higher speed cyclists to use cycle lanes or share general traffic lanes. Cycle parking provided near the entrance of the Activity Generators.	Cyclists integrated into general traffic lane.
Tertiary Activity Generators	Cyclists integrated into general traffic lane.	Cyclists integrated into general traffic lane.
Primary Cyclist Routes	Low speed cyclists to share 2-2.5m path with pedestrians (to be marked as two-way with a centreline). Higher speed cyclists to use on-street cycle lanes (min 1.5m width).	Cyclists integrated into general traffic lane.

3.2.3 Aims in the development of infrastructure recommendations

Major aims of the proposed improvement works, in decreasing order of priority, are:

- Fill any shortcomings in the Primary Activity Zone areas of each town through new cycle paths and footpaths;
- Establish a network of key cycle routes in the town centres and between major trip generators, including schools;
- Broaden the extent of the network to areas outside of the Primary Activity Zones; and
- Provide additional cycle routes for primarily recreational or tourism purposes.

3.3 Selecting the appropriate path type

3.3.1 Types of cycle paths

A number of path types have been described in various technical guidelines to assist decision-makers in selecting the appropriate treatment to suit local conditions. Bicycle paths can either be on-road, which are essentially “bicycle lanes” alongside motor vehicle traffic on a roadway within the road corridor, or off-road paths, which are separated from the road corridor.

The selection of the appropriate path type treatment depends on a combination of factors, which may include the level of demand for the cycle path, the conditions present in the surrounding environment, the availability of space in which to provide the path, and whether path usage is for exclusive cycle use or shared use with pedestrians.

3.3.2 Separation treatment

A key concern in the design of bicycle facilities following the alignment of roads is whether warrants exist for providing bicycle paths separated from vehicular traffic, or whether a mix of bicycle and vehicular traffic may be acceptable.

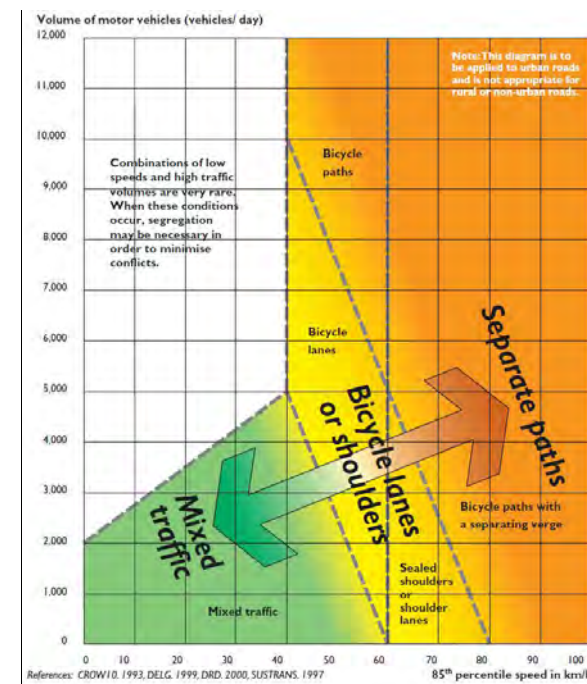
The *NSW Bicycle Guidelines*¹ provide for conditions when a separated cycle facility may be required, or when cycles operating in mixed traffic conditions may be acceptable. These are based on bicycle research in the Netherlands and other studies.

The traffic separation treatment will depend on the volume of vehicles on the road, and the vehicle speed environment.

Figure 3 provides a general guide in determining traffic separation treatment. In essence, separated paths are needed when the vehicle speed environment is 80 km/hour or faster, or when vehicle volumes are high

enough even at lower vehicle speeds (e.g. 10,000 vehicles per day, even at 40 km/hour, will require separated facilities).

Figure 3 Guide for determining separation of bicycles and motor vehicles



Source: *NSW Bicycle Guidelines, Roads and Traffic Authority* (2005).

¹ *NSW Bicycle Guidelines*, Roads and Traffic Authority (2005)

3.3.3 On-road path types

A number of different path treatments can be applied for on-road cycle facilities. These are presented and discussed in the *NSW Bicycle Guidelines* (RTA, 2005). The different on-road path types may provide physical or visual separation from the adjacent roadway, or allow for mixed bicycle-motor vehicle traffic.

In this context, on-road bicycle paths would typically be provided with some form of physical or visual separation from the

Overall, the following widths are recommended:

- 3.0 metres is the absolute maximum width and is desirable where the motor traffic is moving at high speeds (100 km/h);
- At least 2.0 metres is desirable where the motor traffic is moving at high speeds (100 km/h) or where speeds are moderate (80 km/h);
- 1.5 metres is the desirable width to be used in 60 km/h speed zones; and
- 1.2 metres is the absolute minimum width to be used along the length of the lane and should only be used where the provision of a wider lane is impractical.

Table 6 Recommended On-Road Bicycle Lane Widths

	Lane Width (m)		
Road Speed	60 km/h	80 km/h	100 km/h
Desirable	1.5 m	2.0 m	2.5 m
Accepted Range	1.2 – 2.5 m	1.8 – 2.7 m	2.0 – 3.0 m

Source: *Guide to Traffic Engineering Practice, Part 14 – Bicycles* (AUSTROADS, 1999).

A 1.0m width may also be acceptable where the speed environment is less than 60 km/h and space is severely restricted.

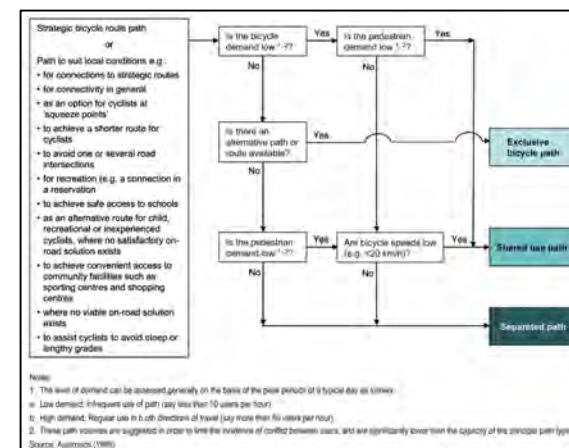
3.3.4 Off-road cycle paths

Off-road cycle paths are typically physically separated from adjacent parking or traffic lanes. Off-road paths can be of three basic types:

- Exclusively for bicycle use;
- Shared cyclist and pedestrian use; and
- Separate paths provided for cyclists and for pedestrians.

The *Guide to Road Design Part 6A: Pedestrian and Cyclist Paths* (AUSTROADS 2009) present a guide on selecting the treatment type for off-road paths. This is shown in Figure 4.

Figure 4 Selection Guide for Off-Road Path Types



Source: Figure 2.1, *Guide to Road Design Part 6A: Pedestrian and Cyclist Path* (AUSTROADS 2009).

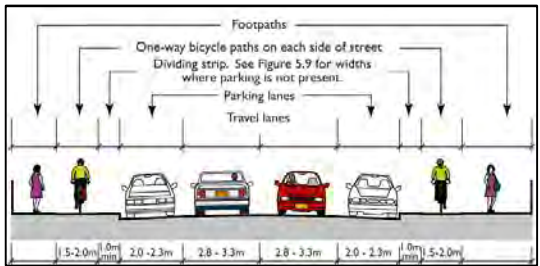
3.3.5 Exclusive cycle paths

According to the AUSTROADS Guide, exclusive bicycle paths are most appropriate under the following conditions:

- There is a significant cycling demand and very few pedestrians desire to use the path or a separate footpath is provided;
- There is very limited motor vehicle access across the path; or
- It is possible to achieve an alignment that generally allows cyclists uninterrupted and safe travel at a relatively high constant speed (say 30 km/h).

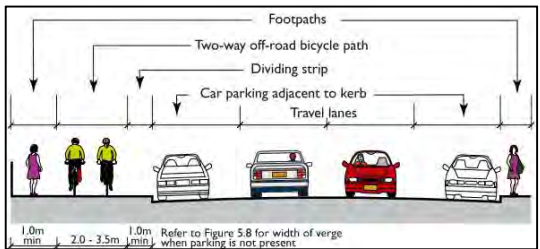
Figure 5 presents a typical road cross section for a one-way pair of off-road cycle paths, while Figure 6 shows the same for a two-way off-road exclusive cycle path on one side of the road. For local conditions where kerbside parking is not present, the dividing strip or separating verge would not be required.

Figure 5 Typical cross-section - one-way pair of off-road bicycle paths



Source: NSW Bicycle Guidelines, RTA 2005.

Figure 6 Typical cross-section - two-way off-road bicycle path on one side of road



Source: NSW Bicycle Guidelines, RTA 2005.

The AUSTROADS Guide also prescribes the design widths for exclusive cycle paths. These are shown in Table 7.

Table 7 Path widths – exclusive bicycle paths

	Path Width	
	Local Access Path	Major Path
Desirable Minimum Width	2.5 m	3.0 m
Minimum width – typical maximum	2.5 – 3.0 m ^a	2.5 – 4.0 m ^b

Source: Guide to Road Design Part 6A: Pedestrian and Cyclist Path (AUSTROADS, 2009).

a: A lesser width should only be adopted where cyclist volumes and operations speeds will remain low.

b: A greater width may be required where the number of cyclists are very high.

3.3.6 Shared use paths

Shared use paths, or shared paths, are a type of off-road facility that allows common use of the facility by both cyclists and pedestrians.

According to the AUSTROADS Guide, a shared use path may be appropriate where:

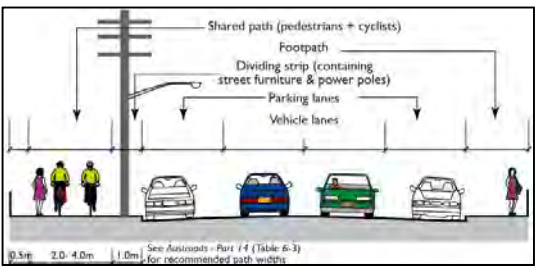
- Demand exists for both a pedestrian path and a bicycle path but where the intensity of use is not expected to be

sufficiently great to provide separate facilities;

- An existing low-use footpath can be modified to provide for cyclists by satisfying legal requirements and as necessary upgrading the surface, width and kerb ramps; or
- There is an existing road nearby which caters well for faster cyclists (e.g. has on-road bicycle lanes), to limit the extent of user conflict on the shared path.

A typical cross section of a shared path (two-way) is shown in Figure 7.

