



Darwin Bike Plan 2015 – 2020

Darwin Bike Plan

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Prepared for
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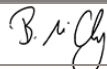

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Message from the Lord Mayor



The City of Darwin is proud to present the Darwin Bike Plan 2015 – 2020.

Here in the Top End, we make the most of outdoor life and we offer many of Australia's best outdoor activities including our extensive bicycle network.

Darwin has the highest participation rates in riding across all the Australian metropolitan centres. It is important that we build on what we already have and make our bicycle network one that will define the Territory and our unique lifestyle.

The Darwin Bike Plan complements and supports a range of other City of Darwin and Northern Territory Government plans, and sets out the priorities for bike riding in Darwin.

Through extensive planning and consultation we have developed a bike plan that aims to make Darwin recognisable for its safe, accessible and attractive bicycle network connecting our community and inviting everyday participation in bike riding.

To everyone who added their energy, wisdom and community knowledge to this plan, thank you.

Katrina Fong Lim

LORD MAYOR OF DARWIN

Executive Summary

Introduction

Background

Cardno has been commissioned by City of Darwin to develop a bike plan for the Municipality of Darwin.

The Bike Plan will be integral to the City of Darwin's and Northern Territory Government's strategies for catering for cyclists, at the present time and for the life of the plan (5 years). It will be a starting point for what then follows beyond five years. It will also refer, be referred to and coordinate with other City of Darwin and northern Territory Government policies including those for transport, tourism, recreation, planning and health.

Recent Projects

A number of cycling related projects have been undertaken in Darwin over the last couple of years. Key projects include:

- > Dinah Beach Road shared path (Stage 1)
- > Reconstruction of Nightcliff Road shared path
- > Construction of paths in Rapid Creek
- > Construction of shared path along Goyder Road
- > Reconstruction of shared paths along Gardens Road
- > Construction of shared paths along Abala Road
- > Reconstruction/resurfacing of sections of Dick Ward Drive shared path
- > Reconstruction of shared path in Bicentennial Park
- > New on-road bike lanes and shared path along Lee Point Road
- > Bike parking facility in Chinatown car park, and
- > Bike racks in a number of locations.

Structure of this Document

This document summarises the framework developed for the Darwin Bike Plan. The Bike Plan is based on an overall vision for bicycle riding in Darwin and is supported by four main objectives:

Vision: 'Darwin is recognised for its safe, accessible and attractive bicycle network that connects our community and invites everyday participation in bike riding'

Objectives of the Darwin Bike Plan are to:

1. Cultivate a considerate community culture that supports and participates in riding
2. Develop a co-ordinated and connected bicycle network
3. Deliver quality, safe and convenient infrastructure and facilities
4. Implement a 'Whole of Journey' approach to enable riding trips.

A series of actions have been identified in the Bike Plan to support each of these objectives. These are summarised in Section 2 below, with complete detail provided in the Bike Plan and the Implementation Plan.

Supporting Documentation

The Bike Plan has been developed on the basis of extensive research, surveys, and community and stakeholder consultation. The Bike Plan is founded on information contained in "Pedalling@theTop Darwin Bike Plan – Baseline Report" (June 2014). This document provides considerable background data, analysis and explanation to the intent and direction established by the Bike Plan.

The Bike Plan is supported by an Implementation Plan.

Baseline Documentation

The Baseline Report documents a comprehensive review of factors influencing bicycle riding in the Municipality of Darwin. Reflecting the holistic approach set out by the Australia National Cycling Strategy, this report considers:

- > integrated planning
- > network
- > infrastructure, facilities and safety
- > cycling promotion
- > monitoring and evaluation.

For each aspect, this report includes an outline of the current situation, future considerations, gaps in information and insights that have been highlighted during the background and initial consultation stages of the project.

The background information that has been reviewed for input into this Baseline Report includes:

- > Literature Review
- > planning framework
- > existing strategies, policies and plans
- > previous studies.

Mapping and Data Analysis

- > GIS mapping
- > ABS data
- > Crash information
- > Bicycle Counts.

Saddle Survey

- > Review of the infrastructure and safety characteristics of the existing cycling network.

Consultation

- > 5 stakeholder workshops during late January to early February 2014 with City of Darwin (CoD) and Northern Territory Government (NTG) representatives
- > 5 individual sessions with cycling groups in late January 2014
- > consultation with 9 community groups in July 2014 and
- > initial consultation survey for broader public input over January – February 2014.

Darwin Bike Plan –for Community Consultation

The Bike Plan was endorsed by the City of Darwin for widespread community and stakeholder consultation. The Bike Plan is based on the same structure as this document (with regard to the Vision and Objectives) and includes recommended actions.

Implementation Plan

The Implementation Plan for the Bike Plan documents the actions required for each objective. It is noted that a number of the actions will be outside Council's immediate control and will rely upon an ongoing working partnership between the City of Darwin, various Departments within the Northern Territory Government, private industry, bicycle groups and the community.

The Implementation Plan identifies those actions that rest in the control of Council, those that are delivered in partnership with the Northern Territory Government and other actions that will require Government agencies to implement (e.g. changes to the Northern Territory Planning Scheme for provision of end of trip facilities for riders, the setting and assessment of which is outside the powers of Council). In these instances, Council's role will be one of advocacy for change.

The Implementation Plan sets out recommended actions during the life of the Plan, with longer term actions and opportunities also included. The Implementation Plan includes consideration of ongoing monitoring and review of bicycle riding in Darwin.

Vision

'Darwin is recognised for its safe, accessible and attractive bicycle network that connects our community and invites everyday participation in bike riding'

Objective 1: Cultivate a considerate community culture that supports and participates in riding

Encouraging the take up of riding and increased participation by the community, as well as the development of a friendly, considerate and inviting attitude and culture towards riding has have been identified through the consultation processes. Two (2) key actions have been highlighted to support this objective:

- > Education campaigns: to support and promote messages such as Share the Road and Share the Path targeted at all users and to develop information regarding rider etiquette and appropriate conduct.
- > Promotion and encouragement: to deliver, primarily through existing activities, behaviour change techniques to normalise bike riding in Darwin.

The Bike Plan includes a set of projects and initiatives to support these actions, alongside a Behaviour Change Strategy, which focuses on incorporating cycling promotion within existing City of Darwin activities.

Objective 2: Develop a co-ordinated and connected bicycle network

The bicycle network should connect residents with where they want to go. Designated bicycle infrastructure should connect with the centres of activity identified for a community. Two (2) key actions have been highlighted to support this objective:

- > Strategic Network: A proposed future strategic bicycle network for Darwin has been developed taking into account the key trip attractors and generators within the City of Darwin, as well as the unique opportunities and constraints held by the city. In order to support the delivery of this bicycle network, a hierarchy of routes has been identified for Darwin
- > Integrated Planning: It is important to ensure bicycle riders are considered in the planning and design of new developments, particularly through the development approval process and existing communities through urban renewal projects and maintenance. Physical improvements, engineering initiatives and maintenance programs can also be cycle friendly by ensuring they are considered at the beginning of the process. The City of Darwin and the Northern Territory Government are currently in the process of developing a wide range of planning guidance documents and it is intended that the Bike Plan will reflect the strategic intent of these documents and that the vision and objectives of the Bike Plan can also be reflected within them.

The Bike Plan identifies the respective planning guidance documents which are under development as key opportunities to integrate planning for bike riding within a number of government planning processes. The Bike Plan also proposes that over time, the City of Darwin should develop its own (Darwin specific) requirements for bicycle facilities (and/or contribution to such) as part of development approval conditions.

Objective 3: Deliver quality, safe and convenient infrastructure and facilities

The infrastructure provided within the City of Darwin is primarily focussed on an off-road network, with the majority of cycling facilities provided by shared paths.

Through consultation processes, it was identified that this type of infrastructure is preferred by the majority of existing and potential bicycle riders and that maintenance of the paths is a particularly important consideration for riders. Through consultation with Council, a range of technical design issues were also raised for the provision and maintenance of cycling facilities.

Three (3) key actions have been highlighted to support this objective:

- > A proposed infrastructure framework has been developed to support the route hierarchy developed by Objective 2, with a continued preference for facilities separated from traffic where appropriate and space permitting
- > Recommendations for improvements in maintenance and infrastructure processes have been identified for consideration, several in partnership with the Northern Territory Government
- > An initial set of technical notes have been identified for development.

Objective 4: Implement a ‘Whole of Journey’ approach to enable riding trips

The whole of journey approach to riding refers to the resources and tools available from the moment a person decides to make a trip by bike, to when they park their bike and continue on to their destination. This ‘plan, trip and arrival’ framework was identified for the City of Darwin, and three (3) key actions have been highlighted to support this objective:

- > Plan: Mapping, available in printed form but also online, is extremely useful for new riders when planning their routes. The City of Darwin website was the ‘go to’ resource identified within the consultation survey process and the City should continue to build upon its online cycling resources
- > Trip: Through the saddle survey and consultation feedback, it has been noted that there is limited signage in place for the cycling network in the municipality of Darwin. Working with the Northern Territory Government, it has been recommended to develop a wayfinding and signage strategy for the municipality of Darwin
- > Arrival: Presently there are few bicycle parking facilities in Darwin and the consultation processes identified that there are concerns regarding bicycle security, as well as bicycle theft reported amongst riders. Therefore it has been proposed to increase the provision of bicycle parking within the CBD, at local centres and transport hubs, and work with stakeholders to promote the correct use of bicycle locks. A review of the operation, demand and satisfaction of users of the Chinatown Bike Pod has also been recommended.

Table of Contents

Message from the Lord Mayor	iii
Executive Summary	iv
Introduction	iv
Vision	vi
1 Context for the Bike Plan	1
1.1 Purpose of the Bike Plan	1
1.2 Background	1
1.3 Development of the Bike Plan	1
1.4 What the public told us about bike riding in Darwin	2
1.5 Key Themes	3
2 Strategic Framework	4
2.1 Vision	4
2.2 Objectives	4
2.3 Bike Riding Potential	4
2.4 Targets	7
2.5 Key Actions	8
2.6 Monitoring and Evaluation	8
3 Objective 1: Considerate Community	9
3.1 Current Situation	9
3.2 Key Actions	9
3.3 Proposed Approach	10
3.4 Funding Considerations	11
4 Objective 2: Connected Network	13
4.1 Current Situation	13
4.2 Strategic Bicycle Network	13
4.3 Integrated Planning	15
5 Objective 3: Quality Infrastructure	17
5.1 Current Situation	17
5.2 Infrastructure Framework	17
5.3 Other Infrastructure and Design Considerations	19
5.4 Maintenance	19
6 Objective 4: ‘Whole of Journey’ Approach	22
6.1 Current Situation	22
6.2 Proposed Approach	22
6.3 Trip and Arrival	23
6.4 Private Provision	26
6.5 City of Darwin Examples	28
7 Behaviour Change Strategy	29
7.1 Recommended Behaviour Change Approach and Activities	29
8 Prioritisation	34
8.1 Qualitative Scoring Process	34
8.2 Funding	35
8.3 Future Projects	35

9	Evaluation and Communication Processes	37
9.1	Existing Communication Processes	37
9.2	Existing Evaluation Processes	37
9.3	Proposed Evaluation and Communication Strategy for the Bike Plan	37

Tables

Table 1-1	Key Themes for the development of the Bike Plan	3
Table 2-1	Targets for the Bike Plan (City of Darwin Data)	7
Table 2-2	Targets for the Bike Plan (Data from Others)	7
Table 2-3	Objectives and Key Actions	8
Table 5-1	Facility Types	17
Table 5-2	Maintenance Review	20
Table 6-1	Whole of Journey Approach	23
Table 6-2	Framework for Public Facilities	24
Table 6-3	End-of-trip Requirements	26
Table 7-1	Behaviour Change Approach	29
Table 7-2	Proposed Actions and Suggested Activities	31
Table 8-1	Qualitative Prioritisation Factors	34
Table 9-1	Proposed Communication and Reporting Schedule	38

Figures

Figure 1-1	Inputs to the Bike Plan	1
Figure 2-1	Bicycle Network Rider Domains	5
Figure 2-2	Roger Geller's 4 Types of Cyclists (adapted by Bicycle Network)	6
Figure 2-3	Targeted Increase in Participation in Riding 2013 to 2019	7

Appendices

Appendix A	Bicycle Network Figures and Recommendations
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Acknowledgement

*Photos within the Darwin Bike Plan have been provided by the Northern Territory
Department of Transport*

1 Context for the Bike Plan

1.1 Purpose of the Bike Plan

The Darwin Bike Plan 2015 – 2020 has been developed to provide a framework for Darwin's provisions for bike riders over the coming five years. The Plan complements and supports a range of other City of Darwin and Northern Territory Government plans, strategies and policies, and sets out the priorities for bike riding in Darwin. An Implementation Plan with initiatives to support the vision and targets has also been developed as a separate document. The Implementation Plan will inform the operational plans and budget processes for the City of Darwin and Northern Territory Government. These relationships are illustrated in Figure 1-1.

1.2 Background

A range of important future planning processes are currently underway for Darwin, including the Darwin Regional Land Use Plan and Transport Plan, and Darwin City Centre Master Plan. Population growth is strong and expected to continue, a range of new activity centres are planned and a number of employment hubs are currently in development.

In recent years national, territory and local plans have highlighted the role of the bicycle within the local community, within the broader transport network and for personal health and wellbeing reasons.

As set out by the National Cycling Strategy for Australia, riding a bicycle benefits individuals and communities by:

- > saving time, especially on short trips (when travel time is measured from door to door, journeys up to 5 km are generally faster by bicycle)
- > improve personal health by increasing people's physical activity, and
- > improving air quality by reducing the carbon emissions from transport (currently responsible for 15% of Australia's carbon footprint and increasing).

As Darwin grows and plans its future transport network, providing for a range of travel choices, including by bike, will be integral to the strategic environment, social and economic goals of the community.

