Newcastle Cycling Strategy and Action Plan

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The City of Newcastle

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Abbreviations

ARR	Australian Road Rules
ARTC	Australian Rail Track Corporation
BTS	Bureau of Transport Statistics
BUG	Bicycle User Group
CES	Commercial Enterprise Services (CofN)
CofN	The City of Newcastle
CSCCS	Customer Service, Communication and Consultation Services (CofN)
CWP	Cycling Working Party
DBS	Development and Building Services (CofN)
DCP	Development Control Plan
DIPNR	Department of Infrastructure, Planning and Natural Resources
ECCS	Environment and Climate Change Services (CofN)
ELT	Executive Leadership Team (CofN)
HNEH	Hunter New England Health
HRS	Human Resource Services (CofN)
HTS	Household Travel Survey
IMS	Infrastructure Management Services (CofN)
LATM	Local Area Traffic Management
LEP	Local Environmental Plan
LGA	Local Government Area
LHCTG	Lower Hunter Councils Transport Group
LHTG	Lower Hunter Transport Guide
NCC	Newcastle City Council
NCM	Newcastle Cycleways Movement
NDCP	Newcastle Development Control Plan
NPWS	NSW National Parks and Wildlife Service
OHS	Occupational Health and Safety
PAMP	Pedestrian Access and Mobility Plan
PCAL	Premier's Council for Active Living
PRS	Parks and Recreation Services (CofN)
RAMS	Roads and Asset Maintenance Services (CofN)
RMS	Roads and Maritime Services
RTA	Roads and Traffic Authority
SD	Statistical Division
SLA	Statistical Local Area
SPFMS	Strategic Property and Fleet Management Services (CofN)
SPS	Strategic Planning Services (CofN)
SSD	Statistical Subdivision
TAFE	Technical and Further Education
TEDS	Tourism and Economic Development Services (CofN)
TfNSW	Transport for NSW
UoN	University of Newcastle

Glossary

Arterial road – a road that predominantly carries through traffic from one region to another, forming principal avenues of travel for traffic movements.

Bicycle – a vehicle with two or more wheels that is built to be propelled by human power through a belt, chain or gears (whether or not it has an auxiliary motor). For the purposes of this document, 'bike' and 'bicycle' mean the same thing.

Bicycle facility – a public facility especially constructed for bicycle traffic. This term has broad use and can refer to any part of a bicycle route, bicycle path, bicycle lane, associated signage or parking equipment.

Bicycle lane – is a marked lane, or the part of a marked lane beginning at a bicycle lane sign applying to the lane; and ending at the nearest of the following:

(a) and end bicycle lane sign applying to the lane
(b) an intersection (unless the lane is at the unbroken side of the continuing road at a T-intersection or continued across the intersection by broken lines) or
(c) if the road ends at a dead end – the end of the road.

Bicycle rider – (for the purposes of this document) a person who is riding a bicycle. Other words used in this document (cyclist, rider, bike rider) mean the same thing. The Australian Road Rules also define rider as a motorcycle rider or the driver of an animal drawn vehicle but these definitions do not apply within this document.

Bicycle route – any marked lane which forms part of a bicycle network. The route may utilise different types of bicycle facilities and may be on road (bicycle lanes and bicycle shoulder lanes), or off road (bicycle paths, separated paths and shared paths) in the road related area paralleling roads or through parks and reserves.

Bicycle symbol – means a symbol consisting of a picture of a bicycle.

Bus lane – is a marked lane, or the part of a marked lane, beginning at a bus lane sign and ending at an end bus lane sign. Bus lanes may be used by bicycle riders unless they are signed 'Buses Only'.

Carriageway – a term no longer used within the Australian Road Rules but still in use within road transport engineering practice. This term generally refers to the road area as defined in the ARR.

Collector road – a non-arterial road that collects and distributes traffic in an area as well as serving abutting property. Refer to **road network**.

Contra-flow bicycle lane – a bicycle lane used in a one-way street to provide bicycle riders with two-way use of the road.

Contributions plans – plans that specify the circumstances in which the Council may impose developer contributions, generally known as section 94 contributions in reference to the section of the *Environmental Planning and Assessment Act 1979* under which they are made. These plans may apply to the whole of the Council area, to a particular district or a specific site.

Cycleway – a generic term used to describe a bicycle route, bicycle lane, bicycle path or that part of a separated path used by bike riders.