Figure 7 Typical cross-section for a two-way off-road shared path



Source: NSW Bicycle Guidelines, RTA 2005.

Table 8 provides an indication of widths for shared paths.

Table 8 Shared path widths

	Path Width		
	Local Access Path	Commuter Path	Recreational Path
Desirable Minimum Width	2.5 m	3.0	3.5
Minimum width – typical maximum	2.5a – 3.0 mb	2.5a – 4.0 mb	3.0a – 4.0 mb

Source: *Guide to Road Design Part 6A: Pedestrian and Cyclist Path* (AUSTROADS, 2009).

- a: A lesser width should only be adopted where cyclist volumes and operations speeds will remain low.
- b: A greater width may be required where the number of cyclists and pedestrians are very high or there is a high probability of conflict between users.

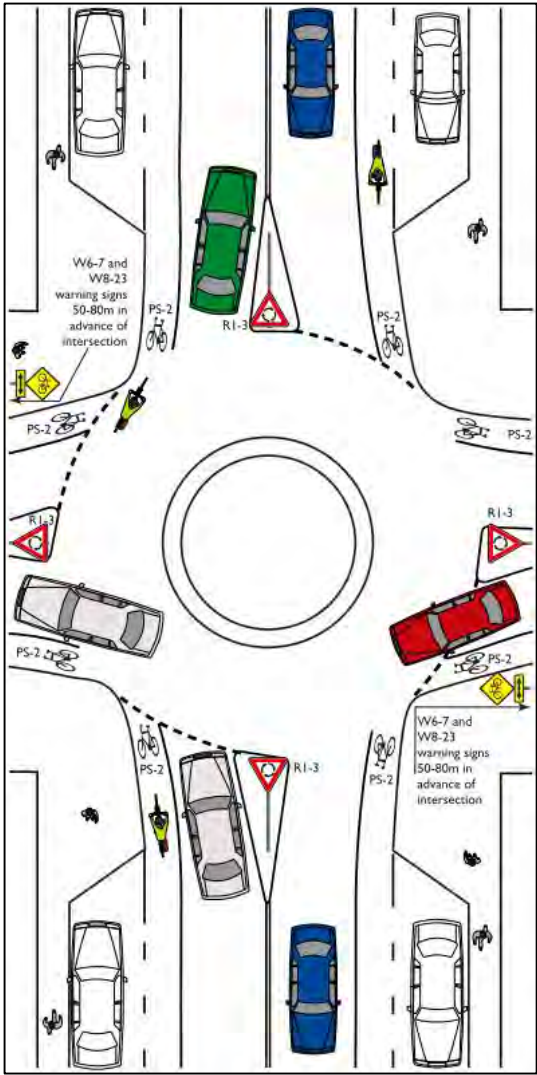
3.3.7 Separate paths

Where there are significant volumes of both pedestrians and cyclists, separate paths for each may need to be provided to minimise conflict issues associated with shared use of paths. Typically, separate paths would require a minimum of 3.0 metres on each side of the road for one-way paths, and 4.5-metre wide off-road paths for separated two-way paths, although the *AUSTROADS Guide to Road Design Part 6A: Pedestrian and Cyclist Paths* notes that such separated paths are rarely provided.

3.3.8 Intersections

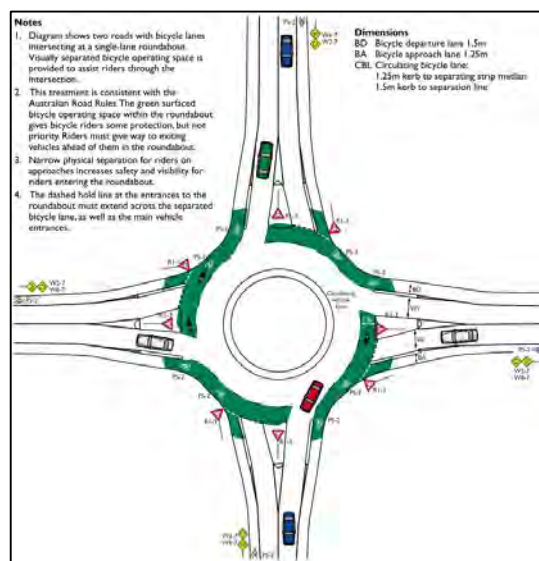
Cyclists often have safety concerns at intersections, primarily at roundabouts. Figure 8 illustrates the treatment of bicycle facilities at a small single lane roundabout. In this situation, bicycle traffic has to use the roundabout as would any road vehicle. For this reason, this treatment is not recommended where traffic speeds or volumes are high.

Figure 8 Bicycle routes at small single land roundabouts



Source: *NSW Bicycle Guidelines*, RTA 2005.

Figure 9 Separated bicycle routes at single land roundabout



Source: NSW Bicycle Guidelines, RTA 2005.

If traffic volumes are high, it is recommended that bicycle lanes be protected by a narrow median on the approaches, as shown in Figure 9. For additional comfort and safety, painted bicycle lanes can be marked around the outside edge of the roundabout. It should be noted that while this circulatory lane offers no additional priority within the roundabout, it allocates a highly visible operating space for cyclists.

3.3.9 Future indicative links

In the context of coherence, regional connections between towns also comprise part of the strategic cycle network. These will be typically on-road bicycle lanes along the shoulders of existing road corridors. As such, the design for these potential future connections may follow the design for on-road bicycle paths on-road shoulders.

Dependent on future road and traffic conditions, and other associated factors such as new developments, it may also be possible for these connections to be either off-road or shared paths. Cycling facility requirements should be considered when any of these nominated roads are being upgraded in the future.

3.4 Prioritisation methodology

3.4.1 Bike plan prioritisation and methodology

The RTA guidelines from *How to Prepare a Bike Plan* (2002) indicate that future bicycle routes should be based on a set of priorities, including:

- Safety.
- Community needs and expectations.
- Council commitment.

- Available funding and future planning opportunities.
- Rectification/maintenance programs.

Overall, this set of priorities is considered to be rather general in nature and does not provide specific guidance on prioritising one route above another. However, specific guidance does exist from the related RTA publication *How to Prepare a Pedestrian Access and Mobility Plan* (PAMP) (2002), which can be adopted to suit a prioritisation methodology for bicycle routes.

3.4.2 PAMP prioritisation and methodology

As most of the general priorities from the *How to Prepare a Bike Plan* (RTA, 2002) publication are covered in the PAMP guidelines, *How to Prepare a Pedestrian Access and Mobility Plan* (RTA, 2002), GHD has adapted the PAMP Weighted Criteria Scoring System with slight modifications to enable them to be applied in prioritising the proposed cycling improvements.

Scores were derived for each of the recommended improvements for the purpose of prioritising works both within and across different towns in the LGA. It should be noted that the prioritisation of works presented in this plan is intended to support decision making, not replace decision making.

Prioritisation of the proposed routes, based on a slight modification to the Weighted Criteria Scoring System, is covered in Section 3.4.4 and shown in Table 9.

3.4.3 Reference system

The recommendations are intended to guide the development of new cycling facilities for the existing towns but they are also intended to fit within the wider context of Council's aims, objectives and planning for anticipated future developments.

The recommended works conform to a referencing system as follows:

- Categorisation numbers for works within each town are preceded with the town name (i.e. *Maitland 1*, *Maitland 2*, etc. for works in Maitland).
- The various routes proposed in each town are classified by numbers (but are arranged in no particular order).
- The proposed routes are prioritised later in this section.

It is noted the Council may wish to alter the priority of some works depending on the timing and construction of future developments.

3.4.4 Strategic cost estimate assumptions

The strategic cost estimates are at a level of detail sufficient to inform and guide Council in securing appropriate funds to take the proposed routes forward to a more detailed level. The strategic cost estimates have been based on guidance from Council in relation to indicative unit rates, and would be subject to further refinement at a later stage.

The following assumptions were made as part of the strategic cost estimation process:

- No allowance has been made for any property acquisition.
- No allowance for contingencies are included.
- No allowance has been made for any kerbing works as part of the estimates. It has been assumed that where kerbing is required, the works will be undertaken prior to (or in tandem with) footpath works.
- No allowance has been made for implementation of wearing course across partially sealed carriageways where pedestrian crossings are proposed. It has been assumed that where bitumen is required, the works will be undertaken prior to (or in tandem with) footpath and drop kerb works.
- No allowance has been made for labour costs.
- Cycleway lengths have been measured from GIS information provided by Council and as such their accuracy is dependent on the accuracy of the GIS information provided.
- Where parking is currently permitted across existing and/or proposed pram ramps (or drop kerbs) and crossing points, it has been assumed the signage will be adjusted to ensure these areas are no standing zones. However, there has been no allowance for these works in the estimates.
- No allowance for tactile paving has been included.
- No allowance has been made for pathway lighting.
- Shared paths have been costed as being constructed with concrete, where appropriate.

- On-road cycle path costs have been costed based upon line markings on-road shoulders. The costs do not include any allowance for construction of new shoulders for cycle paths. Many shoulders and streets are very rough and not necessarily suitable for cycles. There may be opportunities to profile and seal a specific narrow section before line marking a cycle path. The costs associated with these works, however, were excluded from the strategic cost estimates.

For comparison purposes, a low-end and a high-end unit cost have been developed and used in the strategic cost estimates. These reflect relative construction difficulties for different cycle facility types. For example, for on-road pathways, the low-end cost principally incorporates line-marking, pavement symbols and signage, while the high-end cost allows for additional pavement on the road shoulders.

The guidelines define the overall work prioritisation as:

- High (100 – 70)
- Medium (<70 – 40)
- Low (<40)

Scores were derived for each of the proposed routes for the purpose of prioritising works across the Maitland City Council LGA based upon the criteria in Table 9 overleaf. It should be noted that where the proposed routes were in parallel to state roads, rather than actually on state roads, they were assigned the maximum score as the alternative, parallel routes would providing a safer and more comfortable experience for cyclists away from the main road.

Additionally, it should be noted that the prioritisation of routes/works presented in this plan are intended to support decision making, not replace decision making.