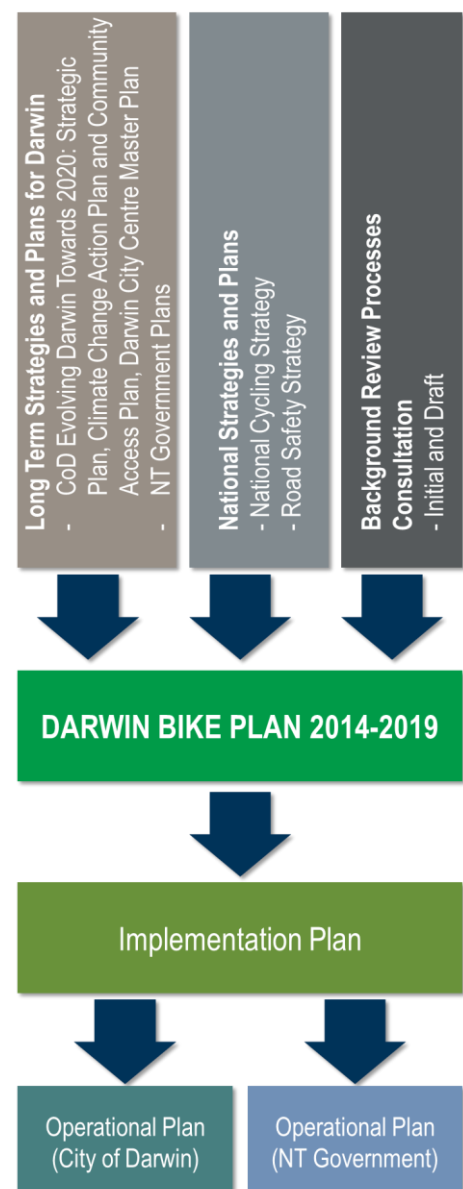
1.3 Development of the Bike Plan

A robust background review process has informed the development of the Bike Plan including:

- > Review of relevant planning, policies and strategies
- > Analysis of available ridership and travel information
- > Saddle survey of existing infrastructure
- > Several stakeholder workshops and meetings with focus groups including the Northern Territory Government, cycling interest and advocacy groups, major employers and
- > Initial Public Consultation via an online survey.

The findings of this background review and consultation process have been documented within a baseline report and have informed the development of this Bike Plan.

Figure 1-1 Inputs to the Bike Plan



1.4 What the public told us about bike riding in Darwin

City of Darwin has worked closely with the Darwin community to develop the Bike Plan. In late 2013, an online survey was undertaken of the community's views on bike riding, what Darwin does well, and where we can improve. Close to 1,000 surveys were completed, with 20% of respondents saying that they ride a bike less than once a week.

The survey respondents told us:

- > The most common purpose for bike riding was for recreational trips (reported by close to 90% of respondents who ride)
- > Trips by bike for transport purposes were most likely to be for shopping or visiting, while approximately half of the respondents commute to work by bike once a week
- > 70% of journeys by bike for shopping or visiting were local (within at least 5km)
- > Approximately half of bike commuters ride 10km or more and a similar proportion of fitness riders cycle 20km or more
- > While riding alone was the most popular way to travel by bike, recreational rides and those to the shops or visiting are more likely to be taken with friends and family
- > Routes separated from traffic, free of road and driveway crossings and in attractive settings were considered the 'best' for riding, and respondents specifically referenced Nightcliff, East Point, Casuarina Coastal Reserve and Lee Point. Stuart Highway and Howard Springs were also popular.
- > Bagot Road and the CBD were the top requests for new/improved cycling infrastructure
- > Conflict between riders and drivers was widely reported, particularly in regards to understanding the road rules, sharing the road and showing courtesy and respect
- > Existing riders showed a strong intent to increase the frequency of their trips by bike
- > The majority of existing riders and potential riders, preferred shared and exclusive bicycle paths over on-road bike lanes
- > 1 in 5 riders indicated that they had been involved in an accident while on their bike over the last year
- > 1 in 8 riders indicated that they had had their bike stolen in the last year. Half of those who identified where their bike had been stolen from explained that it had been taken from home
- > Those who indicated they were keen to start riding were more likely to be female than male, providing an opportunity to reduce the cycling gender gap
- > Potential new trips by bike were most likely to be recreational or local shopping or visiting trips.

The community was asked what they felt were the most important improvements for bike riding in Darwin, and their priorities were as follows:

1. Network and infrastructure development
2. Maintenance of existing infrastructure and facilities
3. Education and training for riders and other road users
4. Increased availability of end-of-trip facilities
5. Encouragement and promotion of bike riding.

These insights have helped to inform the Bike Plan's development, and feedback from survey respondents has been captured within this document. The Bike Plan sets out delivery of improvements to the networks and infrastructure for the City, ongoing maintenance activities, support for education and training programs, more end-of-trip facilities and promotion of bike riding.

"Darwin is relatively flat and ideal for cycling, it would be brilliant to see a real cycling culture here where as many as possible just got out on their bikes, for work, recreation and fitness."

Vision for Bike Riding in Darwin - Online Survey Respondent

1.5 Key Themes

Through the review and analysis for the baseline reporting and the initial consultation processes, a number of issues, opportunities and community priorities were identified. These key themes have informed the development of the Bike Plan and are summarised in Table 1-1.

Table 1-1 Key Themes for the development of the Bike Plan

Issues			
Coverage and Connectivity	Coherence and Legibility	Safety	Interaction between modes
<p>Ideally residential communities should be within a few minutes of designated cycling facilities. Alongside residential coverage, the bicycle network should connect residents with where they want to go (employment nodes, schools, parks, local shops and other community facilities). Analysis highlighted that there are areas of limited coverage and connectivity within:</p> <ul style="list-style-type: none"> the CBD and Northern suburbs. 	<p>The saddle survey found that:</p> <ul style="list-style-type: none"> crossing points and intersections required attention on most routes and introducing integrated wayfinding and signage would improve the experience of all users and modes greatly. <p>While cycling infrastructure is identified on key routes, the quality and continuity varies significantly due to existing access arrangements or spatial constraints.</p>	<p>While the overall trend for cycling crashes based on crash data is downward, 'hotspots' have been identified:</p> <ul style="list-style-type: none"> along Daly Street in the CBD along Progress Drive /Dick Ward Drive in Nightcliff and on the roads adjacent to Casuarina Square. <p>These locations represent complex intersection layouts and/or road sections with numerous driver/rider interactions within relatively short distances.</p>	<p>Through consultation processes, a number of issues were raised regarding behaviour and tensions between modes.</p> <p>Providing a network based primarily on shared paths has helped attract a higher proportion of the community to riding, however, it has limited exposure between road users to 'share the road'.</p> <p>Education for all road and path users has been highlighted as a particular issue for consideration within the Bike Plan.</p>

Opportunities			
Geographic Advantage	High levels of bicycle riding	Behaviour change programs in place	Community Support for Improved Facilities
<p>Darwin's coastal location, relatively flat topography and tropical weather provides for a pleasantly 'rideable' environment for most of the year.</p>	<p>Darwin has the highest participation rates in riding across all the Australian metropolitan centres.</p> <p>From City of Darwin's own community surveys, close to 50% of Darwin's residents have ridden a bike in the last year.</p> <p>Approximately 30% of the population ride once a week or more. Darwin holds the highest proportion of trips for both transport and recreational purposes – an excellent base to build upon.</p>	<p>From the initial review of the behaviour change activities within Darwin, the following framework appears to be in place:</p> <ul style="list-style-type: none"> City of Darwin implements Community Initiatives Northern Territory Government and City of Darwin implement school and workplace based initiatives. <p>It is likely that a coordinated approach could provide great benefits to the community, for example, having all bicycle related information (or links to) in one location online, or cross promotion of initiatives.</p>	<p>Through community satisfaction surveys carried out by City of Darwin, footpaths and cycleways regularly feature in the top priorities of community concerns for Darwin residents.</p> <p>The 2013 survey results suggest that there are opportunities to improve with residents giving maintenance of active transport infrastructure a 4.5 (out of 5) rating of importance, and a level of satisfaction of 3.6 (out of 5).</p>

2 Strategic Framework

2.1 Vision

The following vision for the Bike Plan has been informed through our consideration of the various inputs from stakeholders during the Bike Plan development process and aligns with City of Darwin's strategic objectives for Darwin:

'Darwin is celebrated for its safe, accessible and attractive bicycle network that connects our community and invites everyday participation in bike riding'

2.2 Objectives

Four primary objectives have been identified through the Bike Plan development process, in order to support this vision:

1. Cultivate a considerate community culture that supports and participates in riding
2. Develop a co-ordinated and connected bicycle network
3. Deliver quality, safe and convenient infrastructure and facilities
4. Implement a 'Whole of Journey' approach to enable riding trips.

These objectives have been used to identify actions, inform prioritisation and develop the supporting Implementation Plan for the Bike Plan.

2.3 Bike Riding Potential

2.3.1 Existing Riders

With the highest rates of cycling participation and commuting by bike of all Australian capital cities, Darwin has a strong record of riding. Review of recent bicycle survey data and census information has highlighted the following key considerations for Darwin's bicycle riding community:

- > close to 50% of Darwin's residents have ridden a bike in the last year
- > approximately 30% of the population ride once a week or more
- > 80% of trips by bike are for recreational purposes
- > close to 9% of bike trips were for transport purposes, which is higher than the national average (5%)
- > close to 5% of the working population commute by bike, which is the highest proportion of any Australian capital city and
- > commuting riders appear to continue riding at consistent levels during the Wet and Dry seasons.

Using Bicycle Network's Rider Domain framework (illustrated in Figure 2-1), these findings suggest that Darwin's bike trips are primarily for fitness and recreation purposes, with utility (or transport) related trips representing only a small proportion of bicycle journeys.

Figure 2-1 Bicycle Network Rider Domains



The results of the initial consultation survey identified recreational and fitness riding as the most popular trip purpose, by 9 out of 10 respondents. However, approximately 3 out of 4 respondents had also travelled by bike for transport purposes (to work, education, or local trips such as shopping or visiting).

There was much greater uptake in bike riding, and particularly transport related cycling trips, indicated by survey respondents compared with the above results from a broader Darwin population sample.

This suggests that Darwin's bike riding population represents a greater cross section of the Bicycle Networks Rider Domains, however is also likely to represent the bias in responses from this type of survey (i.e. likely to be completed by regular riders).

2.3.2 Potential Riders

The National Cycling Strategy sets out a desire to double participation in bike riding by 2016, while the City of Darwin Climate Change Action Plan 2020 identified a target of a 20% increase in walking, cycling and public transport to 2020.

Roger Geller's internationally recognised cycling segmentation philosophy is a best practice model for identifying potential bike riders. Geller proposed this cycling segmentation during his work with the City of Portland in Oregon, which has since been supported through surveys and adopted as a schematic model for the purposes of cycling development. This research suggests that approximately one third of individuals are unlikely to ride a bike for transport purposes, as illustrated in Figure 2.2. When this proportion is considered, alongside Darwin's high uptake in riding, doubling of participation rates overall is unlikely to be achieved. Therefore, it is instead proposed to focus on appealing to the 'interested but concerned' riders, who may not currently ride for transport purposes, but may already ride for recreational purposes.



Figure 2-2 Roger Geller's 4 Types of Cyclists (adapted by Bicycle Network)



As illustrated by Figure 2-2, the interested but concerned segment holds greatest potential for uptake in riding but will require the implementation of cycling infrastructure to feel safe and comfortable enough to start. The purpose of behaviour change activities for this group therefore is to encourage the development of an appreciation of the benefits, provision of the tools and culture of support for cycling while additional or upgraded infrastructure is designed and delivered.

However, it is important to recognise the need of the 'Enthusied and Confident' who prefer to ride within designated space on efficient routes, particularly for commuting trips. For those that are using a bicycle for transport over longer distances, fast and efficient trips are part of the reason they choose to leave their car at home.

2.4 Targets

The Darwin Bike Plan aims to enable everyday participation in bike riding, with an extra focus on encouraging and enabling trips by bike for transport purposes. Within our background review processes, we undertook a benchmarking process to understand where we are now and where we'd like to be in the future. Through this process it was identified that the existing City of Darwin Community Participation Survey captured data which could be used to report annual progress of the Bike Plan.

Aligning with the 2013 results of the City of Darwin Community Survey, the targets outlined in Table 2-1 are proposed for the Bike Plan, with the suggested increases in participation included in Figure 2-3.

Table 2-1 Targets for the Bike Plan (City of Darwin Data)

Where are we now?	In 2019 we will achieve:	Policy Reference (if applicable)
57% never ride a bike	55% riding a bike (20% reduction in those who have 'never' ridden a bike)	City of Darwin Climate Change Action Plan 2020
30% ride a bike at least once per week	36% ride a bike at least once a week (20% increase)	City of Darwin Climate Change Action Plan 2020
3.6 out of 5 for satisfaction with footpath and bikeways	4 out of 5	

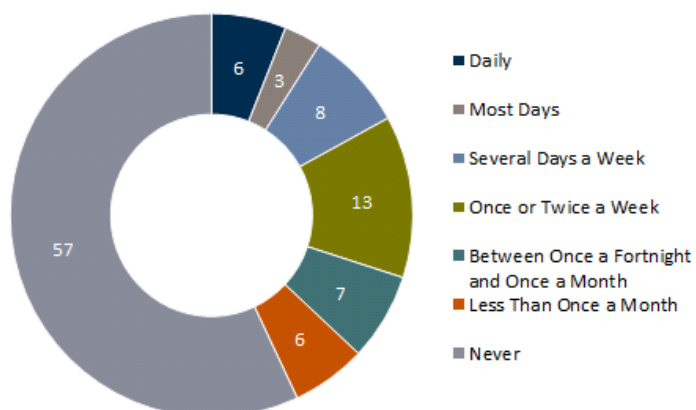
Additional questions within the Community Consultation Survey regarding the purpose of bicycle trips (particularly commuting by bike), as well as a question to measure attitudes toward bicycle riding, would also be of value to align with the objectives of the Bike Plan. Alternatively (or additionally) the trip purpose question from the Cycling Participation Survey run biannually by the Australian Bicycle Council, ABS Census data and accident data could be used for benchmarking as included in Table 2-2.