Edge line – for a road, means a line marked along the road at or near the far left or far right of the road (except any road-related area of the road).

Footpath – an area open to the public that is designated for, or has as one of its main uses, use by pedestrians.

Intersection – an area where two or more roads (except any road-related area) meet, and includes any area of the roads where vehicles travelling on different roads might collide; and the area of any slip lane where the roads meet but does not include any road-related area. In this document an intersection is also the area where an off road bicycle path or shared path intersects with a road or other bicycle path, shared path or footpath.

Local area traffic management (LATM) – the use of physical devices, streetscaping treatments and other measures (including regulations and other non-physical measures) to influence vehicle operation, in order to create safer and more liveable local streets.

Local road – a road or street primarily used for access to abutting properties. Refer to **road network**.

Newcastle City Traffic Committee - comprises representatives from the City of Newcastle, RMS, State Transit, NSW Police, State MPs and Councillors.

Off road – a bicycle path or shared path is said to be off road when it is located on a road-related area paralleling a road, or through parks or reserves or within public transport corridors and other public or private land not open to motor vehicle traffic.

On road – a bicycle facility is said to be on road when it forms part of the road such as a bicycle lane, a marked lane or a shoulder.

Road – an area that is open to or used by the public and is developed for, or has as one of its main uses, the driving or riding of motor vehicles.

Road network – the road transport planning professions recognise several different road classification systems and road types. For the purposes of this document these road types are important:

- **Motorways and freeways** are the major urban or rural roads which provide the quickest most direct access though a region or across an urban area. They have limited access to the surrounding road network and have grade separated intersections and higher speed limits.
- **State roads** provide the quickest and most direct means of travelling between regional centres and to major centres within the State. These routes offer a high priority means of travel through an area with fewer delays and a high level of consistency and quality of construction.
- **Regional roads** link State roads and highways to local roads and provide a collector distributor function in the network. These routes also provide radial access to major sub-regional centres and connections to other regional centres.
- **Local roads** provide door to door access to places where people live. They are usually low-volume, low-speed roads.

Road related area – is any of the following:

(a) an area that divides a road

(b) a footpath or nature strip adjacent to a road

(c) an area that is not a road and that is open to the public and designated for use by cyclists or animals

(d) an area that is not a road and that is open to or used by the public for driving, riding, walking or parking vehicles.

This can include the area that divides a road (median), the footpath or nature strip or an area designed for exclusive use by bicycles (bicycle paths).

Rules that apply to roads generally apply to road-related areas in the application of the Australian Road Rules.

Road reserve or road corridor – the total parcel of public land on which the road and road-related areas are located.

Separated bicycle lane – an on road bicycle lane with physical separation from other motor traffic. Separated bicycle lanes may also be referred to as protected bicycle lanes or kerb separated bicycle lanes. Separated or protected bicycle lanes located behind the kerb may be one-way lanes on both sides of the road (travelling in the same direction as the adjacent traffic lane), or two-way on one side of the road.

Separated path – a length of path where an exclusive bicycle path is laid adjoining a footpath. The separation may be visual (painted line) or physical (dividing strip or raised median). The facility begins at a separated path sign or separated path linemarking, and ends at the nearest of the following:

(a) an 'End Separated Path' sign or the end of the separated path linemarking
(b) a 'Bicycle Path' sign or bicycle path linemarking
(c) a 'No Bicycles' sign or no bicycles road marking
(d) a road (except a road-related area) or
(e) the end of the path.

Shared path – area open to the public (except a separated path) that is designed for use by both bicycle riders and pedestrians. The shared path begins at a 'Shared Path' sign and ends at the nearest of the following:

(a) an 'End Share Path' sign
(b) a 'No Bicycles' sign or no bicycles road marking
(c) a 'Bicycle Path' sign
(d) a road (except a road-related area) or
(e) the end of the path.

Shoulder – includes any part of the road that is not designed to be used by motor vehicles in travelling along the road, and includes:

(a) for a kerbed road – any part of the kerb and
(b) for a sealed road – any unsealed part of the road, and any sealed part of the road outside an edge line on the road; but does not include a bicycle path, footpath or shared path.

Sub-arterial road – road connecting arterial roads to areas of development, and carrying traffic directly from one part of a region to another.