Table 9 Weighted criteria scoring system

Category	Criteria	Score
Land Use [maximum of 35]	Number of Attractors / Generators	More than 5 locations [10] 3-5 locations [8] 1-2 locations [5] 0 locations [0]
	Land Use Type	Schools [10] Commercial / retail [8] Residential [5] Other [0]
	Proximity to Attractors / Generators	Less than 250 metres [10] >250-500 metres [8] >500-1000 metres [5] >1000 metres [0]
	Future Development with Attractors / Generators	High [5] Medium [3] Low [1]
Traffic Impact [maximum of 15]	Road Hierarchy	State Road [15] Regional Road [10] Local Road [8] Special use [5] Other [0]
Safety [maximum of 25]	Identified as Hazardous Area (from Audit and Consultation)	High [10] Medium [8] Low [5] None [0]
	Identified Cyclist Crashes	>3 reported crashes per year [15] 3 reported crashes per year [10] 2 reported crashes per year [8] 1 reported crash per year [5] 0 reported crashes per year [0]
Facility Benefits [maximum of 10]	Demonstrated Path	High use [10] Medium use [8] Low use [5] No demonstrated use [0]
Continuity of Routes [maximum of 10]	Addition to Existing Facility	Link existing facilities [10] Extension of facilities [8] Addition to facilities [5] Other [0]
Priority [maximum of 5]	Route Hierarchy	High use [5] Medium use [3] Low use [1]

Note: Modified from RTA publication *How to Prepare a Pedestrian Access and Mobility Plan* (2002).

4. Actions to support cycling in Maitland

4.1 Introduction

This strategy adopts a behavioural model consisting of motivating factors and enabling factors. For a group of actors to adopt a particular behaviour both factors need to be active in their lives. Motivating factors are understood to be intrinsic desires, connected to peoples' identities that attract them to certain behaviours. Motivations for cycling include being fit and looking good and the pleasure of cycling. Because motivating factors are intrinsic to peoples' identities they are generally not within the power of agencies to influence. Hence when motivations are weak it's necessary to rely primarily on infrastructure measures.

Enabling factors are changes to:

- Peoples' environments.
- Their self-efficacy that lowers the perceived risks of acting.

In the case of cycling these include the existence of safe, efficient cycle routes, the personal confidence to cycle safely, knowledge of suitable routes, and bicycle facilities at destinations. In principle, enabling factors are within the power of agencies to influence, so they are the primary focus of this behaviour change strategy. The enabling factors for Maitland are presented in Section in Table 10.

4.1.1 The enablers for cycling in Maitland

Table 10 presents a summary of the key enabling factors for cycling in Maitland.

Table 10 The behavioural model for the cycling strategy

Components of the Model	Enabling Factors
Pre-trip/Individual Enablers – A combination of intrapersonal and social factors that influence one's self-efficacy to and acceptance of cycling	If Feasible <ul style="list-style-type: none"> • Better skills and confidence to ride with vehicular traffic on the road, especially where no bicycle facilities are provided • The basic skills and confidence to ride a bicycle, regardless of age, gender and ability • Road safety education for motorists to improve the relationship with cyclists • More, better and easily accessible information on bicycles routes, facilities and activities
Trip Enablers – A combination of cycling infrastructure, wayfinding and relationships with other road users	If Present <ul style="list-style-type: none"> • Greater separation from traffic for on road cycle lanes • Well maintained bicycle infrastructure • Bicycle routes that avoid steep hills • Bicycle routes that are connected and link with key destinations • Safe places to cross the highway • More off-road or separated bike paths and are away from the main road • Scenic and pleasant bike trails that are flat, less noisy and run through parks and reserves
End of Trip Enablers – Primarily concerned with the provision of appropriate facilities at destinations	If Present More and better bicycle parking at trip destinations across Maitland.

4.2 Bicycle infrastructure actions

Maps corresponding to the proposed bicycle routes shown in Table 11 are provided in Appendix A. It should be noted that the reference numbers in Table 11 are shown in no particular order. These project estimates total to around \$18M. It is noted that this list allows for Council to allocate funding in forward capital works programs, seek funding from external sources, and is to be included in Council's developer contributions framework.

Prioritisation of these routes is shown subsequently in Table 12, and this process allows Council to regularly review the projects listed in the program, and review prioritisation of the listed projects. Prioritisation may change to reflect changing community needs, or where opportunities exist to construct segments in an efficient manner (i.e. coordinated with roadworks activities for example).

Table 11 Proposed cycle improvements for Maitland

Town/Label reference	Route type	Location	Responsibility	Indicative Length (m)	Indicative Cost Note 1
Aberglasslyn 1	Off Road	Along Hunter River (Between Willow Tree Close - Aberglasslyn Road)	Council	990	\$495,000
Aberglasslyn 2	On Road	Aberglasslyn Road (Between Hunter River - Denton Park Drive)	Council	2300	\$300,000
Aberglasslyn 3	On Road	Denton Park Drive (Between Weblands Street - Aberglasslyn Road)	Council	180	\$25,000
Aberglasslyn 4	On Road	Waratah Close (Between Silky Oak Road - Kelly Circuit)	Council	130	\$20,000
Aberglasslyn 5	Off Road	Vikki Avenue (Between Niven Parade - Kelly Circuit)	Council	970	\$485,000
Aberglasslyn 6	On Road	Anambah Road (North of New England Highway)	Council	3680	\$480,000
Aberglasslyn 7	Off Road	McKeachie Drive (Between Aberglasslyn Road - Redgum Circuit)	Council	440	\$220,000
Ashtonfield 1	On Road	The Boulevard (South of Stronach Avenue)	Council	300	\$40,000
Ashtonfield 2	Off Road	Metford Road (Between Molly Morgan Drive - South Seas Drive)	Council	550	\$275,000
Ashtonfield 3	Off Road	South Seas Drive (Between New England Highway - Metford Road)	Council	1920	\$960,000
Ashtonfield 4	Off Road	Norfolk Street (Between Celebes Street - Tasman Close)	Council	400	\$200,000
Ashtonfield 5	Off Road	Dumaresq Parade (West of Mcleod Avenue)	Council	620	\$310,000
Bolwarra 1	Off Road	Paterson Road (Between Bolwarra Road - Tocal Road)	Council	1120	\$560,000

Town/Label reference	Route type	Location	Responsibility	Indicative Length (m)	Indicative Cost Note 1
Bolwarra 2	On / Off Road	Patterson Road (South of Bolwarra Road)	Council	1220	\$160,000
East Maitland 1	Off Road	Day Street (Between Morpeth Road - Victoria Street)	Council	1100	\$550,000
East Maitland 2	On Road	William Street/Brisbane Street/Richardson Street (Between Day Street - Chisholm Road)	Council	2380	\$310,000
East Maitland 3	On Road	High Street (Between Hodge Street - Brisbane Street)	Council	1770	\$235,000
East Maitland 4	On Road	Cumberland Street/Hodge Street (Between Morpeth Road - High Street)	Council	1020	\$135,000
East Maitland 5	On Road	Lindesay Street (Cumberland Street - High Street)	Council	630	\$85,000
East Maitland 6	On Road	Fieldsend Street/Turton Street (Between Brunswick Street - Chelmsford Drive)	Council	1220	\$160,000
East Maitland 7	On Road	Morpeth Road (Between Jenna Drive - Highlands Crescent)	Council	1490	\$195,000
Farley 1	Off Road	Wollombi Road (between Regiment Road and rail underbridge)	Council	300	\$150,000
Farley 2	On Road	Wollombi Road (west of rail underpass towards Old North Road)	Council	2000	\$260,000
Gillieston Heights 1	Off Road	Cessnock Road (South of New England Highway)	Council	5210	\$2,605,000
Largs 1	On Road	Paterson Road (Between Largs Avenue - Cabarita Close)	Council	260	\$35,000
Largs 2	On Road	Largs Avenue (Between Paterson Road - High Street)	Council	890	\$120,000
Maitland 1	On Road	Belmore Road (Between High Street - The Esplanade)	Council	330	\$45,000
Maitland 2	On Road	High Street (Between Belmore Road - New England Highway)	Council	1690	\$220,000
Maitland 3	On Road	Church Street (Between High Street - Steam Street)	Council	600	\$80,000
Maitland 4	On Road	Elgin Street (Between High Street - Athel Dombrain Drive)	Council	680	\$90,000
Maitland 5	On Road	Victoria Street (Between High Street - Athel Dombrain Drive)	Council	660	\$90,000
Maitland 6	On Road	Athel Dombrain Drive (Between Elgin Street - Old Rose Street)	Council	630	\$85,000
Maitland 7	On Road	Smyth Field (East of James Street)	Council	340	\$45,000
Maitland 8	On Road	High Street Railway Station Access Road	Council	150	\$20,000
Maitland 9	Off Road	New England Highway/Les Darcy Drive (Between Maitland Railway Station - High Street Railway Station) [partially completed]	RMS	730	\$365,000

Town/Label reference	Route type	Location	Responsibility	Indicative Length (m)	Indicative Cost Note 1
Maitland 10	Off Road	Elgin Street/Park Street (Between Les Darcy Road)	Council	1420	\$710,000
Maitland 11	On / Off Road	Mount Dee Road	Council	1250	\$165,000
Maitland to Morpeth 1	Off Road	Along river bank to Flat Road	Council	3450	\$1,700,000
Maitland to Morpeth 2	Off Road	From Pitnacree Road to Morpeth along river bank	Council	4130	\$2,065,000
Morpeth 1	On Road	Morpeth Road (Between Tank Street - Steamer Street)	Council	660	\$90,000
Morpeth 2	Off Road	Tank Street (Between Morpeth Road - Canterbury Drive)	Council	690	\$345,000
Morpeth 3	On Road	Swan Street (Between Tank Street - Edward Street)	Council	1230	\$160,000
Morpeth 4	On Road	Edward Street (Between Swan Street - Duckenfield Road)	Council	600	\$80,000
Raworth 1	On Road	Bushfarm Road (Between Pitnacree Road - Morpeth Road)	Council	2870	\$375,000
Raworth 2	On Road	Morpeth Road (South of Raworth Avenue)	Council	560	\$75,000
Rutherford 1	On Road	Fairfax Street (Between Denton Park Drive - Dunkley Street)	Council	980	\$130,000
Rutherford 2	Off Road	East of Fairfax Street (Between Joshua Close - Dunkley Street)	Council	800	\$400,000
Rutherford 3	Off Road	Weblands Street (Between Budgerie Drive - Vindin Street)	Council	1020	\$510,000
Rutherford 4	On Road	Avery Street (Between Aberglasslyn Road - Treasure Street)	Council	1220	\$160,000
Rutherford 5	Off Road	Aberglasslyn Road (Between Avery Street - Alexandra Avenue)	Council	1330	\$665,000
Rutherford 6	On Road	Racecourse Road (Between Bradmill Avenue - New England Highway)	Council	2300	\$300,000
Rutherford 7	On Road	Harvey Road/Logan Road (Between New England Highway - Ventura Close)	Council	740	\$100,000
Rutherford 8	On Road	Arthur Street/Ventura Close (Between Weblands Street - Brigantine Street) and Clayton Crescent	Council	1230	\$160,000
Rutherford 9	On Road	Brigantine Street (Between Regiment Roads)	Council	1190	\$155,000
Rutherford 10	On / Off Road	New England Highway (Between Arthur Street - Wollombi Road and Wollombi Road)	RMS / Council	310	\$45,000
Rutherford 11	On Road	Woodberry Street (Between Arthur Street - Melbee Street)	Council	210	\$30,000
Rutherford 12	On Road	Bunning Avenue (Between Dunkley Street - Alexandra Avenue)	Council	340	\$45,000