Table 2-2 Targets for the Bike Plan (Data from Others)

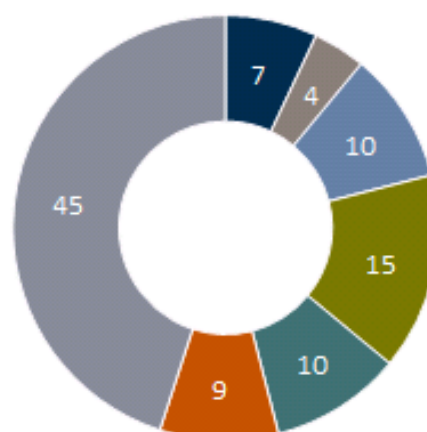
Where are we now?	In 2019 we will achieve:	Policy Reference (if applicable)
Close to 9% of bike trips are for transport purposes	18% of bike trips are for transport purposes	National Cycling Strategy 2016
4.1% of commuters ride to work (2011)	5% of commuters ride to work (2016 – 20% increase)	City of Darwin Climate Change Action Plan 2020
Between 2008 – 2012 there were 148 bicycle related crashes reported	Ongoing reduction in the number of bicycle crashes reported in Darwin	

Figure 2-3 Targeted Increase in Participation in Riding 2013 to 2019

Community Participation in Bike Riding (CoD 2013)



2019 Targets



2.5 Key Actions

To achieve these objectives, key actions have been identified. These actions will direct the Implementation Plan for the Bike Plan, and be supported by the strategies for behaviour change, monitoring and evaluation and communication (see Table 2-3).

Table 2-3 Objectives and Key Actions

Objective and Actions	
OBJECTIVE 1: Cultivate a considerate community culture that supports and participates in riding	
Education Campaigns	Undertake initiatives to support and promote messages such as Share the Road and Share the Path targeted at all users Develop information regarding rider etiquette and code of conduct
Promotion and Encouragement	Deliver an ongoing communication strategy to increase engagement with the wider community in riding. This should be undertaken in consideration of community awareness campaigns with other partners such as the Cycling Alliance, Amy Gillett Foundation and Tourism NT Use of behavior change techniques to normalise riding – include in existing events and promotional activities and identify further opportunities
OBJECTIVE 2: Develop a coordinated and connected bicycle network	
Fill the Gaps: <ul style="list-style-type: none"> Reconnect the CBD Centres to Suburbs Local Access 	Identify opportunities: <ul style="list-style-type: none"> to integrate the CBD with the broader bicycle network to improve connections by bike between the CBD and Casuarina, and advocate for enhancements for Bagot and Trower Road (Northern Territory Government control) for connections by bike to local centres
Integration	Identify opportunities to include consideration of bicycles within all stages of planning and design
OBJECTIVE 3: Deliver quality, safe and convenient infrastructure and facilities	
Infrastructure, Accessibility and Safety	Identify improvements to the existing infrastructure and facilities, and the needs of the proposed network Investigate crash hotspots for riders and identify initial opportunities to address Ensure facilities are designed to cater for all users, in particular those with mobility impairments and incorporate Crime Prevention Through Environmental Design (CEPTED) principles
Technical notes	Develop a set of technical notes and guidance for Darwin regarding bicycle infrastructure
OBJECTIVE 4: Implement a 'Whole of Journey' approach to enable riding trips	
Information Provision	Identify tools to assist new and existing riders to plan trips by bike
Mid and End of Journey	Develop an approach to mid and end-of-trip facilities to guide and support bicycle riders while on their trip and when they reach their destination. This includes improving end-of-trip facilities, bike parking in the CBD and mid-trip facilities such as water fountains, bicycle pumps etc.

Further discussion and details of the actions for each of the above four objectives are provided in Sections 3, 4, 5 and 6.

2.6 Monitoring and Evaluation

Integral to the Bike Plan is a robust monitoring and evaluation process. A proposed monitoring and evaluation plan for the Bike Plan is set out in Section 9. This plan is based upon the existing evaluation processes undertaken by the City of Darwin and Northern Territory Government. Specific monitoring and evaluation for particular projects will also be undertaken. Details regarding these considerations are included in Section 9.

3 Objective 1: Considerate Community

3.1 Current Situation

Through the consultation processes, a number of issues were raised regarding behaviour and tensions between modes of transport. For pedestrians, bike riders going too fast on shared paths was an issue, while for drivers, bike riders 'jumping' red lights and taking a full lane was causing frustration.

A number of bicycle riders spoke of their apprehension when riding on-road, without dedicated facilities. However, they also recognised they were riding too fast for the shared paths, or felt that they were safer on the road than alongside frequent driveways. For those that are using a bicycle for transport over longer distances, fast and efficient trips are part of the reason they choose to leave their car at home. These types of trips are not well catered for within the existing shared path network and riders therefore use the roads and mix with traffic.

Providing a network based primarily on shared paths has helped to attract a higher proportion of the community to riding. However, it has limited exposure between road users to 'share the road'. Through the public consultation survey, this sentiment was highlighted as respondents were least likely to agree that "Bicycle riders, drivers and pedestrians interact positively within Darwin's transport network", scoring this on average 2.6 out of 5 (Disagree).

In addition, feedback from stakeholders indicates the increased and ongoing usage of Segways and electric bikes on the shared path network, increasing future potential conflict between pedestrians, bicycle riders, Segways and electric bikes.

"Families to be able to ride together safely e.g. to beach, markets, shops. Darwin is perfect city for cycling. Beautiful scenery & flat roads - perfect (just a tad hot in build up!). Education campaign for drivers to get used to sharing the road with cyclists. Educate cyclist to stick to road rules too"

Vision for Bike Riding in Darwin - Online Survey Respondent

3.2 Key Actions

Encouraging the take up of riding and increased participation by the community, as well as the development of a friendly, considerate and inviting attitude and culture towards riding have been identified through the consultation processes. Also highlighted was the need to encourage responsible bike riding behaviours.

Two (2) key actions have been highlighted to support this objective:

- > Education Campaigns: to support and promote messages such as Share the Road and Share the Path targeted at all users and to develop information regarding rider etiquette and appropriate conduct. Education is an important factor in ensuring safe use of facilities by pedestrians, cyclists and other groups (such as Segway users), including motor vehicle drivers. Behaviour of users can be affected by programs which target enforcement and public education. There is a need to educate users of the transport network including pedestrians, cyclists and drivers on how to safely use the network and be aware of each other's needs. Education and information are also vital to encouraging the community to cycle
- > Promotion and encouragement: to deliver, primarily through existing activities, behaviour change techniques to normalise bike riding in Darwin. Encouragement strategies can make a significant difference to increasing walking and cycling in the City. Promotion of the City of Darwin bicycle facilities and encouraging their use is vital to promoting the range of services and the liveability of the City. It can also increase opportunities to encourage increased tourism in the City.

3.3 Proposed Approach

The following projects and initiatives have been developed in order to achieve this objective:

Actions	Description
<p>Share the Path Etiquette</p> <ul style="list-style-type: none"> Maintenance and expansion of shared path stenciling and line marking Working with Northern Territory Government to develop coordinated wayfinding and signage approach for Darwin Development of a 'Share the Path' campaign with Northern Territory Government Development of a Code of Conduct for Shared Paths with Northern Territory Government 	<p>Development of signage and a supporting educational campaign regarding user behavior on shared paths should be actioned as a high priority.</p> <p>Austrroads commissioned ARRB to undertake a research project on this issue, including a review of the many existing codes of conduct in place for shared paths. The findings emphasised an integrated approach to shared path provision from planning to maintenance. Key recommendations were to encourage users to keep left, the use of centre-line marking and keep left (or similar) stencils, complementing pathway signage requirements as set out by Austrroads.</p>
	 <p>For existing facilities, such infrastructure and maintenance activities should be supported by educational campaigns. Based upon feedback from the community about locations of conflict, the recreational paths could be used as a pilot for this campaign (i.e. Nightcliff or East Point shared paths). An example of the type of campaign that could be developed includes City of Sydney's Bell It, Share It, Slow It message. The City's Share the Path team travels to different locations near shared paths in the morning and evening to provide safety advice, free tune-ups and free bells. Friendly information experts answer questions on cycling and using shared paths. In 2013, 164 Share the Path sessions were held at key locations around the city. Bike mechanics provided free tune ups for 1,032 riders and 1,579 free bells were fitted to riders' bikes.</p> <p>It is understood that Northern Territory Government is planning to undertake a wayfinding and signage study in order to develop a set of guidelines for their cycling infrastructure. Reflecting a one network approach, City of Darwin is intended to be a key stakeholder within this project. This will ensure a coherent and coordinated outcome for users of the paths, and also ensure the outcomes of the City of Darwin's Community Access Plan 2012-2017 are reflected within the Strategy's development.</p>
<p>Share the Road Campaign</p> <ul style="list-style-type: none"> Increase the use of 'Share the Road' signage throughout Darwin Work with Northern Territory Government to increase awareness of the requirements set out in the Road User's Handbook for all road users 	<p>The Northern Territory Government now includes a section on bike riders within its Road Users Handbook, which is a useful tool for those currently learning to drive. From discussions with stakeholders, there appeared to be particular concerns from existing drivers and bicycle riders regarding sharing the road with each other.</p> <p>From the driver's perspective, there was frustration with bike riders' jumping' red lights, and from bike riders, drivers being aggressive when sharing the road with riders.</p> <p>The development of an educational campaign targeted at these particular undesirable behaviours from both modes is proposed for development for Darwin, delivered in partnership with City of Darwin and the Northern Territory Government. Support and involvement from the Northern Territory Police would also be suggested for this campaign.</p>
<p>Fostering abilities and awareness of safer bike riding - Parap Road Safety Centre</p>	<p>Northern Territory Government provides the Parap Road Safety Centre to teach primary school aged children about road safety, primarily during school hours. These facilities are also available outside school hours and the Northern Territory Government provides training for other groups via the Centre.</p> <p>City of Darwin should continue to promote the availability of this invaluable facility to its residents, and pursue opportunities to support bicycle training, increasing uptake in formal courses and informal use of the Centre in conjunction with the Northern Territory Government.</p>

Actions	Description
'Ride to the Markets' promotional and education campaign	<p>Promotion of riding to the ever popular, iconic markets in Darwin – Nightcliff, Parap, Rapid Creek and Mindil Beach. This initiative could include temporary bike stands, information on riding to the markets on associated websites and potential for bike maintenance workshops (Doctor Bike) near arrival points. Opportunities for rides led by the City of Darwin, or in co-ordination with existing bicycle riding groups could also be explored.</p> <p>The 'Ride to the Markets' initiative would have to be organised in consultation with the market organisers.</p>
Behaviour Change Strategy and a Darwin 'BikeFest' Event	Additional opportunities to raise awareness and educate the community on bicycle riding have been identified within the behaviour change strategy (see Section 7).

“That all cyclists will be able to ride on roads & shared pathways safely; to whichever destination they are headed, knowing all motorists are comfortable with and willing to share the road.”

Vision for Bike Riding in Darwin - Online Survey Respondent



3.4 Funding Considerations

While funding for educational and promotional campaigns is recommended for inclusion within the Implementation Plan for the Bike Plan, it is recognised that limited funding is available to undertake education and promotional projects.

Funding for the Healthy Darwin program ceased from the 30 June 2014 and as a result there is no budget for future delivery of cycling promotion activities. City of Darwin has advised that only a minor number of led rides would be achievable without additional funding. Currently two beginner Sunday rides are supported weekly (Parap and Wulagi).

Therefore, reflecting the partnership approach set out for this objective, it is recommended that the City of Darwin undertake ongoing review of all projects identified and consider whether:

- > there are opportunities for funding from other sources and
- > the initiative can be integrated into the delivery of another project (e.g. TravelSmart, other physical activity and health community, workplace or school programmes, etc.)

These reviews should be undertaken in co-ordination with delivery partners such as the Northern Territory Government.

4 Objective 2: Connected Network

4.1 Current Situation

The bicycle network should connect residents with where they want to go. Designated bicycle infrastructure should connect with the centres of activity identified for a community. Existing schools, parks, local shops and other community facilities also play an essential role within the development of a bicycle network, encouraging local trips by bike.

In order to understand the existing effectiveness of the bicycle network, a review of residential and employment densities was completed, alongside other key nodes of activity. The Darwin community is relatively well serviced by the existing bicycle network, with the majority of residents within 400 metres of a designated bicycle route. However, challenges for the network were also identified, including the severance and increased travel distances created by the Airport. The analysis highlighted gaps in connections within the CBD and local facilities, particularly in the suburbs to the north and north-east of Darwin such as Wulagi, Karama and Malak.

Through the consultation processes, these technical findings were echoed, with connections into the CBD, local centres, schools and recreational locations highlighted through the online survey and the key stakeholder meetings and workshops.

“Link up and expand the current bike path network particularly in and around the CBD. Link up the main tourist spots of the Waterfront, Esplanade, Cullen Bay, Botanic Gardens, Mindil Beach and Parap Markets. Build a new path along Bagot Road on the airport side with a feeder network from the northern suburbs to encourage commuters.”

Vision for Bike Riding in Darwin - Online Survey Respondent

4.2 Strategic Bicycle Network

The proposed future strategic bicycle network for Darwin has been developed taking into account the key trip attractors and generators within the City of Darwin (as shown in Figure 1 in Appendix A), as well as the unique opportunities and constraints held by the City.

The framework used for the development of Darwin Bicycle Network is based upon:

- > Austroads elements of safety, coherence, directness, comfort and attractiveness and
- > Bicycle network criteria of connectivity, permeability and quality.

4.2.1 Proposed Hierarchy

A comprehensive future strategic bicycle network has been developed for Darwin, indicated by Figure 2 in Appendix A. Regional routes will link major destination points including recreational areas, and regional and urban routes will connect residential areas.