Executive Summary

The *Newcastle Cycling Strategy and Action Plan* represents Council's commitment to enhancement of cycling in Newcastle. It builds on previous bike plans and collates and expands on cycling-related strategies and initiatives from a range of Council documents.

Providing for cycling in Newcastle aligns with efforts to increase participation by other level of government, through such documents as *The Australian National Cycling Strategy 2011-2016* and the *NSW BikePlan*.

Significant community input to the *Newcastle Cycling Strategy and Action Plan* has been captured through an on-line survey of Newcastle Voice members, through the extensive community consultation process undertaken in development of the *Newcastle Community Strategic Plan* and through feedback provided during public exhibition of the draft document.

The overall objective of the *Newcastle Cycling Strategy and Action Plan* is to make cycling a safe and attractive travel option to facilitate more people using bicycles for more of their trips. This objective supports the *NSW 2021* target of more than doubling cycling mode share for trips at a local and district level in the Greater Sydney region by 2016.

The *Newcastle Cycling Strategy and Action Plan* recognises that a combination of different strategies is needed to increase participation. It identifies a range of infrastructure improvements and social initiatives, with associated priorities and responsible service units. It also establishes a framework to monitor implementation of actions and progress towards nominated targets. Strategies and actions covering the following broad areas are proposed:

- bicycle network and infrastructure
- promotion and education
- leadership and advocacy
- planning for active transport
- monitoring and review.

Actions for each area are listed in the following table.

Specific targets include:

- in accordance with the *NSW BikePlan* target, increase mode share to cycling to 5% for trips less than 10km, by 2016
- in accordance with the *NSW BikePlan* target, double the mode share to cycling for the journey to work of Newcastle LGA residents between 2006 and 2016.

As our knowledge of cycling in Newcastle improves, targets will be progressively refined. A high priority action is the development of a monitoring and reporting regime, to assess participation in cycling and the efficacy of listed actions.

REF.	ACTIONS	COMMENT, RESOURCES	RESPONSIBLE SERVICE UNIT, PRIORITY	STAKEHOLDERS
4.	**BICYCLE NETWORK AND INFRASTRUCTURE**			
Strategy Direction: Provide a safe, continuous and convenient bicycle network.				
4.1	Implement augmentation of the bicycle network in accordance with the Works Program shown in Appendix 4.	*NSW BikePlan* actions 2.2, 2.16, 2.17. In progress. Some high priority works included in *Delivery Program 2011/2012 – 2014/2015 and Operational Plan 2011/12*. Project funding to be determined in preparation of future operational plans.	IMS, PRS Ongoing	RMS
4.2	Develop a priority rating system to assist in prioritising future infrastructure works.	Operational	IMS, PRS High	CWP
4.3	Undertake a full audit of existing infrastructure. Audit to include items such as lane and path widths, pavement markings and signage, route connectivity, bollards, drainage grates, intersection treatments, conflict points, end of trip and mid-trip facilities, etc. Identified works to be included in the Works Program.	In progress.	IMS, PRS High	
4.4	Identify and investigate locations where there is conflict between motor vehicles, cyclists, pedestrians and other users, and develop solutions.	Specific locations to be identified through audit process. Operational	IMS, PRS High	RMS
4.5	Prior to implementation of scheduled road surfacing, relinemarking or reconstruction projects on roads, Council and the RMS undertake an assessment of provisions for cyclists and determine capacity for upgrading of facilities (such as reallocation of space, linemarking, physical separation of cyclists and motorists).	*NSW BikePlan* action 2.19. Action statement is consistent with RMS policy. Operational	RAMS, IMS High	RMS