Town/Label reference	Route type	Location	Responsibility	Indicative Length (m)	Indicative Cost Note 1
Telarah 1	On Road	Young Street/Macarthur Street/George Street (Between New England Highway and South Street)	Council	1080	\$145,000
Telarah 2	Off Road	Lismore Street (Between William Street - Green Street)	Council	160	\$80,000
Telarah 3	On Road	New England Highway/Johnson Street/High Street (Between Aberglasslyn Road - Ledsam Street)	RMS/Council	1460	\$190,000
Tenambit 1	On Road	Goldingham Street (Between Blackley Avenue - Collinson Street)	Council	750	\$100,000
Tenambit 2	On Road	Laurie Drive/Jenna Drive	Council	470	\$65,000
Tenambit 3	Off Road	Goldingham Street (Between Stanton Drive - Blackley Avenue)	Council	600	\$300,000
Tenambit 4	Off Road	Canterbury Drive (Between Tank Street - Stanton Drive)	Council	850	\$425,000
Thornton 1	On / Off Road	Karuah Street (Between Haussman Drive - Thornton Road) and Haussman Drive (Between Raymond Terrace Road - Government Road)	Council	2210	\$290,000
Thornton 2	Off Road	South of Taylor Avenue	Council	290	\$145,000
Thornton 3	On / Off Road	Holford Crescent/Welwin Crescent	Council	490	\$65,000
Thornton 4	On Road	Thornton Road (South of Karuah Street)	Council	1260	\$165,000
Thornton 5	On Road	Government Road (North of Avarde Close)	Council	670	\$90,000
Walka Waterworks 1	Off Road	Waterworks Road	Council	1760	\$880,000
Walka Waterworks 2	On Road	Sempill Street / Oakhampton Road	Council	1780	\$235,000
Total					\$22,050,000

Note 1: Estimates have been built up based on unit rates provided by Council from previous project costs and rounded up to the nearest \$5,000. Rates are subject to change dependent on detail design, off road or on road location, clashes with infrastructure and utilities and construction activities coordinated with road rehabilitation for example.

4.2.1 Prioritisation of bicycle infrastructure projects

Table 12 ranks the proposed bicycle routes for Maitland based on the modified Weighted Criteria Scoring System.

Table 12 Prioritisation of bicycle infrastructure projects

Town / Label Reference	Land Use				Traffic Impact	Safety		Facility Benefits	Continuity of Routes		Priority	
	No. of generators	Land use type	Proximity to generators	Future development	Road hierarchy	Hazardous area	Cycle crashes	Demonstrated path	Addition to existing facility	Route hierarchy	Total Score	Priority Rank
Maitland 2	10	10	10	1	8	0	5	8	10	5	67	1
Telarah 3	5	8	10	1	15	0	8	5	10	5	67	2
Maitland 3	8	10	10	1	8	0	8	5	8	5	63	3
Rutherford 8	8	8	10	1	8	0	5	8	10	3	61	4
Maitland 9	8	5	10	1	15	0	0	5	10	5	59	5
Telarah 1	8	10	10	1	8	0	0	8	10	3	58	6
East Maitland 4	5	10	10	1	8	0	0	10	10	3	57	7
East Maitland 1	8	5	10	1	8	0	0	8	10	5	55	8
East Maitland 2	10	10	10	1	8	0	0	5	8	3	55	9
East Maitland 3	5	10	10	1	8	0	5	5	8	3	55	10
Rutherford 10	5	5	10	1	15	0	0	5	8	5	54	11
Largs 2	8	10	10	1	8	0	0	5	8	3	53	12
Rutherford 12	5	8	10	1	8	0	0	8	10	3	53	13
Rutherford 4	5	8	8	1	8	0	5	5	10	3	53	14
East Maitland 6	5	10	10	1	8	0	0	5	10	3	52	15
Thornton 1	5	5	10	3	8	0	5	5	8	3	52	16
Rutherford 1	5	5	10	1	8	0	0	8	10	3	50	17

Town / Label Reference	Land Use				Traffic Impact	Safety		Facility Benefits	Continuity of Routes		Priority	
	No. of generators	Land use type	Proximity to generators	Future development	Road hierarchy	Hazardous area	Cycle crashes	Demonstrated path	Addition to existing facility	Route hierarchy	Total Score	Priority Rank
Rutherford 2	5	5	10	1	8	0	0	8	10	3	50	18
Rutherford 3	8	10	10	1	8	0	0	5	5	3	50	19
Rutherford 5	8	8	5	3	8	0	5	5	5	3	50	20
Thornton 3	5	10	10	1	8	0	0	5	8	3	50	21
Thornton 2	5	8	10	1	8	0	0	5	8	3	48	22
Ashtonfield 2	5	5	10	1	8	0	0	5	10	3	47	23
Ashtonfield 3	5	5	10	1	8	0	0	5	10	3	47	24
East Maitland 7	5	5	10	1	8	0	0	5	10	3	47	25
Maitland 10	8	5	10	3	8	0	0	10	0	3	47	26
Maitland 7	8	0	10	3	8	0	0	5	10	3	47	27
Maitland 1	5	5	10	1	8	0	0	8	5	3	45	28
Rutherford 11	5	5	10	1	8	0	0	5	8	3	45	29
Bolwarra 1	0	5	10	3	8	0	0	5	10	3	44	30
Bolwarra 2	0	5	10	3	8	0	0	5	10	3	44	31
Maitland 4	5	10	10	1	8	0	0	5	0	5	44	32
Maitland 8	5	8	10	3	8	0	0	5	0	5	44	33
Thornton 4	5	0	10	5	8	0	0	5	8	3	44	34
Walka Waterworks 2	5	0	5	5	8	0	0	8	8	5	44	35
Maitland 5	5	10	10	2	8	0	0	5	0	3	43	36
Ashtonfield 1	5	0	10	3	8	0	0	5	10	1	42	37

Town / Label Reference	Land Use				Traffic Impact	Safety		Facility Benefits	Continuity of Routes		Priority	
	No. of generators	Land use type	Proximity to generators	Future development	Road hierarchy	Hazardous area	Cycle crashes	Demonstrated path	Addition to existing facility	Route hierarchy	Total Score	Priority Rank
Rutherford 6	5	8	10	3	8	0	0	0	5	3	42	38
Walka Waterworks 1	5	0	5	5	8	0	0	8	5	5	41	39
Ashtonfield 4	5	5	10	1	8	0	0	5	5	1	40	40
Ashtonfield 5	0	5	10	1	8	0	0	5	10	1	40	41
East Maitland 5	5	5	10	1	8	0	0	5	5	1	40	42
Morpeth 3	5	5	10	1	8	0	0	8	0	3	40	43
Rutherford 7	5	5	10	1	8	0	0	5	5	1	40	44
Aberglasslyn 6	5	5	10	3	8	0	0	0	5	3	39	45
Morpeth 1	0	0	8	5	8	0	0	5	8	3	37	46
Morpeth 4	5	5	10	1	8	0	0	5	0	3	37	47
Rutherford 9	0	5	5	1	8	0	0	5	10	1	35	48
Telarah 2	0	5	8	1	8	0	0	0	10	3	35	49
Tenambit 1	0	5	5	1	8	0	0	5	8	3	35	50
Maitland 6	0	0	8	5	8	0	0	5	5	3	34	51
Morpeth 2	0	5	10	5	8	0	0	5	0	1	34	52
Raworth 2	0	5	0	3	8	0	0	5	10	3	34	53
Aberglasslyn 3	0	5	0	1	8	0	0	5	10	3	32	54
Aberglasslyn 7	0	5	0	3	8	0	0	5	10	1	32	55
Tenambit 2	0	5	0	3	8	0	0	5	10	1	32	56
Aberglasslyn 2	0	5	0	5	8	0	0	5	5	3	31	57

Town / Label Reference	Land Use				Traffic Impact	Safety		Facility Benefits	Continuity of Routes		Priority	
	No. of generators	Land use type	Proximity to generators	Future development	Road hierarchy	Hazardous area	Cycle crashes	Demonstrated path	Addition to existing facility	Route hierarchy	Total Score	Priority Rank
Thornton 5	0	0	10	5	8	0	0	0	5	3	31	58
Maitland to Morpeth 1	5	0	0	1	5	0	0	10	5	5	31	59
Maitland to Morpeth 2	5	0	0	1	5	0	0	10	5	5	31	60
Gillieston Heights 1	0	0	8	5	8	0	0	0	5	3	29	61
Aberglasslyn 4	0	5	0	1	8	0	0	0	10	3	27	62
Raworth 1	0	0	0	5	8	0	0	5	8	1	27	63
Largs 1	0	0	0	3	8	0	0	0	10	3	24	64
Tenambit 3	0	0	5	5	8	0	0	5	0	1	24	65
Aberglasslyn 1	0	0	0	5	8	0	0	0	8	1	22	66
Tenambit 4	0	5	0	3	8	0	0	5	0	1	22	67
Farley 1	0	5	0	1	10	0	0	0	5	1	22	68
Farley 2	0	5	0	1	10	0	0	0	5	1	22	69
Maitland 11	0	0	0	3	8	0	0	0	8	1	20	70
Aberglasslyn 5	0	5	0	1	8	0	0	0	0	1	15	71

4.3 Bicycle parking

The provision of appropriate bicycle parking facilities will encourage people to ride to their destination. Bicycle parking needs to be safe, secure, convenient and meet the needs of a wide range of cyclists. Two key factors to consider are the type of facility required and the location.

Table 13 identifies the most common locations where bicycle parking facilities are required and indicates an appropriate type of bicycle parking facility that should be provided.

To ensure the continued use of bicycle parking facilities, they must be maintained. Poorly maintained facilities will have an adverse effect on patronage and the wider use of bicycles as a means of transport. Maintenance costs should also be factored in to ongoing budgeting.