Urban and neighbourhood routes make up the core of the network, providing safe and direct links to local centres, parks and schools. New and upgraded pedestrian and cycling only connections are proposed to connect to and be provided within green spaces and laneways – providing convenient and direct access for riders and other active transport users to local facilities and activity centres.

In line with these considerations, the following hierarchy has been developed for the routes provided, reflecting the role in the network and the types of riders targeted for use:

- > Regional Routes
- > Urban Routes
- > Recreational Routes and
- > Neighbourhood Routes.

Alongside these routes for access, places for people to dwell and enjoy the space are important in order to add to the social development and amenity of urban environments. To support this, a pedestrian priority zone has been identified within Darwin's CBD, The Mall.

It is proposed that Darwin's bicycle network adopts the hierarchy and connectivity principles described below.

4.2.2 Regional Routes

These routes connect Darwin to the key external activity centre of Palmerston, alongside the existing regional centres of Darwin and Casuarina, and other centres of regional importance including the Airport and Charles Darwin National Park.

These principal bicycle routes run primarily alongside the higher order road network, providing convenient and direct connectivity for longer distance bicycle riders. However these regional routes will also integrate with the rest of the network, and are intended to be used by a wide variety of riders.

Regional Routes have been proposed for extension and connection into the CBD in order to reconnect the City by bike.

4.2.3 Urban Routes

Urban routes will link the key activity centres (including recreation activity nodes) and provide access to the regional and neighbourhood routes. Urban routes complement the regional routes within the CBD, providing direct access to key nodes of activity within the City Centre. This network connects with:

- > Specialty Activity Centres of Charles Darwin University, Royal Darwin Public and Private Hospitals, Airport Business Park and Homemaker Centre
- > Neighbourhood Activity Centres of Parap Village, Nightcliff Shopping Centre, Northlakes Shopping Centre, Karama Shopping Centre and Rapid Creek Shopping Centre.

Particular consideration, in line with the direction of the Greater Darwin Regional Plan, has been suggested for the growth of Parap Village, Nightcliff, Karama and Berrimah. Urban routes have been proposed to support these urban areas. Additional employment and residential development that is currently underway, and has been considered within the urban route network includes:

- > Zone Darwin (CBD)
- > Darwin City Gate (CBD)
- > The Avenue (Parap) and
- > Berrimah Business Park/Darwin Corporate Park.

4.2.4 Recreational Routes

These routes are designed to connect with a recreational destination, such as local beaches and reserves. It should be noted that a number of urban routes (connecting key centres) travel through recreational areas, but their primary purpose is not considered 'recreational'. Recreational facilities are provided in locations of high community value and amenity, with limited interaction with traffic and provide 'low stress' routes for recreational riding for a wide range of users.

It should be noted that off road trails and longer distance recreational routes (for touring or training rides) have not been the focus for this Bike Plan; however connections to these facilities and routes have been considered. Note that the implementation of any routes/paths through the Casuarina Coastal Reserve (or similar parks) is subject to consultation with the parks wildlife department.

4.2.5 Neighbourhood Routes

These routes are designed to connect neighbourhoods with their local centres, particularly schools, in order to encourage local trips to be made by walking and cycling. Routes are designed for less confident or occasional riders, including children. These facilities are based on a grid pattern where possible, making use of the community green space, low speed, low volume streets and existing laneways to connect neighbourhoods, transport nodes and local centres in order to provide 'low stress' routes for riding to local activity centres.

Within the Bike Plan, these routes have been focussed on 'filling' the identified gaps in the existing network coverage for the northern suburbs, Anula, Wulagi and Malak.

4.2.6 Local Access

The lowest order of streets are designed to provide for active transport modes through integrated street design, with many incorporating shared carriageways, low speed environments and an urban design that supports these uses. These streets form part of the network of local routes. These local routes have not been mapped. However, it is intended that they provide the fine grain access for active transport modes and play an important role in the network – being the start or end point for the majority of trips.

“An extensive, linked system of bike paths, including exclusive bike paths, that make cycling convenient and safe, and a large proportion of the population choosing this as an everyday option.”
Vision for Bike Riding in Darwin - Online Survey Respondent

4.3 Integrated Planning

In order to develop a cost effective pedestrian and cycle network, planning needs to be incorporated into all of the City of Darwin's existing planning and processes. This should include integration within planning and development assessment processes, for both land use and transport.

It is important to ensure bicycle riders are considered in the planning and design of new developments, particularly through the development approval process and existing communities through urban renewal projects and maintenance. Physical improvements, engineering initiatives and maintenance programs can also be cycle friendly by ensuring they are considered at the beginning of the process.

The City of Darwin and the Northern Territory Government are currently in the process of developing a wide range of planning guidance documents including:

- > City of Darwin - Darwin City Centre Master Plan
- > City of Darwin Community Wellbeing Plan
- > City of Darwin Asset Management Plan
- > Department of Transport (DoT) Darwin Transport Plan
- > Department of Transport (DoT) Northern Territory Public Transport Strategy
- > Department of Transport (DoT) Integrated Transport and Investment Roadmap
- > Department of Planning, Land and Environment Darwin Regional Land Use Plan and the
- > Department of Health (DoH) Physical Activity and Nutrition Strategy.

The development of these strategic documents is a key opportunity to integrate planning for bike riding within a number of government planning processes. It is intended that the Bike Plan reflect the strategic intent of these documents and that the vision and objectives of the Bike Plan can also be reflected within them. Ensuring that bicycle routes connect with public transport hubs is a particular consideration for the integration of the future network.

At a local level, the provision of the Bike Plan can be more cost effective if integrated with road network planning, maintenance and construction. A simple example of this is when the City of Darwin undertakes road resealing works, provision for bike riders can be provided on the road when the City of Darwin undertakes the new line marking. This results in minimal additional costs to the City of Darwin but allows cycling facilities to be provided. Similarly when the City of Darwin is undertaking new road construction, bicycle facilities can be incorporated when detailed planning and construction occurs also resulting in cost efficiencies.

It is understood that The City of Darwin applies Austroads guidance when reviewing (for example as part of a development application) or designing the provision of new infrastructure whenever possible. As an initial step, the Austroads guide should be used as a reference for inclusion within development conditions (e.g. provide cycle facilities in accordance with Austroads). Over time, the City of Darwin should develop its own (Darwin specific) requirements for cycle facilities (and/or contribution to such) as part of development approval conditions.

A practical consideration for development planning processes for the municipality of Darwin is to work with the Northern Territory Government towards controlling and consolidating access points along the higher order bicycle routes. This will help reduce the number of potential conflicts and interruptions faced by users in the longer term.



5 Objective 3: Quality Infrastructure

5.1 Current Situation

The infrastructure provided within the City of Darwin is primarily focussed on an off-road network, with the majority of cycling facilities provided by shared paths. This type of infrastructure is preferred by the majority of existing, and potential riders. However, the challenges summarised by the existing infrastructure are as follows:

- > For many users at present, while the shared path network is located on higher order roads, these roads include numerous driveways and minor intersections that cross the cycle path (such as Bagot Road, which is intended to provide for regional cycling trips). The form of these paths, with numerous crossing points, results in an interrupted journey, requiring frequent stops, with the inherent risk of conflicts at driveways
- > Opportunities to retrofit on-road facilities appear to be limited due to available on-road space and, while reducing the number of access points along the routes can be achieved through planning regulation in the long term, in the interim, only superficial and minor improvements are likely
- > The reallocation of carriageway space and parking lanes to provide for improvements to cycling facilities has held limited support historically; nevertheless, removal of parking lanes to provide for cycling infrastructure needs to be considered and investigated
- > Interim focus to be on improving safety and sightlines wherever possible within the constraints of existing infrastructure and a focus on the provision of appropriate crossing points.

5.2 Infrastructure Framework

As a result of the development of the hierarchy of routes, proposed facility types have also been recommended and have been reflected within the Implementation Plan. The general theory behind decisions for facility types proposed to support the future network has been based on the methodology and infrastructure definitions set out in Austroads. It is intended that the infrastructure developed and delivered within the City of Darwin will continue to be in accordance with Austroads. These infrastructure definitions are set out in Table 5-1.

Table 5-1 Facility Types

Facility	Details
Footpaths	General minimum width of 1.2m is adequate for most residential street locations, however they should be wider to cater for demand within local centres and commercial precincts. It should be noted that bicycle riders are permitted to use footpaths in the Northern Territory.
Off-Road Cycle Facilities	Exclusive bicycle paths, separated paths (i.e. bicycle and pedestrian) and shared use paths. Shared paths to be shared by walkers, bicycle riders, wheelchairs and wheeled recreation devices. Design should therefore take into consideration geometry for cyclists and for people with disabilities (i.e. curve radii, sight distance).
On-Road Cycle Facilities	There are a number of on road facilities that can be considered for on-road cycling including dedicated unprotected bike lanes, contraflow bicycle lanes, protected bicycle lanes, wide sealed shoulders, advisory treatments and wide kerbside traffic lanes. Detailed design of these facilities will determine the appropriate type, taking into consideration road reserve and pavement widths. Facilities which provide dedicated space for riders (e.g. bicycle lanes) are the preferred treatment wherever possible.
Bicycle Advisory Pavement Markings	Advisory treatments are used to indicate or advise road users of the potential presence of cyclists and the location where cyclists may be expected to ride on a road. They use pavement markings, warning signs or guide signs, and as such have no regulatory function. The purpose of these treatments is usually to define a bicycle route rather than a type of facility to which specific road rules apply.

It should be noted that as detailed investigations and design progress, more appropriate facility types may be proposed along particular routes.

5.2.1 Regional Routes

Infrastructure for regional routes should provide a continuous path for bicycle riders, with interruptions to riding minimised. The desired infrastructure provisions for regional routes include:

- > Shared paths (3m minimum width) provided alongside higher order roads or within reserves, with minimal driveway and minor intersection interruptions
- > Along these routes, intersection controls are likely to be provided by traffic signals. Provision of cycle crossing at signalised intersections must be facilitated through bicycle lanterns, and this is a particular consideration for the regional routes. No bicycle lanterns are currently provided within the City of Darwin
- > Clear priority crossing treatments provided for minor side streets (subject to design investigations).

Where demands and conflicts between pedestrian and bicycle riders are high and shared paths are unsuitable, or where driveways and intersections are frequent and priority cannot be established, other provisions may be considered wherever space and/or funding permits, including:

- > Separated bicycle facilities or
- > On-road bicycle lanes.

5.2.2 Urban and Recreational Routes

Infrastructure design for urban and recreational routes should also provide a continuous path for bicycle riders, with interruptions to riding minimised. The following infrastructure provisions are recommended:

- > Shared paths (2.5m minimum, 3m desired width*) commuter on-road provisions considered (particularly where providing an alternative to on-road riding on a busy road)
- > Provision of cycle crossings at signalised intersections.

*High use paths (particularly high mix of pedestrians and riders such as popular recreational paths, or where urban and recreational routes mix) – additional width, or separation of modes is recommended.

5.2.3 Neighbourhood Routes

While the existing shared path network circles most Darwin suburbs, designated routes into suburbs are limited. In most cases, these suburbs are well formed, and retrofitting dedicated cycling infrastructure is likely to be a costly and potentially unnecessary process.

However, less confident bike riders, including school students, will not be comfortable riding on a normal street with vehicle speeds in the vicinity of 50km/h or higher. Therefore there is a need to develop a middle solution suitable for both less confident and more confident bike riders and to consider alternative approaches for provision of routes within Darwin's neighbourhoods.

Through a desktop review of various land uses within the suburbs of Darwin and workshop sessions with stakeholders, potential opportunities have been identified to make use of the following to develop neighbourhood access routes or 'greenways', connecting communities with local facilities:

- > Northern Territory Government held land (such as local schools)
- > City of Darwin's open space network (including parks and laneways)
- > quiet residential streets and
- > road reserves where available.

The neighbourhood greenway, alternatively known as 'bicycle boulevard', is the name given to a range of treatments to quiet suburban streets in order to create a safe, low speed and low traffic environment for on-street cycling. The main purpose of these neighbourhood routes is to create an environment that encourages on-street cycling (where required) among riders of all confidence levels. With a safer, friendly environment for bike riders, it is expected that greenways will encourage greater uptake and use of bicycle riding as a transport mode for students, commuters and everyday travel.

Consideration of the following features may be included when developing a neighbourhood route, and implemented as/when appropriate:

- > Shared paths between road sections
- > Pavement markings such as bicycle symbols which guide riders on their positioning and remind motorists of the presence of bike riders
- > Improved crossings at busy roads (e.g. refuge islands)
- > Speed limit reductions
- > Reversal of priorities at minor intersections to give the bike riders priority (e.g. relocation of give way line markings) and
- > Road closures and traffic calming devices to reduce traffic volumes.

5.2.4 Local Access

These connections provide fine grain access – provided by footpaths, and/or low volume low speed local streets. In general, no specific provisions for cycling need to be implemented as bicycles simply share space with other users (at low speed and low volume).

5.3 Other Infrastructure and Design Considerations

As identified through the consultation and background review processes, bicycle riders are particularly vulnerable at intersections as there is more potential for conflicts, and safety at these locations should be a priority. Austroads Parts 13 and 14 provide standards for treatment of pedestrians and cyclists at intersections. Austroads also notes that roundabouts, particularly those with more than one circulating lane are markedly less safe for cyclists than for other road users. It is preferable to avoid building roundabouts with more than one lane wherever possible. If this cannot be avoided, convenient alternative routes for pedestrians and cyclists must be provided.

City of Darwin places importance on supporting an active and mobile community through its infrastructure provision. The Disability Discrimination Act (DDA) and Australian Standards (AS1428) provide principles and guidelines to ensure facilities are provided to meet the needs of people with disabilities, and the intent of Universal Design is to create environments to be usable by all people, to the greatest extent possible. These principles and supporting guidance should be incorporated throughout the design development processes.