REF.	ACTIONS	COMMENT, RESOURCES	RESPONSIBLE SERVICE UNIT, PRIORITY	STAKEHOLDERS
4.6	Ongoing development and installation of directional and destination signage in accordance with relevant standards, that is clear, consistent and does not result in unnecessary clutter.	Funding allocation for development of a suite of route signage included in the *Management Plan 2010/2011* and the *Delivery Program 2011/2012 – 2014/2015 and Operational Plan 2011/2012*. Ongoing funding required.	IMS, PRS High	RMS
4.7	Negotiate level of service agreements for ongoing maintenance and asset management of cycling infrastructure.	Maintenance is currently carried out in accordance with the *City Wide Maintenance Policy 2008*. Operational	IMS, PRS, RAMS High	RMS
4.8	Investigate web based system for reporting of required maintenance.	*NSW BikePlan* action 2.12. Operational	CSCCS, RAMS Medium	RMS
4.9	Investigate feasibility of physically separated bike lanes, from Newcastle Showground to Newcastle East.	Investigation of inner city bike lanes initiated. Funding allocated.	SPS High	
4.10	Review road speeds for the current and proposed bike network.	*NSW BikePlan* action 2.8. RMS approval required for speed changes. Operational	IMS Medium	RMS
4.11	When road works and local area traffic management schemes are undertaken, examine opportunities to increase priority for cyclists and pedestrians.	Operational	IMS Ongoing	
Strategy Direction: Enhance support infrastructure, such as end of trip facilities.				
4.12	Undertake audit and mapping of bicycle parking.	Audit to include note of type, location, condition, number of facilities etc. Audit commenced. Operational	IMS Medium	
4.13	Consider opportunities to create and develop rest points along routes, and provide bike parking, seating and drinking fountains at these points.	Adequacy of rest points to be assessed as part of audit. Where appropriate, list for future project funding for implementation.	IMS, PRS Medium	

REF.	ACTIONS	COMMENT, RESOURCES	RESPONSIBLE SERVICE UNIT, PRIORITY	STAKEHOLDERS
4.14	Investigate town centre public bike share or rental schemes and their feasibility for Newcastle.	*NSW BikePlan* action 2.11. Preliminary investigations could be undertaken within operational budgets.	SPS Low	RMS
5.	**PROMOTION AND EDUCATION**			
Strategic Direction: Promote cycling, special events and bike routes through a variety of media.				
5.1	Review and enhance cycling information on Council's web site (www.newcastle.nsw.gov.au/discover_newcastle/local_walks/cycling_in_newcastle). Include information on main cycle routes, information on health, environmental and social benefits of cycling, cycling events and links to other resources.	Improve cross-referencing and currency of information. Operational	SPS, IMS, PRS, CSCCS Ongoing	
5.2	Target key destinations and user groups (including tourists, recreational, University students) and develop specific 'cycling access guides'. Consider publication as brochures or on the web.	Partner with organisations/user groups to produce material. Project funding required for printing.	SPS, CSCCS, PRS Medium	UoN
5.3	Promote and sponsor events including 'National Ride to Work Day', 'Ride 2 School Day' and 'NSW Bike Week'. Promote staff participation in events such as 'National Ride to Work Day'.	*NSW BikePlan* action 2.5. Several events and programs are currently sponsored, including NSW Bike Week. Promotion could be undertaken through Council's web site at low cost. Project funding required.	IMS, CSCCS, PRS Ongoing	RMS
5.4	Prepare detailed maps of cycleways in Newcastle for print and on-line publishing. Consider inclusion of maps on touch screens.	Project funding required for printing of maps.	SPS, IMS, PRS, IMS Ongoing	
5.5	Collaborate with Lower Hunter Councils and the RMS to produce an updated brochure of routes throughout the Lower Hunter.	Project funding required.	SPS, IMS, PRS Medium	Lower Hunter Councils, RMS

REF.	ACTIONS	COMMENT, RESOURCES	RESPONSIBLE SERVICE UNIT, PRIORITY	STAKEHOLDERS
5.6	Update information about off road shared pathways in future edits of the Lower Hunter Transport Guide.	Operational	SPS Ongoing	LHCTG
5.7	Identify and promote cycle tourism opportunities. Note recommendations of previous cycling tourism reports, as referenced in this document.		TEDS, PRS Medium	Lower Hunter Councils
5.8	Investigate potential for Council to conduct cycle skills courses for employees and residents. Courses could include cycle maintenance, buying a bike and cycling for beginners.	*NSW BikePlan* action 3.7. Investigate opportunities for grant funding of cycling courses and partnerships with other Councils or agencies. Operational funds for investigation only.	IMS, CSCCS Medium	RMS, UoN, Lower Hunter Councils
5.9	Publish and promote codes of behaviour for on road and shared facilities.	*NSW BikePlan* action 3.4.	IMS	RMS
5.10	Undertake a specific driver/cyclist awareness campaign.	*NSW BikePlan* action 3.13.	IMS, CSCCS Medium	RMS
5.11	Investigate support of a bike festival in conjunction with local non government organisations. This could include a road race, stunt performance, mass participation cycling, bicycle themed art works and film festival.	Bicycle culture is synergistic with bicycle use. Funding required for implementation.	TEDS Low	CWP
6.	**LEADERSHIP AND ADVOCACY**			
Strategic Direction: Encourage and support cycling as a mode of transport for Council staff.				
6.1	Update Council policies to facilitate greater bicycle use for staff, including modification of the *Leaseback Vehicle Policy* to include alternatives to car lease.	Operational	HRS, ELT High	
6.2	Promote the availability of bikes for use by Council staff during office hours.	OHS issues to be addressed. Operational	ECCS Ongoing	