Section 10 of the *Guide to Traffic Engineering Practice, Part 14 – Bicycles* (AUSTROADS, 1999) provides further information on bicycle parking and end-of-trip facilities suitable for low volume parking locations, typically suitable for most main street and trip generating locations.

Table 13 Bicycle parking facilities

Location	Appropriate Parking Facility
Shopping centres or business districts.	Individual and small clusters of bicycle parking rails.
Shopping complexes. Swimming pools. Libraries. Markets.	Clusters of bicycle parking rails at main entrances.
Work places. Primary and Secondary schools.	Groups of bicycle parking rails within an enclosure.
Train stations.	Groups of bicycle parking rails within an enclosure or individual bicycle lockers.
Apartments or residential complexes.	Groups of bicycle parking rails within an enclosure such as a car park.

4.4 Signage

Signage for the bicycle network should be provided in conjunction with new facilities where possible. The main functions of signage for bicycle network facilities are:

- To assist users to find their way around the network; and
- To warn users of identifiable potential hazards within the riding environment.

The most important function of directional signage is to help users find their way around the network. Directional signage reinforces network connectivity and coherence and provides high visibility and recognition to the collection of routes which make up the wider cycle network.

In order to avoid ambiguity and conflict with motorised road users and bicycle riders, a completely independent system of signage for cyclists should be used. Council officers are recommended to consult with bicycle network officers from the RMS and adjacent councils to ensure a consistent, logical and useable set of destinations are selected.

Yellow diamond shaped warning signs are used to alert riders to changed or potentially hazardous path or road conditions. This type of signage is similarly used to alert other road users of intersecting or merging bicycle movements.

4.5 Behaviour change programs

This section propose a number of behaviour change programs and activities that support the proposed bicycle infrastructure projects, and activate the key motivating factors identified through the community engagement process.

The key motivating factors identified through the community engagement process are:

- Health, fitness and to exercise.
- Social interactions (e.g. spending time with family, friends or to accompany children or other riders).
- Fun and enjoyment.
- To enjoy the outdoors.

The decision to cycle is rarely made in private without outside influence. It usually depends on an interaction between individual desires and abilities, social influences and the physical environment. Much attention has been given to getting the cycling infrastructure right. However as a result, social influences are often neglected. As a result, a number of the initiatives seek to mobilise social influence.

4.5.1 Program 1: Capacity building classes for beginners

Purpose

The purpose of this program is to provide people within the community who would like to take up cycling with the skills, knowledge and confidence to cycle.

Objectives

To provide training in how to ride a bicycle on the road and on shared paths (including guidance on the rules of using shared paths)

To provide people with the knowledge to buy a bicycle and associated equipment that is appropriate for their needs

To provide people with the skills and knowledge to maintain a bicycle

To provide people with the knowledge to plan a journey (including where to find information on routes)

Activities

Develop a curriculum for bicycle training in collaboration with a professional training body or service provider;

Determine frequency of classes: run one class as a permanent fixture in the council calendar of events, and then run additional classes based on demand;

Explore opportunities to run events with adjacent LGAs to manage demand;

Determine appropriate facilities for classes, taking into account accessibility for the wider community;

Widely advertise classes through a range of mediums and maximize exposure to members of the community who would not normally participate in cycling events, groups etc.

Establish a system for capturing information on why people attended, their experience and what happened to their participation in cycling after attending (document some stories of change from participants for promotion through Council website and newsletters);

Explore opportunities to provide classes specifically for school children, within schools;

Develop a resources pack for people to download directly from council website, providing basic guidance on bicycle skills, knowledge and awareness for people who are unable or initially unwilling to attend the classes.

Partners

- Local advocacy groups
- Transport NSW approved cycling training providers (e.g. Austcycle)
- Police

Actors

- Young children and their parents
- Senior citizens
- Women (women only groups)
- All members of the community predisposed to cycling

Indicative budget

\$15,000 AUD per annum.

4.5.2 Program 2: Coexistence campaign

Purpose

The purpose of this program is to improve the relationship between users of shared space, both on-road and off-road (e.g. on shared paths).

Objectives

Improve the awareness of road users and shared path users of the code of conduct / rules for sharing space.

Create empathy between road users and shared path users.

Activities

Develop a code of conduct for the use of shared paths (drawing on the availability of existing resources – see City of Sydney): run a series of events targeting shared paths across the LGA, distributing the leaflets to all shared path users – include rewards for people who are displaying positive behaviours in-line with the code of conduct;

Use these events to gather information, through interaction and observation, on the issues that are influencing behaviour on the shared paths – document this data and information and use it to develop further initiatives to improve how people share the paths.

Run a series of workshops involving cyclists and motorists to enable road users to share needs and motivations in a friendly and fun environment: work with RMS NSW and (if possible) adjacent LGAs – engage participants in exercises where they take the other persons' perspective

These workshops must be carefully planned and professionally facilitated to avoid tensions to surface and conflict to emerge.

The participants selected for the workshops should be interested in finding common ground, as a starting point for their involvement.

Careful attention should be paid to documenting the workshops, capturing anecdotal evidence of changing attitudes.

The workshops should be followed up with a promotional campaign to disseminate the stories of change that emerge from the workshop.

Partners

- Local advocacy groups
- RMS NSW
- Local sports cycling clubs
- Police

Actors

- Users of shared paths
- Local motorists
- Existing cyclists
- New cyclists

Indicative budget

\$10,000 AUD per annum.

4.6 Promotion and marketing actions

The following recommendations are proposed for the promotion and marketing of cycling in Maitland:

In order to normalize cycling among the community, all cycling related marketing material (posters, brochures, fliers, website content etc) should use images:

1. of normal people riding in normal clothes;
2. of people riding sit-up, electric / power assisted and cargo bicycles
3. of both genders but focus more on women;
4. of senior citizens;

Create an easily accessible map of the bicycle network, to include the location of bicycle facilities, and highlighting specific routes for transport and/or leisure trips;

Promote cycling for travel to all Council run and sponsored events: provide bicycle parking at major events.

Create a one-stop-shop cycling webpage on the Council website.

Promote all cycling activity in Council newsletters, including the outcomes of behaviour change programs and progress on developing the bicycle network.

4.7 Hunter Expressway

In the period since completing the first draft of the plan the Hunter Expressway has been opened to traffic. The Hunter Expressway now offers a dual carriageway with wide shoulder from Heddon Greta to Wallsend at the western extents of the Newcastle urban area. The vertical alignment and wide shoulder of the expressway offer an attractive alternative route for cyclists travelling between Maitland and Newcastle.

Connections between Maitland and the expressway are via Cessnock Road and Mount Vincent / Buchanan Road. An off road facility near Cessnock Road is reflected in the projects listed in Table 11. Mount Vincent / Buchanan Road would require a significant upgrade, or alternatively an extensive off road facility. This route is not supported.

5. Delivering the Strategy

5.1 Maintenance

5.1.1 Maintenance considerations

Maintaining bicycle paths to be in a suitable condition is a key requirement to ensuring the plan's objectives are achieved. If the bicycle facilities are not adequately maintained to a suitable level of service, cyclists are discouraged from using them. Worse, cyclists may have the tendency to swerve into the path of vehicular traffic in order to avoid sections of deteriorated surface conditions, posing a safety hazard to both themselves and general traffic.

The importance of maintaining road assets and the financial impacts of not doing so is well known to most road authorities, including Councils. However, maintenance of bicycle paths after construction is less commonly incorporated into asset management programs.

At a minimum, Council's maintenance program for its bicycle network infrastructure should follow the standards it keeps for maintaining its road assets. An important consideration to make is to incorporate bicycle path maintenance

within the overall road network asset management program.

5.1.2 Maintenance items

As indicated in the *Guide to Traffic Engineering Practice, Part 14: Bicycles* (AUSTROADS, 1999), regular maintenance activities on bicycle paths should include:

- Filling of cracks
- Trimming or removal of grass
- Sweeping of paths
- Re-painting of pavement markings
- Cleaning of signs
- Trimming of trees and shrubs to maintain safe clearances and sight distances.

Other considerations may include regular audits of railroad crossings and storm drain grates to ensure they are safe for cyclists.

5.2 Monitoring

The success of a plan or strategy can only be assessed if adequate monitoring or performance measures are included. The monitoring process will identify if the plan is achieving the desired behaviour change or facilitating the increased use of bicycles in

the LGA. Such indicators also ensure that throughout the development of the plan, or program of works, the initiatives align with national, state and local planning objectives.

Identifying a monitoring method appropriate to a plan or strategy is critical to ensure time and resources are not misspent on processes that result in un-useful or irrelevant data collection and/or analysis. The measures outlined below present a range of options that could be easily tracked by Council officers and have been successfully used in previous Bike Plans.

Modal split

This measure provides an indication of demand for various modes of transport at an aggregate level. Typically modes would be broken down into; private vehicle; train; bus and other (which would include cyclists).

This type of data can provide an indication of the overall level of cycling use in the LGA. The percentage of cyclists can be obtained from the journey to work component of the Census or through the Household Travel Survey.

Vehicle kilometres travelled (VKT)

This measure also provides an indication as to the quality of the transport system within the region. Less vehicle kilometres travelled would imply that more residents utilise either active transport or public transport services in the LGA.

Road injuries

Road injury monitoring, and in particular for cyclists and pedestrians, provides a reasonably accurate indication as to the levels of safety that new strategies and plans have instigated, and as to whether targets are being achieved. Such statistics also highlight high risk zones that require further attention and planning.