Crime Prevention Through Environmental Design (CPTED) is another set of design principles which aims to create an environment which minimises the opportunities for crime to occur. CPTED aims to create a physical environment that can reduce the incidence and fear of crime, particular considerations for off-road shared paths within road reserve areas or green spaces. CPTED principles should be considered within infrastructure design processes.

5.4 Maintenance

Regular maintenance is required to keep cycling facilities in a reasonable condition. Bicycle riders are particularly vulnerable to punctures and crashes caused by broken glass, loose gravel and vegetation. Regular maintenance should address these activities, as well as ensuring infrastructure is provided to a relatively consistent level of quality.

It is noted that the findings of the saddle survey were considered and used to inform the Bike Plan and maintenance program (which is separate to the Bike Plan). The City of Darwin plans to incorporate the findings of the Saddle Survey into their regular maintenance program. However, the detailed outputs from the Saddle Survey will not be included in the Bike Plan and associated documentation.

The bike paths observed in the municipality of Darwin during the saddle survey for the Bike Plan were generally of good quality and well maintained. However, through the background review and consultation processes, the following key maintenance issues were raised for improvement by individuals and user groups:

- > Sweeping of the paths for debris particularly glass
- > The importance of a smooth surface for riding and
- > The upkeep of the shoulders of roads.

The existing frequency of City of Darwin and Northern Territory Government maintenance activities plus opportunities for improvements reflecting feedback from consultation are set out in Table 5-2 below.

Table 5-2 Maintenance Review

Activity	City of Darwin	Northern Territory Government	Findings
Regular sweeping of paths to remove gravel, sand/earth, broken glass and vegetation, including targeted sweeping of known problem areas – e.g. paths through parks after a Saturday night	Paths swept every 15 days. There are locations on the network that require specific maintenance, for example Dick Ward Drive is swept weekly during October – December due to the impact of the seasons and the leaf and seed drop onto the shared path.	Path sweeping schedule: Most paths are swept weekly, with some fortnightly. Paths are also swept when required (as identified by users).	User feedback suggests more frequent sweeping would increase satisfaction levels. A record and review of common complaints should be undertaken annually in order to identify locations where more frequent sweeping may be required.
Prompt cleanup from storms, fires and other one-off events which cause damage to paths	Included in City of Darwin's usual maintenance and response duties following these one-off events. The City of Darwin is currently developing a mobile app to report minor maintenance issues such as debris, broken glass, overhanging branches etc.	DoT's online 'report a fault' system is promoted for users to identify path maintenance issues http://www.transport.nt.gov.au/travelsmart/cycling/report-a-fault - this facility is well used for minor maintenance issues such as debris, broken glass, overhanging branches etc. and DoI responds promptly to issues raised	Positive feedback in the improved response from these types of one-off events was noted from users.
Regular pruning of vegetation to ensure the full path width is available	Trees along the routes are pruned every 2 years.	Trimming of vegetation is undertaken by landscape contractors who are guided by key contract performance indicators.	Consideration of the location, maintenance requirements and types of landscaping and trees alongside cycling facilities
A regular, documented system of visual path inspections to identify surface or structural defects.	The conditions of all City of Darwin paths are reviewed on a 4 yearly rolling basis (i.e. once every 4 years paths are reviewed, however the review is ongoing).	Path inspections are undertaken weekly, although where there are known issues, inspections are more frequent. 5 yearly annual cycle path network reviews identify and prioritise maintenance actions – the review actions form the basis for the ongoing maintenance program	Integration of the City of Darwin and Northern Territory Government path review processes could be advantageous to ensure that defects are identified and recorded consistently in order to maintain smooth riding surfaces for users.

The quality of sealed shoulders should be provided and maintained by both Northern Territory Government and City of Darwin through their ongoing road maintenance and sweeping activities.

“A more complete network of paths that are high quality and are regularly maintained”

Vision for Bike Riding in Darwin - Online Survey Respondent

Supporting Actions – recommended to be undertaken during the life of the Plan:

Undertake a review of the reported maintenance issues annually in order to identify any recurring issues that can be integrated within the regular maintenance activities

To support the development of this infrastructure, a set of technical notes have been identified for development to be provided as an attachment or future addendum to this Plan. Additional technical notes may also be identified for development through the duration of the Bike Plan as needed. Technical notes identified to date include:

- Crossing treatments for shared paths
- Line marking and surface treatments (i.e. green surfaces across intersections) for shared paths and on-road facilities
- Location and requirements for handrails
- Connections from shared paths to on-road facilities (including walkways)
- Constructed materials (i.e. which type of riding surface is best on-road vs off-road)
- Consideration of maintenance vehicles on shared paths
- Cycling and high speed roads
- Kerb ramp design
- Timing for construction of paths in newly developed areas

Review of 20km/h speed limits on City of Darwin shared paths

Consideration of the implementation of bicycle lanterns along bicycle routes with Northern Territory Government and the Police, and alternative solutions

As part of routine maintenance processes, remove all the old curved yellow rails which prevent vehicle access to paths. Replace with centre bollards as per Austroads guidelines, only where absolutely necessary to prevent vehicle access.

6 Objective 4: 'Whole of Journey' Approach

6.1 Current Situation

Presently there are few bicycle parking facilities in Darwin, and the consultation processes identified that there are concerns regarding bicycle security, as well as higher rates of theft reported amongst riders.

There are bike parking facilities at some major attractors such as the CBD, Casuarina Square and in some locations along the foreshore. These facilities tend to be in less visible locations and may require improved directional signage from paths to parking facilities. It is necessary to increase the bicycle parking facilities at key destinations as well as ensuring existing bicycle parking is secure and visible. Bicycle parking should be positioned in well supervised areas to reduce the theft of bicycles.

Recently, secure bike parking such as bike cages has been introduced at key locations (Casuarina Square and the Chinatown car park) by both Northern Territory Government and City of Darwin.

Through the saddle survey and consultation feedback, it has been noted that there is limited signage in place for the cycling network in the municipality of Darwin. Signage assists with safe and orderly movement and can consist of signs or pavement markings which regulate, warn or guide road and bicycle facility users, and should be provided in accordance with industry guidance. Bicycle signage should be located on existing poles wherever possible to minimise visual clutter.

Bicycle routes should be signposted to indicate both destinations and the distances to them. Maps should be available showing the route, facilities and points of interest along it, its relationship to the surrounding road system and its relationship to relevant community facilities. The map and the signposting should be consistent in terms of destination names and other information. Some maps are already available along the coastal and local tourism routes within the City of Darwin, however these could be further developed.

6.2 Proposed Approach

One key aim of this objective is to ensure that each component or part of the cycling journey is considered and appropriate facilities are provided. The whole of journey approach to riding refers to the resources and tools available from the moment a person decides to make a trip by bike, to when they park their bike and continue on to their destination.

Mapping, available in printed form, but also online, is extremely useful for new riders when planning their routes. The City of Darwin website was the 'go to' resource identified within the consultation survey process and the City should continue to build upon its online cycling resources (as set out within Section 7).

Signage, drinking fountains, toilets, seating, lighting, shade and shelter all contribute to the comfort of users along walking/cycle paths. Such support facilities tend to be particularly important for elderly users and parents with young children. Support facilities are also more valuable on recreational paths where they can increase the quality of experience. However, supporting facilities however can significantly increase the cost of providing a walking and cycle network if provided on all proposed routes. It is therefore proposed to target the provision of such facilities to locations where they would be used more frequently, and where public requests were received via consultation processes.

A summary of this approach is set out in Table 6-1.

Table 6-1 Whole of Journey Approach

Journey Stage	Explanation	Resources
Plan	Deciding to undertake a journey by bike	Printed map and web-based resources
Trip	The route to the destination	Wayfinding and signage For longer distance trips, facilities such as water fountains and bicycle repair stations could be considered
Arrival	Securing your bike and using end-of-trip facilities as needed	Bike racks for short stay trips, more secure facilities for longer duration parking Showers and lockers

The other key consideration for facilities is the user and journey type. Different trip purposes will have different needs when it comes to end-of-trip facilities. For example:

- > A commuter may want a secure place to park their bicycle inside their workplace, along with showers, lockers and ironing facilities to enable them to freshen up before commencing work for the day
- > A commuter may instead want a secure long term place to park their bicycle at a bus interchange, allowing them to complete a portion of the trip via bicycle
- > A shopper may only want a secure short term place to park their bicycle, conveniently located to their destination (e.g. close to the entrance of a shopping centre, or on the footpath in a 'main street' environment) which is ideally protected from wet weather
- > A recreational rider generally has end-of-trip facilities at their own home but may require a secure place to park their bicycle at an intermediate destination, such as a cafe or a park.

“All of the markets would benefit from some serious bike parking facilities so as to encourage more people to ride and reduce traffic congestion.”

Vision for Bike Riding in Darwin - Online Survey Respondent

The information below references the trip and arrival stage of the journey, with 'plan' resources being identified within the Behaviour Change Strategy.

6.3 Trip and Arrival

As previously identified, the Northern Territory Government has a wayfinding and signage audit and strategy development programmed and this action should be undertaken as a priority, with City of Darwin as a key project partner. A range of signage improvements and suggested locations for trip and arrival facilities, based on the framework set out Table 6-1, has been identified through desktop review and the saddle survey process.

Table 6-2 Framework for Public Facilities

	Trip	Arrival
Regional	Wayfinding and signage Longer distance commuters – where regional paths meet, opportunity for cycle 'station' for repairs.	Short stay/visitor bicycle parking – undercover where possible Longer stay, secure parking provisions for staff End-of-trip facilities*
Urban and Recreational	Wayfinding and signage Opportunity for water fountains/bike pumps, collocated with parks and centres.	Short stay/visitor bicycle parking – undercover where possible Longer stay secure parking provisions for staff (where appropriate)
Neighbourhood	Cater for short trips, focus on wayfinding and signage	Bike parking within local parks and at local shops Schools provide designated bicycle parking undercover

* Long term end-of-trip facilities for commuters are generally provided by the employer; however City of Darwin does currently provide public long stay end-of-trip facilities within the Chinatown car park.

Short-term end-of-trip facilities should generally be in the form of simple u-rails or other design which facilitates the secure parking of a bicycle. In accordance with Austroads guidelines, these should be located along 'main street' type shopping strips and in small clusters at the entrances to shopping centres and other significant destinations. Through the development of the Bike Plan, a range of locations have been identified for the provision of bike racks, as well as suggested locations for bicycle repair stations and bike pumps, reflecting the framework for public facilities set out in Table 6-2. Consideration of providing bike parking at major events is also recommended as part of the Bike Plan.

Recommended locations for these facilities have been mapped and are included in Figure 3 in Appendix A.

Bicycle parking at schools is important to encourage students to ride to/from school. It is understood that the majority of schools within Darwin presently have some form of bicycle parking facility, ranging from simple u-rails to secure cages. The key considerations for bicycle parking at schools include:



- > Convenience and safety – the parking should be located close to the classrooms and not at the far end of the playing fields. Easy access from the approach routes is also important alongside safe travel away from other road users
- > Security – the student, and their parents, need to be confident that their bicycle will not be vandalised or stolen at school and therefore the parking needs to be secure. The ultimate solution to this is a lockable bicycle cage, controlled by staff,

While parking at schools is primarily the responsibility of the school itself, both City of Darwin and the Northern Territory Government should encourage schools to be involved in improving their cycling facilities. This is a key consideration for the development of the proposed neighbourhood routes which are based on providing improved access to local facilities such as schools.

Reflecting Darwin's tropical climate, shade through provision of non-deciduous trees, can also be provided along many paths as part of streetscaping works and can greatly improve the comfort of users. Provision of shade and shelter should be considered within design processes.

Lighting of paths can improve personal safety for night time users but can also be expensive to install and maintain. Specific standards apply to provision of lighting for pedestrians and cyclists on roads and paths, and should be considered for further review in the future.

Supporting Actions – recommended to be undertaken during the life of the Plan:

Increased availability of bicycle parking within the CBD, in local centres and at key destinations in the network and use of CPTED principles to improve safety and security in design and location of bicycle parking. Proposed locations for racks identified in Figure 3 in Appendix A. Consideration of developing a commercially viable bike hire or bike touring operation should also be investigated.

Removing barriers to riding through the provision of mid-trip facilities at key points within the network including East Point, Casuarina Coastal Reserve/Rapid Creek Path and Marrara Sports Precinct. Proposed locations for facilities have been identified in Figure 3 in Appendix A.

In Darwin, the recreational shared paths along the waterfront areas are high use in both directions, for both commuters and recreational users. Consultation noted anecdotally a large number of pedestrians using the paths (however only counts for riders have been provided). Widths on the foreshore pathways, Nightcliff and East Point particularly, are constrained in parts and conflict between users can be an issue.

Ideally, the foreshore pathways would be widened to cater for the high demands or a separate facility be provided so that cycle and pedestrian movements can be separated; however due to a range of constraints alongside the path there are limited opportunities. As a result, it is proposed that a more detailed investigation occur to determine options for improving the foreshore facilities. In the shorter term, it is recommended that the painted separation lines along these paths (and others) be well maintained to increase awareness and guide users to “keep left” whilst using the path. It is further recommended that educational methods be investigated and implemented along the route explaining rules and etiquettes on shared paths (e.g. keep left rule, give way rules and use of warning bells).

Understand the existing and future provision of and demand for end-of-trip facilities within workplaces in the municipality of Darwin, particularly the CBD. This process should include:

- Review usage and gather feedback from subscribers to the Bike Pod – need to understand why/why not being used and
- Work with the Northern Territory Government to survey key workplaces and their provision of end of trip facilities.

This will help inform future investment in end-of-trip facilities.

Work with the Northern Territory Government in order to provide increased access to bike parking (including secure bike parking) for public transport interchange in the City Centre and the Cullen Bay ferry terminal.

Lighting audit of off-road paths and popular evening cycle routes.

Develop active transport tourism routes in conjunction with Northern Territory Government and local tourism operators

Encourage and support where possible opportunities for commercial bike hire operators

Work with Northern Territory Police to promote messages to increase bicycle security, including the correct use of bicycle locks and the use of lights and reflectors when riding in the evenings.