REF.	ACTIONS	COMMENT, RESOURCES	RESPONSIBLE SERVICE UNIT, PRIORITY	STAKEHOLDERS
6.3	Prepare a green travel plan for Council staff. Consider inclusion of an incentive program for employees who ride to work.	Operational	SPS Medium	
6.4	Investigate the potential to refurbish Council offices/premises to include additional facilities for bike storage, change rooms and showers.	Funding required for implementation.	SPFMS, CES Medium	
6.5	Ascertain interest in establishing a Council staff Bicycle User Group.	Operational	CSCCS Medium	
6.6	Provide visitor bike parking details for Council premises, such as the City Administration Centre, on Council's web site.	Operational	CSCCS Medium	
Strategic Direction: Foster staff development.				
6.7	Support training courses and workshop participation for Council staff involved in road planning, design, development assessment and maintenance, to increase awareness and understanding of needs and standards for cyclists.	Staff involved in design, approval and maintenance areas have undertaken training courses and attended conferences. This is to continue. Operational	HRS, ELT Ongoing	
Strategic Direction: Advocate for improved bicycle accommodation on public transport and measures to support active transport.				
6.8	Advocate to TfNSW and Newcastle Buses & Ferries to modify buses to allow carriage of bikes.	Operational	SPS Ongoing	Newcastle Buses & Ferries, TfNSW
6.9	Advocate to RailCorp to allow for greater provisions for cyclists on trains, including the carriage of bikes on trains without charge, and for secure storage facilities at stations.	Operational	SPS High	RailCorp, TfNSW
6.10	Advocate to the Federal Government for changes in the tax system to promote active transport and public transport use.	Operational	SPS Ongoing	Federal Government

REF.	ACTIONS	COMMENT, RESOURCES	RESPONSIBLE SERVICE UNIT, PRIORITY	STAKEHOLDERS
6.11	Advocate for inclusion of a cycling component in regional transport strategy documents, including identification of bike park and ride nodes and provision of facilities at these nodes.	TfNSW is currently preparing a long term transport master plan for NSW. Operational	SPS Ongoing	TfNSW
6.12	Advocate to TfNSW for comprehensive presentation of HTS data and cycling statistics for the Newcastle SSD (Lower Hunter Region), as is undertaken for the Sydney SD.	Operational	SPS Ongoing	TfNSW, BTS
6.13	Liaise with NSW Police to establish direct reporting of detailed information on bicycle crashes. Identify danger spots.	Purpose is to monitor safety as bicycle use increases. Operational	IMS	RMS, NSW Police
6.14	Liaise with the private sector to encourage delivery of adequate cycling support infrastructure.	Requirements for bike parking and end of trip facilities in new development are set by the NDCP. Council's role in retrofitting of facilities in the private domain is generally limited to advocacy. Operational	SPS Ongoing	Private sector
7.	**PLANNING FOR ACTIVE TRANSPORT**			
Strategic Direction: Facilitate active transport in new development.				
7.1	Ensure major new development is required to prepare green travel plans in accordance with the NDCP.	Requirement for green travel plans is included in NDCP. Operational	DBS Ongoing	
7.2	Require provision of end of trip facilities including bicycle parking in accordance with the NDCP.	Requirements for bike parking, lockers and showers for new development are listed in *Element 4.01 Parking and Access* of the NDCP 2005 (*Section 7.03 Traffic, Parking and Access* of NDCP 2012). Operational	DBS Ongoing	
7.3	Update list of cycling infrastructure projects in Council's section 94A and section 94 contributions	Review of section 94 contributions plans initiated.	SPS	