Cycleway usage

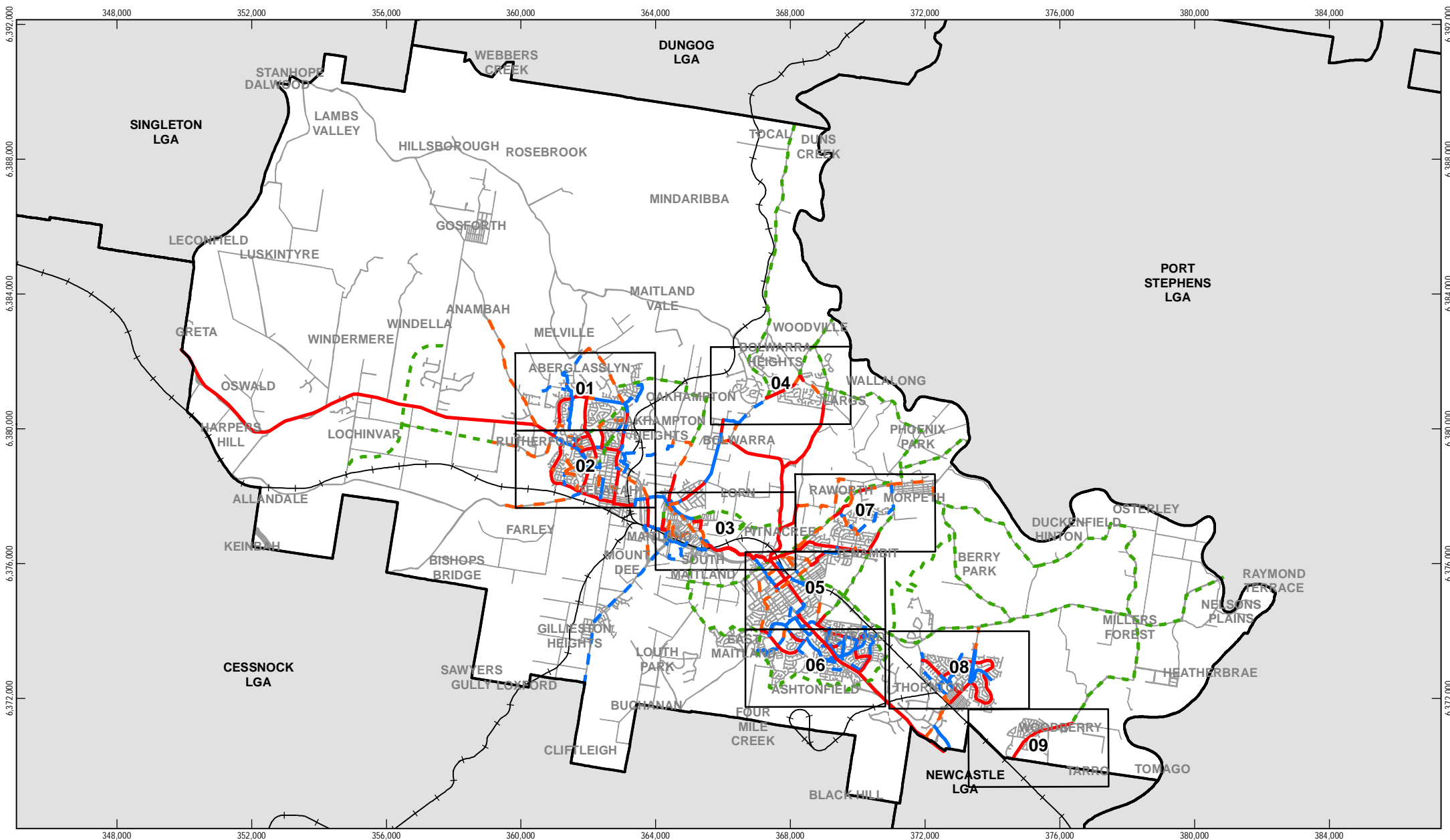
Performing regular cyclist counts is a highly effective way of determining the usage of cycle ways. Measurement methods would have to be standardised to ensure valid data is collected and is comparable across time periods. Consistent increases in usage would imply new cycle routes and improved conditions have provided a more efficient, safer network which is suitable for a larger proportion of the population.

Data availability

It should also be noted that data availability is one of the key criteria for evaluating a projects success. Before one or more monitoring methods are adopted, the quality and quantity of data required must be carefully considered in the context of existing data sets and potential data sets.

Appendices

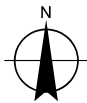
Appendix A – Bicycle network proposals



1:150,000 Paper Size A4

0 1,000 2,000 3,000 4,000
Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

Maitland Cycleways

- On-road, Existing
- Off-road, Existing
- On-road, Proposed
- Off-road, Proposed
- - - Future Indicative Link

- Railway
- Maitland Roads
- LGA Boundaries
- Cycleways Map Grid



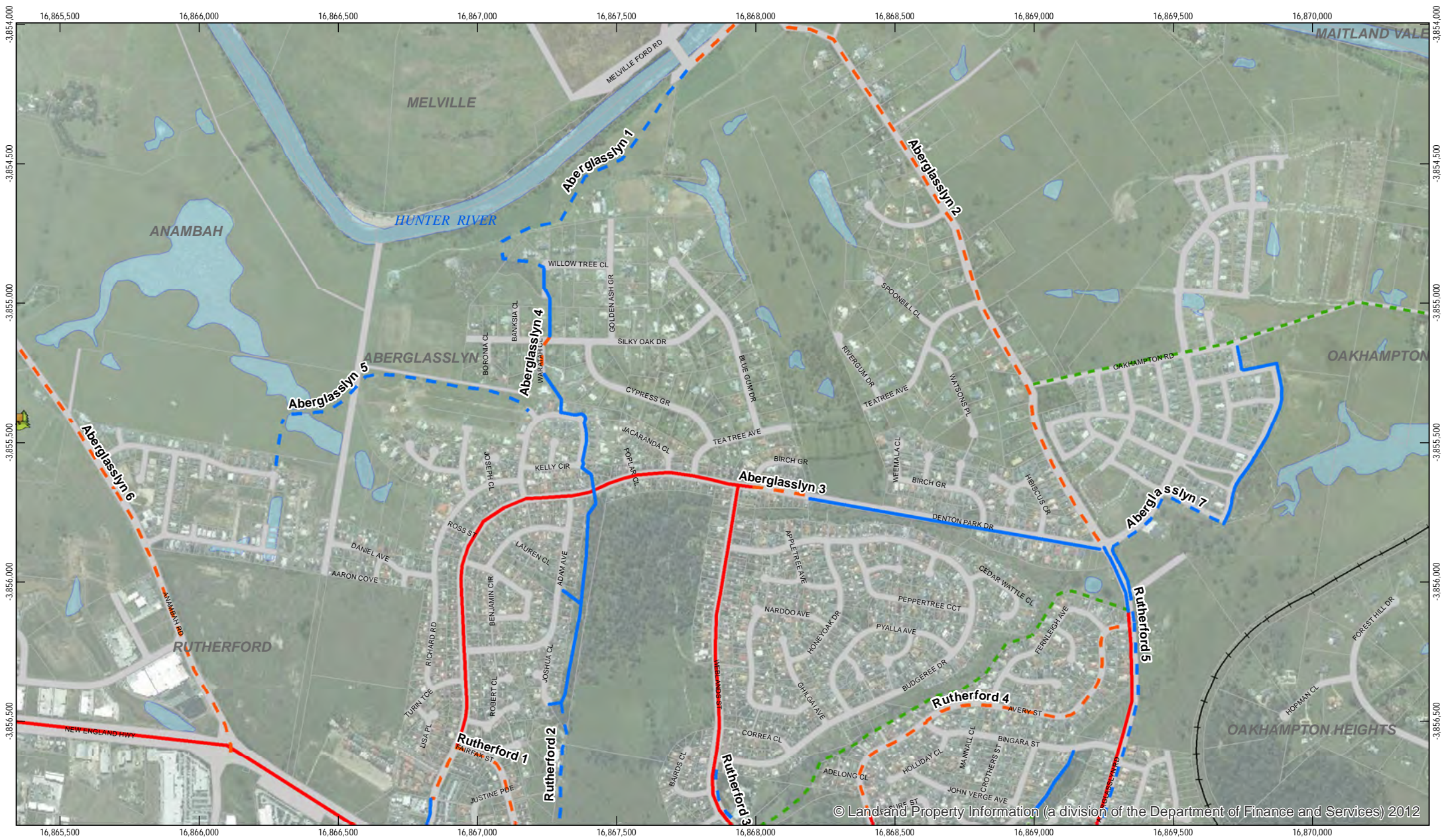
CLIENTS | PEOPLE | PERFORMANCE

Maitland City Council
Maitland Cycling Strategy

Job Number | 31-27895
Revision | B
Date | 10 JUN 2014

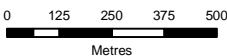
Maitland City Council
Cycleways Routes Index Map

Figure 2

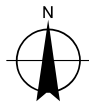


© Land and Property Information (a division of the Department of Finance and Services) 2012

1:18,000 Paper Size A4



Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxiliary Sphere



LEGEND

Maitland Cycleways

- On-road, Existing (Red solid line)
- On-road, Proposed (Orange dashed line)
- Off-road, Existing (Blue solid line)
- Off-road, Proposed (Blue dashed line)
- Future Indicative Link (Green dashed line)



School

Hospital

Recreation

Park

Shop

Railway Station

Railway

- LGA Boundaries (Black outline)
- Cadastre (Light grey fill)
- Maitland Roads (Dark grey fill)
- Waterways (Blue fill)