Improved signage for water fountain facilities to raise awareness of their availability and location. More drinking fountains were requested through the online survey, however City of Darwin records suggest that there are numerous drinking fountains regularly available throughout the network and improved wayfinding and signage may increase public awareness of such facilities, as well as inclusion within bicycle network maps. Locations for consideration for future water fountains are mapped in Figure 3 in Appendix A.

‘Security for bikes in public places. Despite being within riding distance, I won’t ride my bike to Casuarina shopping centre, library, shops etc. due to the lack of secure places to lock a bike.’

Vision for Bike Riding in Darwin - Online Survey Respondent

6.4 Private Provision

6.4.1 Planning Requirements

Long term end-of-trip facilities for commuters are generally provided by the employer. City of Darwin and Northern Territory Government's involvement in this should be in the form of:

- > Requiring new developments to provide a certain standard of end-of-trip facilities for both employees and visitors (including secure parking) and
- > Providing suitable end-of-trip facilities for employees and visitors at its offices, depot, libraries etc.

Land use planning and development control within Darwin is the responsibility of Northern Territory Government. However, City of Darwin provides comment on planning applications to the Northern Territory Government to represent the interests of the Darwin community. City of Darwin also formulates and executes developer contribution plans in accordance with the Northern Territory Planning Act. It is noted that the Northern Territory Government requires all relevant development applications to provide cycling facilities as per the Austroads guidelines. This has been effective in increasing end-of-trip facilities in new buildings.

Table 6-3 provides an overview of the existing planning requirements for provision of end-of-trip facilities and suggested approach.

Table 6-3 End-of-trip Requirements

Existing	Suggested
<p>Limited mention of cycling is made within the existing Northern Territory Planning Scheme. Within Part 4, Section 8.2 sets out that:</p> <p><i>“Commercial and other Development in Zones HR, CV, CB, C, SC, TC, OR, CP, FD and T should: ...</i></p> <p><i>(O) Provide bicycle access, storage facilities and shower facilities.”</i></p> <p>Other references include Section 11.2.2 Residential Subdivision, <i>“provide a high level of internal accessibility and external connections for pedestrian, cycle and vehicle movements”</i> and general principles regarding <i>“integrated and efficient transport network”</i>.</p>	<p>The Department of Lands, Planning and Environment is currently investigating the potential to extend the existing requirements for end of trip facilities in the N.T. Planning Scheme by specifying minimum requirements.</p> <p>It is recommended to include specifications for provision of bicycle parking (quantity and quality) within the Planning Scheme, associated with various land uses and associated trip demands. Austroads sets out guidance for end-of-trip requirements.</p> <p>In addition, reflecting industry trends, requirements should also include the provision of showers, lockers and drying facilities within new developments.</p> <p>For example in Queensland, from 26 November 2010 the provision of end-of-trip facilities became mandatory through its inclusion within the QDC Mandatory Part (MP) 4.1 - Sustainable Buildings.</p> <p>The minimum level of facilities to be provided for cyclists, joggers and walkers at their place of work is specified as:</p> <ul style="list-style-type: none">▪ secure bicycle parking (for 5% of the workforce)▪ locker facilities (ratio of 1.6 to every 1 bicycle parking space)▪ various levels of changing facilities (including wash basins, mirrors, and showers with hooks and seating within each cubicle).

The network plan and infrastructure design guidance could be used as a reference document to inform development requirements for the provision, upgrade or retention of bicycle infrastructure and facilities in future.

“All workplaces should have end-of-trip facilities, all new developments (commercial and residential) should have end trip facilities, funky and extensive bike parking required at all shopping centres, recreation areas, Waterfront”

Vision for Bike Riding in Darwin - Online Survey Respondent

6.4.2

6.4.3 Voluntary Improvements

There is a range of reasons why investing in bicycle end-of-trip facilities within private developments may be an attractive option for businesses, including increasing overall parking capacity at little cost, gaining a competitive advantage by attracting bicycling customers and attracting and retaining health and environment conscious employees. Supporting these business incentives is a range of organisational initiatives for industry recognition and financial benefits; a selection of examples are provided below.

“Greater participation, particularly workplace commuting. Better end-of-trip facilities and more workplace engagement. Once people start structuring their daily work lives around a workplace commute bike riding becomes far more habitual for other purposes too.”

Vision for Bike Riding in Darwin - Online Survey Respondent

6.4.3.1 Bicycle Friendly Businesses Awards

Sydney, Toronto, Denver, Boulder and Boston are just some of the local authorities with Bicycle Friendly Business Award programs. Within Australia, a similar program is operated by Bike Safe, a community group operating in the Geelong region. These programs recognise and pay tribute to local businesses supporting cycling in their area by demonstrating leadership in encouraging cycling by employees and/or customers.

Across Australia, the Australian Bicycling Achievement Awards (run by the Cycling Promotion Fund, an initiative of Bicycle Industries Australia Ltd) are run annually and include a category for Cycling Friendly Business. This award is for businesses whose core operation is not related to cycling or the sale of cycling related products. The award recognises commitment by a business in promoting or providing increased opportunities for its staff or customers to participate in bike riding. Previous award winners have proven their commitment to cycling through a variety of initiatives such as providing secure bike parking, shower and change facilities, and offering economic incentives for employees who cycle to work.

6.4.3.2 Business Grants and Support

City of Sydney Environmental Grants

The City of Sydney offers an Environmental Grants Program for which applications are accepted twice a year. Round 1 provides funding over \$5,000 (excluding GST). Round 2 funding is up to \$10,000 (excluding GST). Any applications over \$30,000 require the applicant to have met with a Sustainability Officer to discuss their proposal. Cycling programs (including any or all of increased trips to the City by bicycle, increased end-of-trip facilities etc.), Green Travel Plans or other programs designed to increase use of sustainable transport are all considered eligible for the Grants.

City of Perth Environmental Grants

The City of Perth provides support for its community through the Environment Grants and Sponsorship Program. Over the last three (3) years, the City of Perth has provided a number of city-based environment grants and sponsorship of up to \$10,000 to support and encourage innovative projects.

Recent Environment Grants and Sponsorship Recipients have included a range of sustainable and active transport projects such as:

- > Solar Bike – The Big Issue Electric Bike Project Solar Bike will build an electric cargo bike to replace the car currently used to distribute The Big Issue magazine to retailers in Perth. The bike is expected to reduce carbon emissions by at least 1 tonne per annum
- > EMC Solar Construction Pty Ltd Electric Vehicle Charging Station at EMC House. The charging station will provide a free charging point in West Perth for electric vehicles
- > Women’s Health Services – Five (5) bike racks were installed along with security fencing and end-of-trip shower facilities to assist in reducing greenhouse gas emissions.

Free Bike Racks for Businesses

Take a Stand – Transport for London, UK has provided more than 3,000 free cycle stands in 250 business premises across London since 2007. The offer is available for any business within London with a minimum of 50 employees and can provide up to 20 free u-rails, which can accommodate up to 40 cycles.

San Mateo County in California reimburses business 50% of the cost of installing secure bicycle parking, such as bicycle cages or lockers. The County reimburses up to US\$500 per unit of bicycle parking, while Santa Cruz County provides any business, public agency, or non-profit organisation a subsidy of up to US\$1,000 towards the purchase of any other eligible type of bicycle stand or rack.

6.5 City of Darwin Examples

As part of the initial consultation survey, a number of bicycle friendly workplaces and businesses were identified, those that provided excellent facilities for staff, or were welcoming to riders.

Workplaces included Charles Darwin University, Royal Darwin Hospital, the City of Darwin and a number of government departments. Several bike shops – Bikes to Fit, Cycle Zone and Blue Cycles were mentioned specifically as well as Café Central. Opportunities to raise awareness of cycling-friendly businesses and workplaces may encourage others to become involved, and improve how they cater for those arriving by bike to their workplace.

City of Darwin currently offers grants for environmental initiatives which could include opportunities to support voluntary improvements in bicycle end-of-trip facilities and similar cycle friendly moves within workplaces across the city. This makes use of existing grants and does not include provision for additional funds.

Supporting Actions – recommended to be undertaken during the life of the Plan:

Promotion of City of Darwin's Community Grants Program to local cycling groups to encourage provision of community events in support of bicycling such as Dr Bikes sessions (free bike maintenance), cycle confidence training or led rides. This could also include opportunities to support businesses to improve their own bicycle end-of-trip facilities.

Availability of bike racks on request – purchase of approximately 10 bike racks each year, available for businesses that wish to provide bicycle parking outside their shop frontages or similar.

A bike friendly businesses recognition scheme could be developed for City of Darwin, encouraging members to display their membership for existing and potential customers and staff

Work with the Northern Territory Government regarding the development of End of Trip (EoT) provisions and requirements for applications within City of Darwin.

7 Behaviour Change Strategy

7.1 Recommended Behaviour Change Approach and Activities

There are many models for using promotion to encourage behaviour change. Table 7-1 provides an overview of the considerations based on Prochaska's model of the Stages of Change. This model is considered appropriate for Darwin, and provides a clear framework for identifying suitable promotional activities in order to increase the uptake of cycling for transport purposes. Specifically for the "Enthusied and Confident" and "Interested but Concerned" segments it provides focus on activities that promote 'everyday' cycling in a positive manner and focusses on tools to overcome identified barriers to cycling.

Table 7-1 Behaviour Change Approach

Stage of Change	Individuals Perception	Potential Activities and Interventions
Pre-contemplation	Not considering bike riding	Raising the awareness of cycling Introduce messages that portray riding as an activity that individuals associate with in a positive manner.
Contemplation	Aware of bike riding, the benefits and interested in finding out more	Ensure that tools and resources are available to support potential riders seeking information.
Preparing	Would like to give riding a go	To be able to ride appropriately, have access to a bicycle, to know how to ride it and have the relevant resources and facilities provided.
Action	Riding in Darwin	Ensure infrastructure and supporting facilities are well maintained, safe, legible and convenient so that the new rider has a positive initial experience.
Maintaining	Riding again	Positive reinforcement – or the rider may not choose to ride again and relapse into their old behaviour (non-bike riding).
Relapse	Stopping riding	The rider may re-enter the stages of change at any of the above steps.

7.1.1 Raising the awareness of cycling

These activities ensure that positive messages regarding cycling are included wherever possible in order to raise awareness of cycling throughout the Darwin community. Particularly for Darwin, celebrating the introduction of new infrastructure should provide an important opportunity to raise awareness of cycling and encourage the wider public to give the new infrastructure a go.

Examples: Information regarding cycling related activities being included on the City of Darwin website, in local media, in newsletters and at community events. Opportunities to capture and promote feedback from riders regarding why they enjoy riding in Darwin could also be included in this material (or sourced from the initial consultation survey). Positive imagery of cycling, and local infrastructure where possible, should be included in City of Darwin publications, plans and reports whenever appropriate.

7.1.2 Tools and Resources

In order to support those who may be considering cycling, knowledge of the provision of infrastructure through route maps, visible bicycle parking in convenient locations, guidance on cycling etiquette, road rules and cycling safely are recommended to help encourage and equip them to take action.

Examples: Relevant information could be supplied electronically in downloadable format from the City of Darwin's website, made available in printed format from the City of Darwin's local libraries and community centres. As the City of Darwin will be looking to introduce new types of cycling and road user infrastructure through the Bike Plan project, it is recommended that additional education and promotion be associated with these changes, to ensure all users are informed and advised of the appropriate use of the new facilities.

7.1.3 To be able to ride appropriately

In order to ride a bike, you must have access to a bike to ride, and know how to ride it appropriately. To address this barrier, promoting cycle training courses is recommended, in order to introduce new riders or increase confidence for the inexperienced rider. This could be an option for the Darwin community and/or delivered in partnership with existing cycling groups.

Examples: Cycling education courses and led rides could be provided, or existing courses offered by cycling groups promoted.

7.1.4 Infrastructure and supporting facilities

The Bike Plan provides a detailed list of recommendations regarding potential cycling infrastructure requirements, supporting facilities (such as bike racks) and the importance of maintenance. Cycling and other community events could be associated with the opening of specific bicycle routes and facilities as completion of the recommended infrastructure programs occur, along with ensuring appropriate promotion and education regarding the new facilities. Other supporting infrastructure could include signage and wayfinding tools, bicycle maintenance facilities, such as air pumps, as have been recommended elsewhere in the Bike Plan.

7.1.5 Positive Reinforcement

To encourage those who start riding to continue riding, infrastructure must meet users' needs and provide for a positive experience. To further reinforce this behaviour, opportunities to recognise and/or reward bike riders should be considered. In addition, regular maintenance of bike facilities is needed to reinforce the importance that the City of Darwin places on cycling.

Examples: Cycling surveys and counts to demonstrate and promote improvements to the wider public, alongside using community events to recognise bike riders. Darwin already participates in Super Tuesday, and Bike Week through Ride to Work Breakfasts, to provide opportunities to both promote cycling and recognise existing riders.

Alongside the above mentioned examples, a number of specific activities for consideration are included in Table 7-2. It should be noted that the bulk of the activities included within the Behaviour Change strategy will be achieved through the ongoing integration and consideration of bicycle riders within Council's existing activities.