REF.	ACTIONS	COMMENT, RESOURCES	RESPONSIBLE SERVICE UNIT, PRIORITY	STAKEHOLDERS
	plans.	Project funding allocated.	High	
7.4	Ensure shared pedestrian and cycle paths and routes are provided for new development areas in accordance with the NDCP and the *Newcastle Cycling Strategy and Action Plan*. Ensure connectivity to regional and local routes.	Operational	DBS Ongoing	
7.5	Ensure provision of cycling routes and infrastructure is considered in preparation of locality based development control plans and area plans.	Operational	SPS Ongoing	
7.6	Ensure *Planning Guidelines for Walking and Cycling* (DIPNR, 2004) and PCAL's *Development and Active Living Resource* www.pcal.nsw.gov.au/__data/assets/pdf_file/0007/99943/PCAL_Final_web-v1_6.pdf are considered when new LEPs, DCP elements, development contribution plans and masterplans are prepared.	*NSW BikePlan* action 4.2. Operational	SPS Ongoing	
7.7	Ensure future proposed cycle paths are reserved. Investigate listing proposed bike routes on section 149 certificates.	Local and regional routes are to be considered. Operational	SPS, Information Management Services Medium	
7.8	Investigate viability of a public cycling facility in the Newcastle City Centre which includes showers, change facilities, and lockers close to groupings of major employers.		SPS Low	Private sector, UoN
8.	**MONITORING AND REVIEW**			
Strategic Direction: Develop measures to monitor implementation of actions and progress towards nominated targets.				
8.1	Determine key locations to monitor trends in bike use and implement a program of cycle data	*NSW BikePlan* actions 6.7 - 6.11.	IMS, SPS	CWP, NCM

REF.	ACTIONS	COMMENT, RESOURCES	RESPONSIBLE SERVICE UNIT, PRIORITY	STAKEHOLDERS
	collection at nominated points. Investigate options for data collection, including volunteers, partnerships.	Funding required to undertake counts.	High	
8.2	Implement bicycle counts as standard practice, whenever traffic and pedestrian counts are undertaken.	Operational	IMS Ongoing	RMS
8.3	Participate in 'Super Tuesday' bicycle count (as organised by Bicycle Network Victoria and undertaken in March each year).	Participation involves costs of approximately $4000. Costs can be accommodated within operational funds.	SPS, IMS Ongoing	Bicycle Network Victoria
8.4	Request BTS to provide mode share details for trips of 0-2km, 2-10km and greater than 10km, to track progress against *NSW 2021* and *NSW BikePlan* targets.	Customised requests to the BTS incur costs, however these can be accommodated within operational budgets. Data to be requested on a yearly basis in line with HTS release.	SPS Ongoing	BTS
8.5	Undertake a staff travel survey on a yearly basis.	Operational	SPS, CSCCS Medium	
8.6	Liaise with major employers in Newcastle to encourage survey of staff travel patterns, to supplement mode share data.	Operational	SPS	UoN, HNEH
8.7	Survey residents on cycling participation, attitudes etc. through yearly Newcastle Voice survey. Differentiate between cycling for utilitarian and recreational/sporting purposes.	Operational	CSCCS Ongoing	
8.8	Prepare a summary statement of actions completed by Council, on implementation of the *Newcastle Cycling Strategy and Action Plan*, on a two-yearly basis as part of the proposed bicycle account.	Operational	SPS	CWP
8.9	Prepare a bicycle account every two years. Establish the basic form of the bicycle account, covering cycling patronage on specific routes, mode	Preparation of the document can be undertaken with existing resources however funding is required to collect data (refer to Action 8.1).	SPS High	CWP

REF.	ACTIONS	COMMENT, RESOURCES	RESPONSIBLE SERVICE UNIT, PRIORITY	STAKEHOLDERS
	share, cycling infrastructure, injury data, and the monitoring regime and sources required to inform the account, by June 2012.			
8.10	Undertake a review of the *Newcastle Cycling Strategy and Action Plan* approximately five years after its adoption.	Operational	SPS Medium	CWP

1. Introduction

The Newcastle 2030 process established a vision for the City of Newcastle:

> In 2030 Newcastle will be a Smart, Liveable and Sustainable City. We will celebrate our unique city and protect our natural assets. We will build resilience in the face of future challenges and encourage innovation and creativity. As an inclusive community, we will embrace new residents and foster a culture of care. We will be a leading lifestyle city with vibrant public places, connected transport networks and a distinctive built environment. And as we make our way toward 2030, we will achieve all this within a framework of open and collaborative leadership.