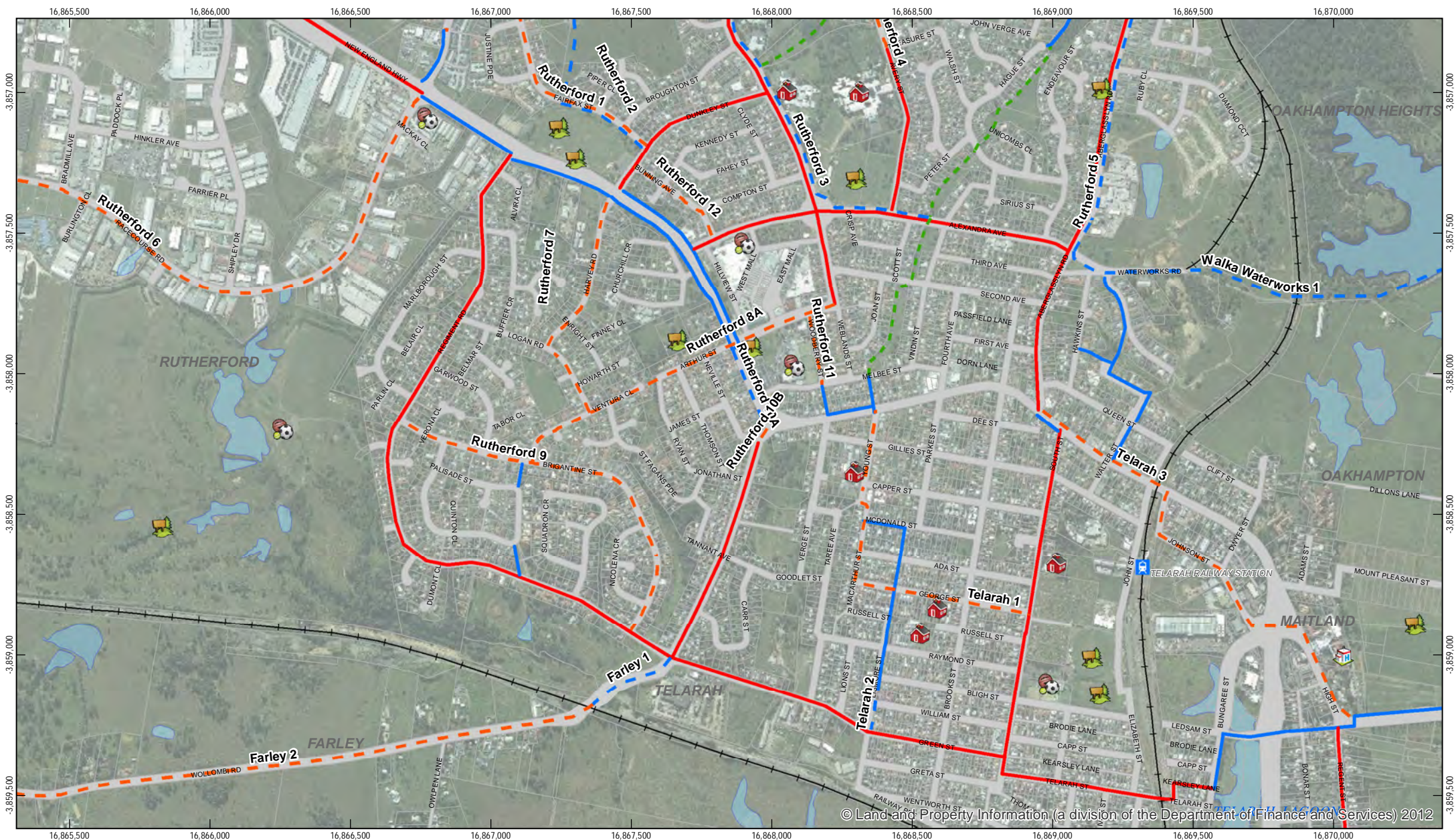


CLIENTS | PEOPLE | PERFORMANCE

Maitland City Council

Job Number 31-27895
Revision C
Date 07 Nov 2014

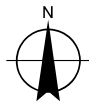
Figure 2-01



1:18,000 Paper Size A4



Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxiliary Sphere



LEGEND

Maitland Cycleways

- On-road, Existing
- Off-road, Existing
- On-road, Proposed
- Off-road, Proposed
- - - Future Indicative Link



LGA Boundaries

- Cadastre
- Maitland Roads
- Waterways

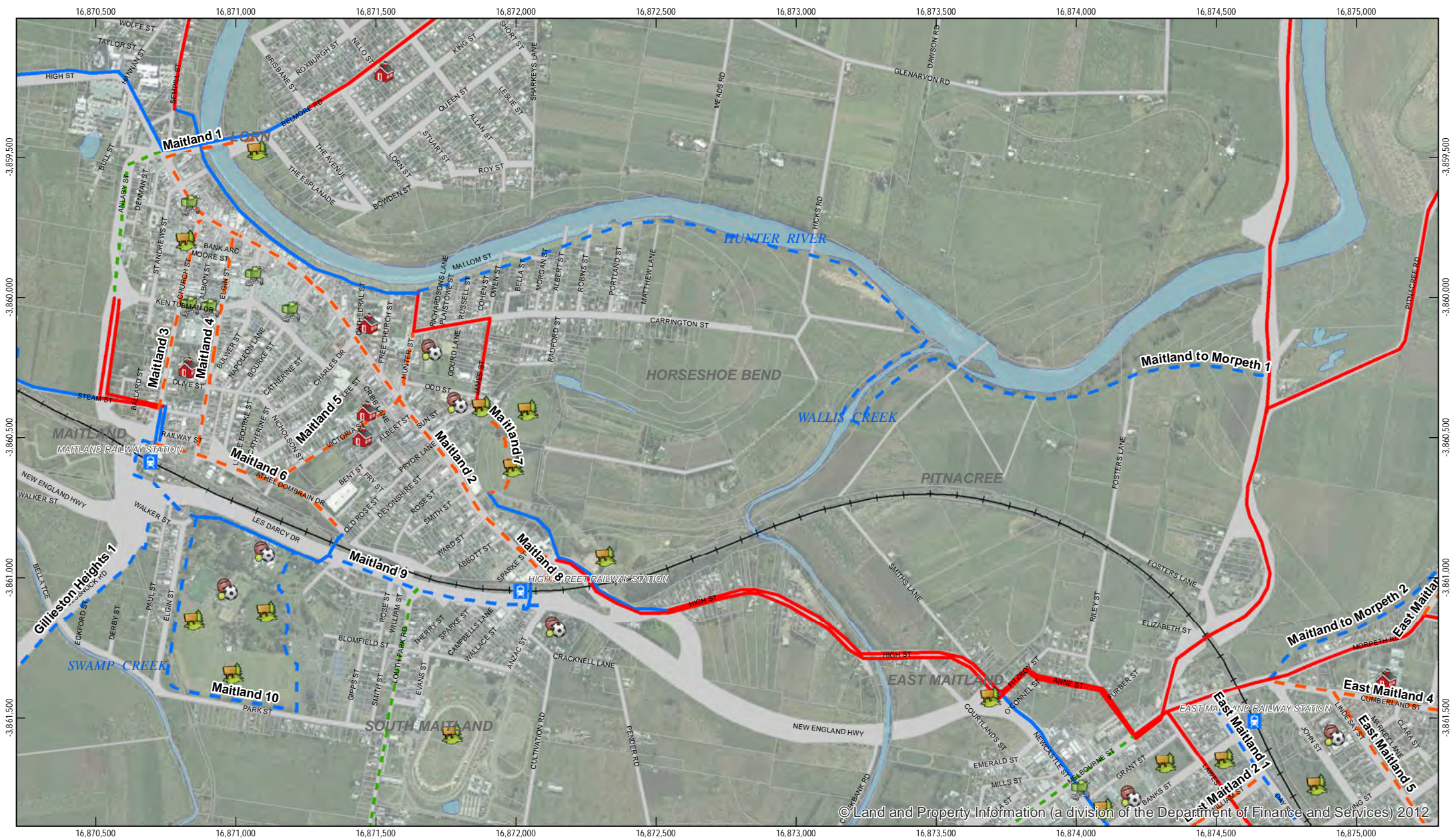


CLIENTS | PEOPLE | PERFORMANCE

Maitland City Council

Job Number 31-27895
Revision C
Date 07 Nov 2014

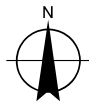
Figure 2-02



1:18,000 Paper Size A4



Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxiliary Sphere



LEGEND

Maitland Cycleways

- On-road, Existing
- Off-road, Existing
- On-road, Proposed
- Off-road, Proposed
- - - Future Indicative Link



School

Hospital

Recreation



Park

Shop

Railway Station

Railway

LGA Boundaries

Cadastre

Maitland Roads

Waterways



CLIENTS | PEOPLE | PERFORMANCE

Maitland City Council

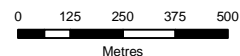
Job Number 31-27895
Revision C
Date 07 Nov 2014

Figure 2-03

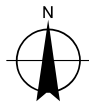


© Land and Property Information (a division of the Department of Finance and Services) 2012

1:18,000 Paper Size A4



Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxiliary Sphere



LEGEND

Maitland Cycleways

- On-road, Existing
- Off-road, Existing
- On-road, Proposed
- - - Off-road, Proposed
- - - Future Indicative Link