Table 7-2 Proposed Actions and Suggested Activities

Proposed Actions	Criteria Addressed					Suggested Activities
	A Raising awareness of cycling	B Tools and Resources	C To be able to ride appropriately	D Infrastructure and supporting facilities	E Positive Reinforcement	
Including cycling as part of existing community events	✓		✓		✓	City of Darwin has an active role in delivering and supporting a wide range of community events throughout the year. Regular events include the Darwin Show, Darwin Festival, Youth Week, Seniors Month, numerous school holiday programs and Australia Day. Providing information to support those riding to events (i.e. identified routes, location of nearest bike parking etc.) and opportunities to incorporate 'tools' to encourage riding should be considered. For example, free bike 'health checks' could be offered for those that ride to the Darwin Festival in partnership with local bike shops. Provision of temporary bike parking for events could also be provided.
City of Darwin actively participating in existing cycling events and potentially developing its own 'BikeFest'	✓		✓		✓	<p>The various cycling groups within Darwin undertake a range of events, on a weekly, monthly and annual basis. These events are normally promoted directly to their members and contacts. City of Darwin could help to promote these events via its existing communication tools (see below).</p> <p>City of Darwin currently provides Smoothie Bike at community events for free which promotes cycling as a fun and healthy activity.</p> <p>An additional opportunity exists through the Gran Fondo event. This event appears to be widely supported by most of the cycling groups in Darwin. It sees approximately 500 (local and national) riders undertake a long distance ride (120km) from Mandorah to Darwin. For example, shorter rides that may appeal to a wider audience could be developed to support this event, sites in Darwin could hold community 'Bikefest' events or the trail itself could be marked for use all year round for fitness riders and tourism.</p>
Including cycling in existing community communication tools	✓	✓				Healthy Darwin send out newsletters on a quarterly basis, including promotion of the Bike Skills sessions offered via this initiative. Through the Bike Plan development process, hundreds of people have opted in to hear more about bike riding in the City in future. This should be developed into an ongoing engagement and promotional tool for City of Darwin and project partners.
City of Darwin website to include cycling information and advice	✓	✓				<p>Initial survey results suggest that City of Darwin's website would be a 'first stop' when looking for cycling information. It is suggested that City of Darwin undertake a review of the information provided online to enable a 'one stop shop' for riding resources; this may include the Bike Plan webpage.</p> <p>A desktop review suggests a wealth of information is provided via the various agencies and initiatives offered; however, this would be easier to access for the public through a restructuring of pages and links. For example, the City of Darwin website includes:</p>

Proposed Actions	Criteria Addressed	Suggested Activities
<p>Maintain a current map of bike routes and supporting infrastructure</p>	<p>✓ ✓ ✓</p>	<p>A. A Maps and Facilities page. Under the Cycle Paths section, a Google based map is provided, with printed maps access via a 'Find out more' button.</p> <p>B. This map is also available via a link on a page called 'Healthy Cycling' within the Healthy Darwin offering.</p> <p>C. Through the Sustainability@TheTop webpages, additional information is available on riding including external links to local and national resources.</p> <p>Northern Territory Government also provides a number of web pages via the Travelsmart pages, including road safety, participation information and fault reporting. City of Darwin also has an online fault reporting system in development, including the ability to report maintenance issues of pathways and roads. Once this tool has launched, it should be promoted to the bike riding community.</p> <hr/> <p>Through the saddle survey process it was noted that there are currently a few errors included in the existing mapping regarding routes:</p> <ul style="list-style-type: none"> Path shown behind Darwin Sailing Club on map is not provided Rapid Creek path from Carrington Street to McMillans Road shown in the wrong location <p>These issues should be updated in the next print of the cycling map.</p> <p>It is recommended that the existing standard of path be made clearer in the mapping with a simple format for everyday users (i.e. major, minor and local or similar).</p> <p>Incorporation of locations of supporting facilities such as bike racks and water fountains is also recommended, particularly as the provision of these facilities expands.</p>
<p>Practical support to remove barriers such as the required skills and costs associated with bicycle maintenance</p>	<p>✓ ✓ ✓</p>	<p>Provide bicycle air pumps and cycle maintenance facilities (Bicycle Repair Stands) at key points in Darwin – particularly at bus interchanges and busy recreational and commuting routes. This could be pursued in partnership with DoT. A suggested approach for provision of these facilities is set out in the section regarding the 'Whole of Journey Approach'.</p> <p>Information regarding locking your bike safely and securely should also be included.</p>
<p>Monitoring the levels of cycling trips and attitudes towards cycling</p>	<p>✓ ✓</p>	<p>City of Darwin and Northern Territory Government currently undertake a range of monitoring activities for cycling trips, particularly commuting. A program of evaluation and monitoring has been included in the 'Communications and Evaluation Strategy'.</p>

It has been identified through the Bike Plan development process that Darwin provides a number of opportunities for incorporation of cycling into events and programs currently offered by the City of Darwin and Northern Territory Government.

However, limited funding is available to undertake these types of projects on an ongoing basis. For example, funding for the Healthy Darwin program will cease from the 30 June 2014 and as a result there is no budget for future delivery of cycling promotion activities. City of Darwin has advised that only a minor number of led rides would be achievable without additional funding. Currently two beginner Sunday rides are supported weekly (Parap and Wulagi).

Therefore, the activities contained within the Bike Plan focus on maximising existing events and activities for promotional exposure for bicycle riding. It is recommended that City of Darwin undertake ongoing review of all projects identified and consider whether:

- > there are opportunities for funding from other sources and
- > the initiative can be integrated into the delivery of another project (e.g. TravelSmart, other physical activity and health, community, workplace or school programmes, etc.).

These reviews should be undertaken in co-ordination with delivery partners such as the Northern Territory Government.

Maximising external support and provision of events provides a range of 'quick wins' for the City of Darwin to raise the profile of cycling within the community while the cycling network and associated infrastructure is implemented. However, it should be noted that alongside encouragement of cycling, education and activities regarding improving road user behaviour for riders and other motorists should be undertaken to ensure that the cycling culture of Darwin develops in an integrated and positive manner as set out in Objective 1. This is a particular focus for the implementation of new infrastructure to ensure that all users are aware of the appropriate behaviour on these routes.



8 Prioritisation

The Implementation Plan represents the activities intended to be delivered and implemented over the next 5 years. Priorities have been developed in order to determine which activities and works should be completed first.

8.1 Qualitative Scoring Process

A qualitative scoring system has been developed to prioritise the City of Darwin's infrastructure works recommended in this Plan and is described below. The system is based on the vision and objectives developed in Section 2 of this document and reflects input received from the community and other stakeholders. The factors and their considerations are included in Table 9-1 below, and were all considered under equal weightings.

It should be noted that for the first year of the Plan, added priority has been given to resolving some maintenance issues, while still delivering network enhancements for the community.

Table 8-1 Qualitative Prioritisation Factors

Factor	Considerations
Community Request/Saddle Survey Recommendation	Notable feedback from Consultation processes or identified within saddle survey
Safety	Crash history Potential for vulnerable users (i.e. adjacent to school or local centre)
Connectivity	Provide a link to attractors and/or generators Enhance the network by filling an existing gap
Trip Type	Transport related routes/initiatives scored to reflect the potential for financial support from Northern Territory Government
Existing/Potential Demand	Consideration of potential population served and existing ridership
Cost	Preliminary costs developed for each project

From a strategic perspective, and reflecting the commentary received via the consultation processes, the need for significant improvement in the quality, safety, connectivity and continuity of cycling facilities on Bagot Road is considered the greatest priority for infrastructure within the municipality of Darwin.

This link represents the most important north-south barrier to riding in the municipality and will be required to be delivered in order to reach Darwin's cycling potential. As noted in Table 8-1, investigations for improvements for this route are currently underway by Northern Territory Government, and the Bike Plan also includes a range of recommendations for Bagot Road (and other Northern Territory Government infrastructure), for their consideration and development as appropriate. The planned improvements to the Casuarina Coastal Reserve shared paths (as set out in Table 8-1) will provide a much needed improvement for this important corridor which represents Darwin's busiest commuter route and a popular recreational ride.

For infrastructure within the City of Darwin's jurisdiction, the delivery of city centre bicycling facilities is the top priority. At present, infrastructure in the city centre has been identified as on-road bicycling facilities, and priced as bicycle lanes. Opportunities to provide separation (physical or spatial) from traffic will be explored within design development processes, reflecting feedback from the community of support for infrastructure separated from traffic and depending on available road width.

Ridership along Progress Drive and Dick Ward Drive has doubled in recent years, and represents an important north-south route, particularly in the absence of high quality, convenient bike riding facilities along Bagot Road. The planned improvements for the Casuarina Coastal Reserve are likely to further increase cycling demand along this corridor, both for commuters and recreational riders.

8.2 Funding

The majority of funding for implementation of the Bike Plan will be spent on infrastructure. This reflects that provision of infrastructure and engineering safety improvements will provide the greatest contribution towards encouraging more people to cycle in the municipality, and is the greatest priority as identified by the community via the consultation survey.

However, it is also necessary to spend a proportion of funding on the supporting strategies of education and encouragement. These strategies are not as costly to implement but will also contribute towards improved safety and assist in encouraging more people to cycle. These strategies also allow the City of Darwin to promote the services and infrastructure they are providing for the community.

City of Darwin may have allocated a budget of up to \$500,000 per annum for each year of the Plan. However it is noted that additional funding sources may also be available via the Northern Territory Government and other government agencies. The Northern Territory 2014/2015 budget includes \$1 million for cycle paths (Territory wide) and an additional \$600,000 for minor new works and maintenance in the Darwin region.

As set out in Section 8, the City of Darwin should continue to be aware of and pursue funding from other sources to contribute towards implementation of the Bike Plan.



8.3 Future Projects

A number of additional projects have been identified for further consideration through the development of the Bike Plan, including planning opportunities, feasibility and design studies, including large scale investigations. These additional projects should be considered within the lifetime of the Bike Plan with relevant project partners and stakeholders, particularly if supplementary funding becomes available.

Additional projects and future considerations include (in no particular order):

- > Further end of trip facilities (subject to recommended investigations as included within the Bike Plan actions)
- > Bagot and Totem Roads, Coconut Grove intersection (recommended design and signals review)
- > Additional pedestrian and cycling bridge connecting Rapid Creek and Casuarina Coastal Reserve, and/or a more direct route to Alawa to improve convenient access to Casuarina Square (through mangroves/wetland areas)
- > Recreational path extensions through Casuarina Coastal Reserve to Lee Point
- > Feasibility of cycling connectivity between the Esplanade and the Darwin Waterfront
- > Opportunities for pathway connections from Little Mindil to Cullen Bay via the cliff edge
- > The opportunity held by the future development of Casuarina Square to provide
 - improved permeability of both the shopping centre and Casuarina public transport interchange for bicycle riders and pedestrians and
 - development of Dripstone Road as a key cycling and pedestrian route.
- > Options for improving cycling connections into Winnellie and the future development areas to the south west of the Airport including:
 - Provision of a connection from Bagot Road south through to Tiger Brennan Drive
 - Future planning for Hook Road, Amy Johnston Avenue and Berrimah Road
 - Cycling provisions into Hidden Valley.
- > Dick Ward Drive and Fitzner Drive – potential reconstruction and opportunities to enhance/provide active transport connections
- > Widening of the Trower Road/Rapid Creek Bridge
- > Additional crossing provisions to improve integration of laneways with the shared path network for pedestrians
- > Stuart Park Transport Study and cycling connections through future development processes and
- > Trials of initiatives such as allowing bike riding within The Mall during selected periods.

9 Evaluation and Communication Processes

9.1 Existing Communication Processes

City of Darwin undertakes regular consultation and communication with some bicycle focus groups (i.e. quarterly meetings are currently undertaken with Bicycle NT), and similar discussions and relationships exist within the Department of Transport through the Bicycle Working Group (BWG). However, as a result of the Bicycle Working Group not currently meeting regularly, normalised communication and consultation processes are not currently in place. Reporting regarding bicycle related matters is undertaken on an as required basis, dependent on arising issues.

The Department of Transport coordinates a Bicycle Working Group with representatives from local government, Northern Territory Government agencies and community groups. The group aims to meet at least twice yearly; however, it is noted that the group has not met regularly over the last 12 months.

9.2 Existing Evaluation Processes

Between the City of Darwin and the Northern Territory Government, a significant amount of data is captured regarding riding in Darwin, particularly for commuting trips. However, the focus for each data set is slightly different, and the methodology and reporting approaches mean that the majority of results are not comparable. However, they do provide a valuable data source for future infrastructure evaluation for commuting habits. Capturing information regarding local trips is a particular challenge, as counts on routes can be misleading due to the widespread nature of trips, geographically and temporally. Data considered within the background information has included:

Commuter Riding Information

- > Wet/Dry season commuter bicycle counts (including on-road and off-road) – intersection totals
- > Bicycle Network Super Tuesday commuter bicycle counts (provide movement information at intersections)
- > ABS data related to commuter riding.
- > Some information regarding workplace travel planning has also been captured.

Recreational Riding

- > Bicycle Network Super Sunday recreational counts.

Participation Surveys

- > ABC Cycling Participation Survey, sample of households to gauge participation in riding, bike ownership and types of journeys
- > City of Darwin Community Satisfaction Survey, sample of households including questions related to riding.

Cycling Crash Data

- > Northern Territory Government's reported crash data for bike riders (2008-2012).

9.3 Proposed Evaluation and Communication Strategy for the Bike Plan

9.3.1 Communication and Reporting Strategy

The Darwin Bike Plan provides a strategic direction and Implementation Plan for increasing bicycle trips over the coming five (5) years. The Implementation Plan identifies the prioritised actions for Darwin, aligning with the four (4) key objectives and overarching vision for riding in Darwin.

It is proposed that progress on the Implementation Plan is reported annually, while the implementation of specific projects may be reported more frequently. The development of the Bike Plan has established a Project Control Group (PCG) consisting of members of both the City of Darwin and the Northern Territory Government, and it is proposed that this group continues to meet on a regular basis (for example, quarterly) to review implementation of the various initiatives within the Plan. This will ensure that delivery of projects occurs collaboratively, providing efficiencies for both the Northern Territory Government and the City of Darwin. This group also provides a forum for identifying common issues across government departments and opportunities for coordinating future planning processes.

Proactive external reporting of progress will be included within the Implementation Plan. Through the initial consultation phase for the Bike Plan, members of the public registered their interest in being kept up to date with cycling initiatives in Darwin. It is suggested that this email list be used in future (for example, quarterly) to communicate key messages to the broader community. This may include promotion of the Ride to Work breakfast events, the completion of new infrastructure or results from the latest bicycle counts. Bicycle groups have voiced an interest in remaining regularly consulted with on projects and review processes, and the establishment of a Bicycle Advisory Group could be considered by the PCG in future. This could build upon the framework set up by Northern Territory Government's previously established Bicycle Working Group.