School



Hospital



Recreation



Park



Shop



Railway Station



Railway

- LGA Boundaries
- Cadastre
- Maitland Roads
- Waterways

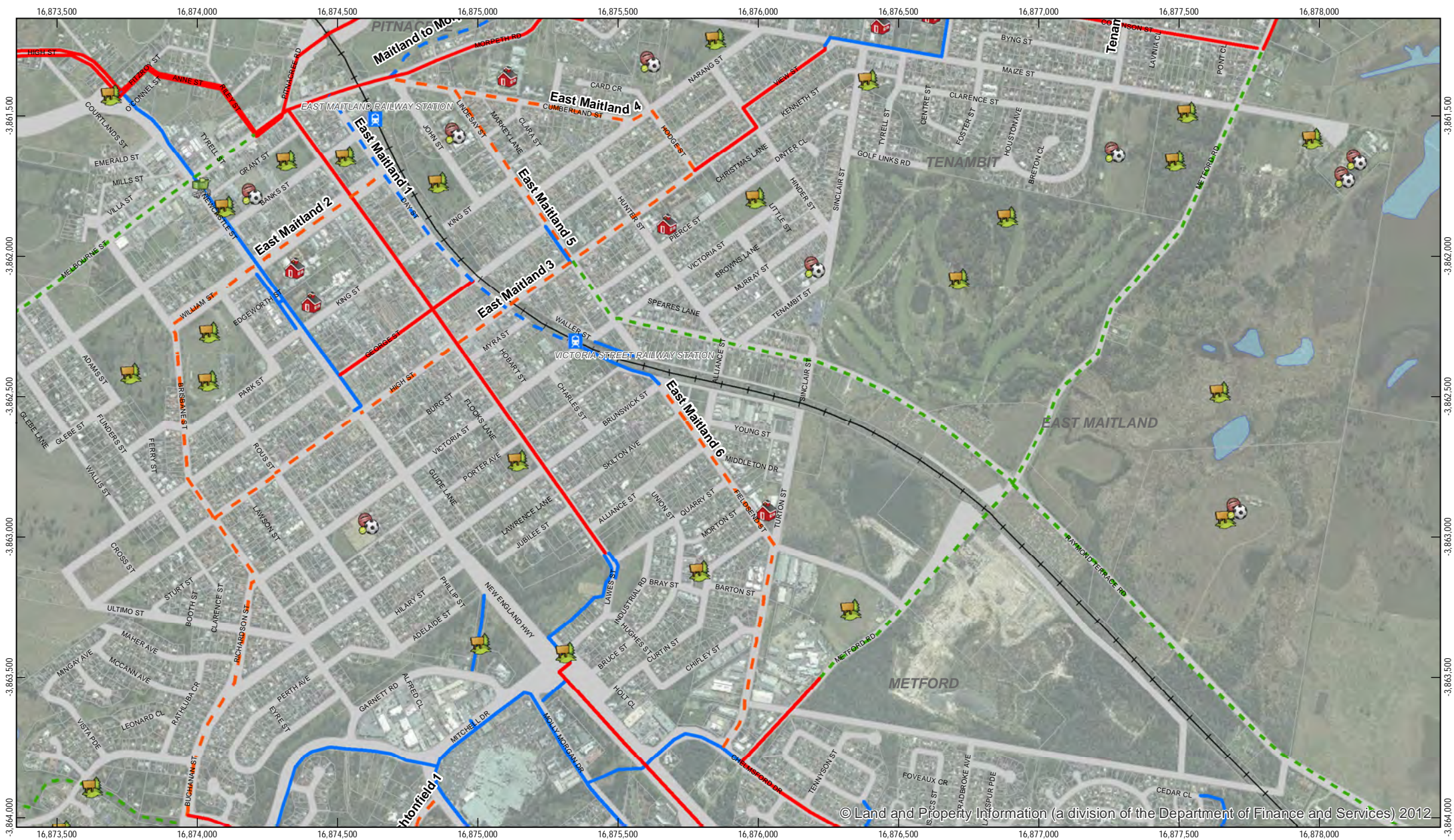


CLIENTS | PEOPLE | PERFORMANCE

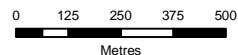
Maitland City Council

Job Number	31-27895
Revision	C
Date	07 Nov 2014

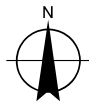
Figure 2-04



1:18,000 Paper Size A4



Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxiliary Sphere



LEGEND

Maitland Cycleways

- On-road, Existing
- Off-road, Existing
- - - On-road, Proposed
- - - Off-road, Proposed
- - - Future Indicative Link



- LGA Boundaries
- Cadastre
- Maitland Roads
- Waterways



Maitland City Council

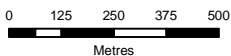
Job Number | 31-27895
Revision | C
Date | 07 Nov 2014

Figure 2-05

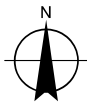


© Land and Property Information (a division of the Department of Finance and Services) 2012

1:18,000 Paper Size A4



Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxiliary Sphere



LEGEND

Maitland Cycleways

- On-road, Existing
- On-road, Proposed
- Off-road, Existing
- - - Off-road, Proposed
- - - Future Indicative Link



Maitland City Council

Job Number | 31-27895
Revision | C
Date | 07 Nov 2014



CLIENTS | PEOPLE | PERFORMANCE

Figure 2-06

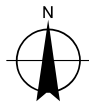


© Land and Property Information (a division of the Department of Finance and Services) 2012

1:18,000 Paper Size A4



Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxiliary Sphere



LEGEND

Maitland Cycleways

- On-road, Existing
- On-road, Proposed
- Off-road, Existing
- - Off-road, Proposed
- - - Future Indicative Link



CLIENTS | PEOPLE | PERFORMANCE

Maitland City Council

Job Number 31-27895
Revision C
Date 07 Nov 2014

Figure 2-07

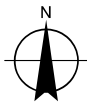


© Land and Property Information (a division of the Department of Finance and Services) 2012

1:18,000 Paper Size A4



Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxiliary Sphere



LEGEND

Maitland Cycleways

- On-road, Existing
- Off-road, Existing
- On-road, Proposed
- - - Off-road, Proposed
- - - Future Indicative Link



School

Hospital

Recreation



Park

Shop

Railway Station



Railway

Railway

Railway

- LGA Boundaries
- Cadastre
- Maitland Roads
- Waterways



CLIENTS | PEOPLE | PERFORMANCE

Maitland City Council

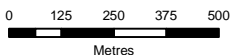
Job Number | 31-27895
Revision | C
Date | 07 Nov 2014

Figure 2-08

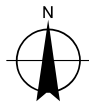


© Land and Property Information (a division of the Department of Finance and Services) 2012

1:18,000 Paper Size A4



Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxiliary Sphere



LEGEND

Maitland Cycleways

- On-road, Existing
- Off-road, Existing
- - - Off-road, Proposed
- - - On-road, Proposed
- - - Future Indicative Link



- LGA Boundaries
- Cadastre
- Maitland Roads
- Waterways

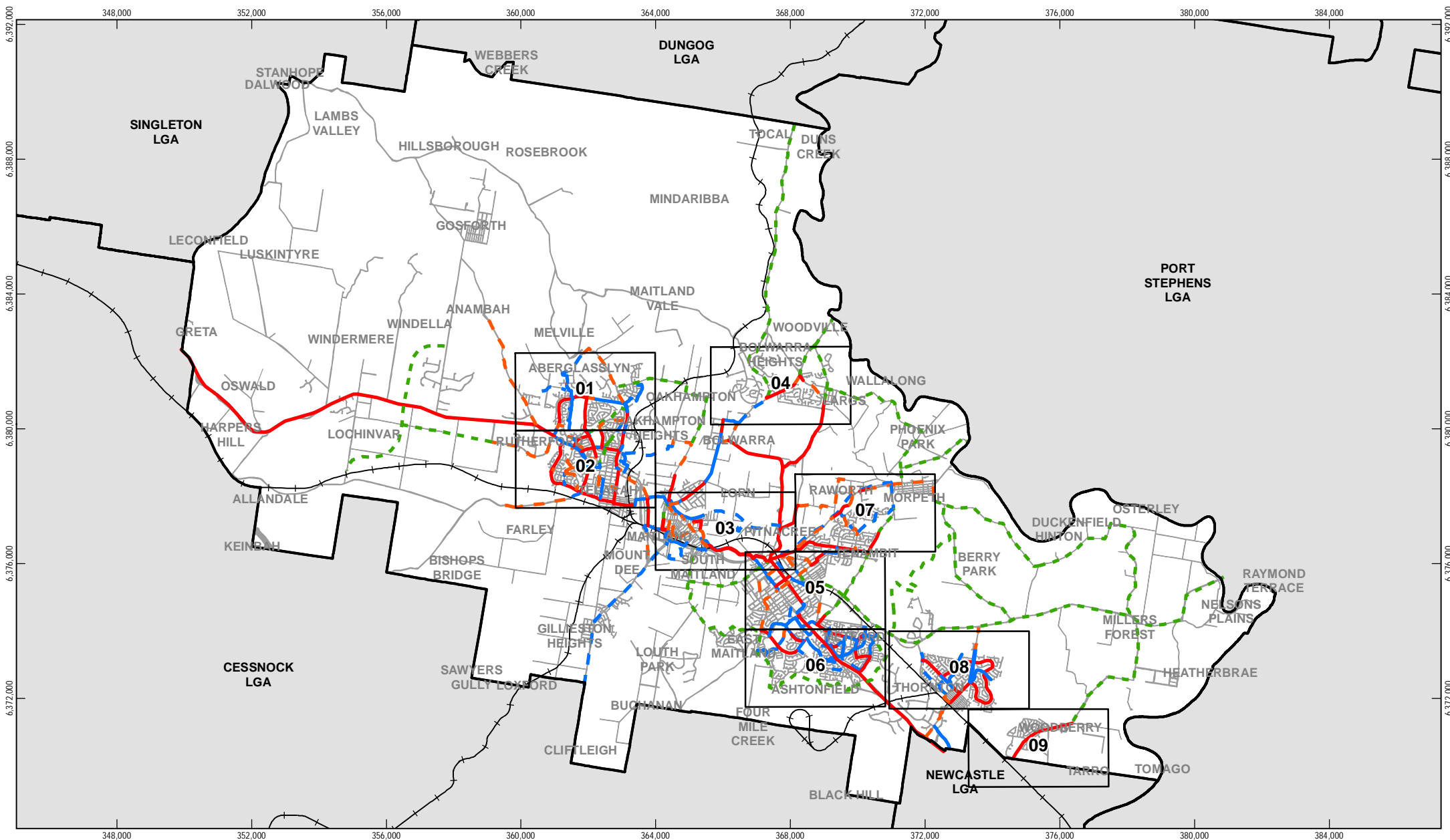


CLIENTS | PEOPLE | PERFORMANCE

Maitland City Council

Job Number | 31-27895
Revision | C
Date | 07 Nov 2014

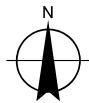
Figure 2-09



1:150,000 Paper Size A4

0 1,000 2,000 3,000 4,000
Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



LEGEND

Maitland Cycleways

- On-road, Existing
- On-road, Proposed
- Off-road, Existing
- Off-road, Proposed
- Future Indicative Link

- Railway
- Maitland Roads
- LGA Boundaries
- Cycleways Map Grid



CLIENTS | PEOPLE | PERFORMANCE

Maitland City Council
Maitland Cycling Strategy

Job Number | 31-27895
Revision | C
Date | 07 Nov 2014

Maitland City Council
Cycleway Routes Index Map

Figure 3

G:\22\17305\GIS\Maps\Deliverables\31_27895_03_CyclewaysRoutesMPSIndexMap_RevC.mxd

Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 T 61 2 4979 9999 F 61 2 4979 9988 E ntlmail@ghd.com W www.ghd.com.au

© 2011. Whilst every care has been taken to prepare this map, GHD and Maitland City Council make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Maitland Council: CrashStats, Cycleway Routes, Cadastre, Roads, LGA Boundary, 2011; Created by: gmodiarmid

Appendix B – Crash statistics

GHD


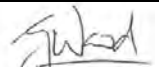
180 Lonsdale Street
Melbourne, Victoria 3000
T: (03) 8687 8000 F: (03) 8687 8111 E: melmail@ghd.com.au

© GHD 2014

This document is and shall remain the property of GHD. The document may only be used for the purpose for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.

\\ghdnet\ghd\AU\Newcastle\Projects\22\17305\WP\106264.docx

Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	N Buchanan	J Daly	<i>J Daly</i>	J Daly	<i>J Daly</i>	26/4/12
1	N Buchanan	J Daly	<i>J Daly</i>	J Daly	<i>J Daly</i>	05/02/13
2	N Buchanan	J Daly	<i>J Daly</i>	J Daly	<i>J Daly</i>	22/03/13
3	N Buchanan / GWood	T Mulherin	<i>T Mulherin</i>	T Mulherin	<i>T Mulherin</i>	13/05/14
4	N Buchanan / GWood	T Mulherin	<i>T Mulherin</i>	T Mulherin	<i>T Mulherin</i>	12/06/2014
5	N Buchanan / GWood	T Mulherin	<i>T Mulherin</i>	G Wood	<i>G Wood</i>	23/06/2014
6	N Buchanan / GWood	G McDiarmid		G Wood		07/11/2014

www.ghd.com