A review of the Bike Plan's objectives and progress towards targets should be undertaken every year by the PCG to ensure the Plan remains relevant, transparent and accountable. The results of this review should be presented for discussion with the City of Darwin and Northern Territory Government representatives to ensure that the Bike Plan is responsive to emerging trends, revised planning directions, and City of Darwin and Northern Territory Government priorities. This is of particular relevance to Darwin due to the extent of planning work being undertaken at present that is likely to continue over the coming year.

A summary of the proposed communication and reporting mechanisms is outlined in Table 10-1.

Table 9-1 Proposed Communication and Reporting Schedule

Purpose	Method	Participants	How often?
Ongoing Progress – Various Implementation Projects	Meeting	PCG (City of Darwin and Northern Territory Government)	Quarterly
Regular Forum for Community Input	Meeting	PCG and Community Representatives	6 monthly
Update to Interested Members of Community	e-newsletter	PCG to co-ordinate and circulate	Quarterly
Annual Review Process	Survey and Monitoring (as below) Report to City of Darwin	City of Darwin	Annually
Bike Plan Review Process	Complete Review of Bike Plan	City of Darwin and Northern Territory Government	2018/19

9.3.2 Evaluation Framework

Evaluation of the progress and achievement of the Bike Plan and Implementation Plan is integral to this project. Changes in cycling uptake, attitudes and culture should be measured and evaluated, both for the wider community as well as for specific interventions.

City of Darwin and Northern Territory Government can then learn and refine each action, and improve results as the bicycle network and supporting initiatives are implemented. This evaluation framework reflects the objectives set out for the Bike Plan, for the City of Darwin and the Northern Territory Government and includes three (3) key processes:

- > project monitoring
- > annual monitoring and
- > A review and update to the Bike Plan.

9.3.2.1 Project Monitoring Process

Larger projects delivered within the Bike Plan should include three key stages of monitoring:

- > Prior to project initiation, clear objectives should be identified for the purpose of the work and desired outcomes. Baseline information should be identified, relevant to the project in order to gauge and evaluate contributions to these objectives. For example, for an infrastructure improvement project, the objectives may be to increase usage along the route and enhance safety – previous usage and crash history should be captured; user surveys may also be undertaken. This will enable a comparison of information to be provided following completion of the project
- > During the project, reporting should be made to the PCG and within the relevant agency (including internal reporting requirements) to keep project stakeholders and partners informed of the project's progress, any issues or opportunities and
- > Following completion of the project, a project close out report should be provided in accordance with best practice project management. This report should summarise the project and evaluation should build upon the baseline data capture (i.e. review of the usage information following the next set of counts) in order to understand the project's performance to the objectives set. A review of the project delivery, which includes consideration of whether the project was delivered on time and on budget, should also be included
- > This process should be refined as the Bike Plan is implemented.

9.3.2.2 Annual Monitoring Process

An annual monitoring process is proposed in order to evaluate and report on progress of the Bike Plan.

The following key indicators (sourced from the annual Community Satisfaction Survey) have been identified for reporting for the plan, and relate directly to the targets proposed for the Bike Plan:

Where are we now?	In 2019 we will achieve:
57% never ride a bike	55% report riding a bike (i.e. 20% reduction from 'never' riding a bike)
30% ride a bike once a week or more	36% ride a bike at least once a week (20% increase)
3.6 out of 5 for satisfaction with footpath and bikeways	4 out of 5
Close to 9% of bike trips were made for transport purposes	18% of bike trips are made for transport purposes
4.1% of commuters ride to work (2011)	5% of commuters ride to work (2016 – 20% increase)
Between 2008 – 2012 there were 148 bicycle related crashes reported	Ongoing reduction in the number of bicycle crashes reported in Darwin

The annual reporting process should summarise the projects undertaken during the year and be structured to reflect the objectives of the Bike Plan. For some processes, reporting directly against the Implementation Plan actions may also be appropriate. Inclusion of the outcomes for key projects and evaluation processes should be included where possible.

The ongoing existing evaluation processes should also be summarised and included within reporting in order to identify key trends. It should be noted that while most of these processes are annual, ABS data will not be available until 2017/2018 and ABC data collection is undertaken bi-annually. It is noted that electronic counters are planned to be installed at priority locations on the network by Northern Territory Government and could include useful data regarding cycling for Darwin in the future.

Of particular interest, will be the usage levels of the popular recreational and urban paths such as Nightcliff, Casuarina Coastal Reserve, East Point and Lee Point. Regular review of usage of these paths by walkers and riders will help identify capacity and conflict considerations in the future.





9.3.2.3 Review Bike Plan and Update the Implementation Plan

A full review of the Bike Plan should be scheduled to be undertaken in 2019/2020 to ensure that the Bike Plan reflects the community's priorities and a new 5 year Implementation Plan can be formulated for adoption in 2020/2021.










APPENDIX A


BICYCLE NETWORK FIGURES AND RECOMMENDATIONS

Schools

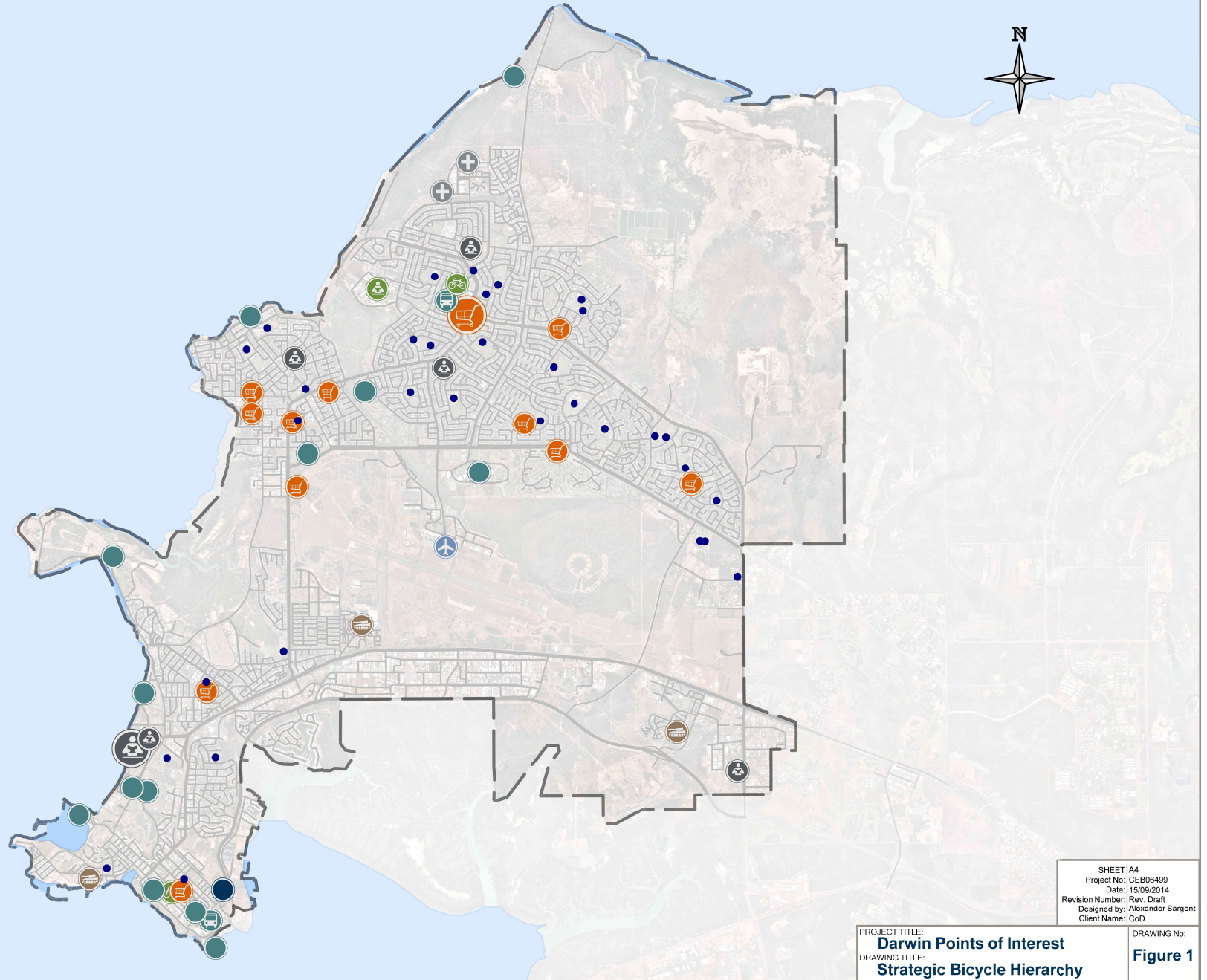
-  1,000 to 1,500
-  500 to 1,000
-  1 to 500
-  Private School

Points of Interest

-  Airport
-  Base
-  Bike Enclosure
-  Bus Interchange
-  CBD
-  Hospital
-  Major Shopping Centre
-  Shop
-  University

 Other Attraction

0 1
kilometres



SHEET A4
Project No: CE006499
Date: 15/09/2014
Revision Number: Rev. Draft
Designed by: Alexander Sargent
Client Name: CoD

PROJECT TITLE:
Darwin Points of Interest
DRAWING TITLE:
Strategic Bicycle Hierarchy

DRAWING No:
Figure 1



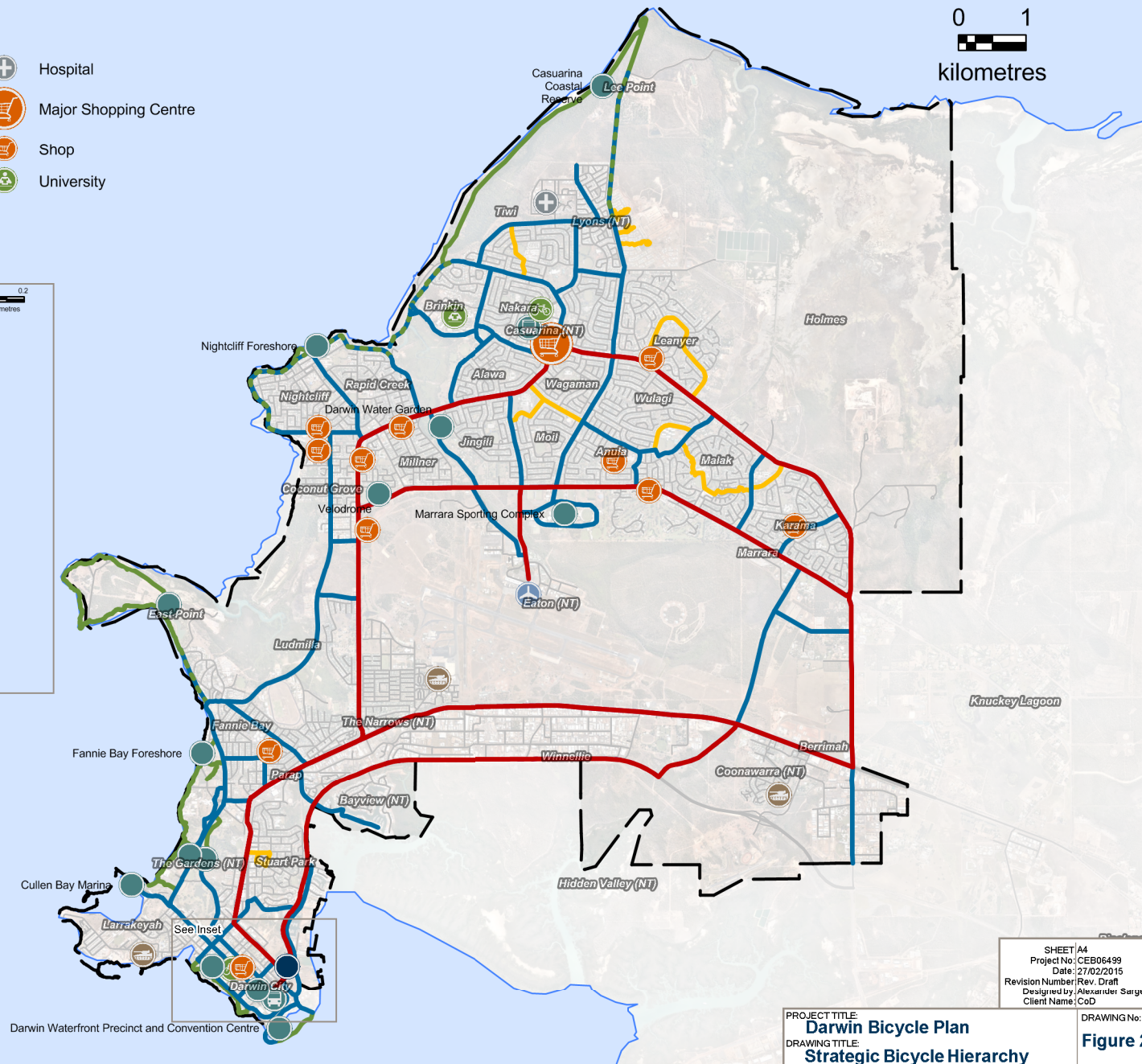
Legend

- Regional Routes
- Urban Routes
- Recreational Routes
- Neighbourhood Routes

Points of Interest

- | | |
|-----------------|-----------------------|
| Airport | Hospital |
| Base | Major Shopping Centre |
| Bike Enclosure | Shop |
| Bus Interchange | University |
| CBD | |
| Attraction | |

0 1
kilometres



SHEET A4
Project No: CEB06499
Date: 27/02/2015
Revision Number/Rev. Draft
Designed by: Alexander Sargent
Client Name: CoD

PROJECT TITLE:
Darwin Bicycle Plan
DRAWING TITLE:
Strategic Bicycle Hierarchy

DRAWING No:
Figure 2