The Newcastle 2030 process highlighted the community's desire for convenient, connected transport networks and services and a city in which walking, cycling and public transport are viable options for getting around.

The *Newcastle Cycling Strategy and Action Plan* represents Council's commitment to enhancement of cycling in Newcastle. It builds on earlier bike plans and strategies of Council, and is intended as the key document to direct Council's future spending on cycling related infrastructure works and programs.

Section 2 of this document describes the context for cycling in Newcastle. It presents a summary of the recognised benefits of cycling; the current policy framework and data on current levels of participation. A summary of relevant documents at a Federal, State and local level, which provide context for this document, is included at Appendix 1.

Section 3 outlines the key objectives and targets of the *Newcastle Cycling Strategy and Action Plan*. The specific actions to address the objectives are listed in the subsequent sections, with some discussion of the impetus for the proposed actions.

Section 4 lists actions related to the bicycle network and infrastructure. It defines the network to be delivered by Council, in partnership with other agencies, over the long term. Appendices 2, 3, 4 and 5 provide detail relevant to this section, and cover route descriptions, maps, proposed works and indicative route treatments respectively.

Sections 5, 6 and 7 describe the proposed actions relating to promotion and education; leadership and advocacy, and planning for cycling in new development respectively.

As discussed in later sections, Council lacks data to accurately define current levels of participation in cycling generally, and patronage of particular routes. Section 8 outlines a framework for monitoring trends, implementation of actions and progress towards nominated targets. Section 9 discusses funding sources for future works and the roles of units within Council's organisational structure in contributing to improvements in the cycling environment.

2. Cycling in Newcastle - Context

2.1 Snapshot

Newcastle is located at the mouth of the Hunter River, approximately 160km north of Sydney and is the economic, administrative and cultural centre of the Hunter Region. The city, which has a population of approximately 156,112 (Australian Bureau of Statistics, 2011), is part of the Newcastle SSD, which includes the local government areas of Cessnock, Maitland, Lake Macquarie, Newcastle and Port Stephens.

The city has a diverse natural environment, from coastal headlands and beaches to wetlands, mangrove forests, steep ridges and rainforest gullies. Much of the city is relatively flat, lending it to trips by bike.

Land use in Newcastle and the Lower Hunter generally is characterised by relatively low housing density and a low level of concentration of employment, education, community and recreation facilities. The Newcastle City Centre's dominance of the region's commercial and retail activities has declined as suburban centres such as Kotara and Glendale/Cardiff and Charlestown, in the Lake Macquarie LGA, have developed. However, the City Centre still represents one of the highest concentrations of jobs in the region and with its extensive harbour foreshore open spaces and coastal beaches will remain a major destination. Many major regional facilities or attractions, and therefore transport generators, are found in dispersed parts of the city. These include the John Hunter Hospital and the University of Newcastle, the city's two largest single employers.

The inner and middle ring suburbs of Newcastle, such as Maryville and Adamstown, have significantly higher population densities than new release areas in the western corridor. Similarly, patterns of car ownership vary throughout the LGA, with vehicles per dwelling significantly higher west of Wallsend than the inner suburbs. It is telling that with a population of 146,000 in 1971, the number of vehicles was 44,627 but by 2006, in spite of a decrease in population, vehicle ownership had soared to 75,616.

2.2 Benefits of Cycling

Various environmental, health, economic and social benefits are associated with greater bicycle use. Benefits accrue to the individual and the wider community.

2.2.1 Environment

Cycling has a low impact upon the environment and can help to reduce dependence on fossil fuels. Transport emissions account for 15% of the total greenhouse emissions in NSW, with cars accounting for nearly half of this (NSW Greenhouse Office, 2005, p. 47). Cycling does not emit greenhouse gases or other pollution, and an increased use of bicycles can contribute to national goals to reduce our dependence on non-renewable fossil fuels. Cars emit a range of pollutants damaging to the environment including nitrogen, carbon dioxide, volatile organic compounds and other particulates and require much more space. Compare the size of a cycleway to the width of a normal street and the room required to park a car versus that for a bike. Cycling provides a viable and sustainable transport option compared to cars.

2.2.2 Health

It has been identified that only half the NSW population does the recommended 30 minutes of moderate intensity physical activity each day which is required to maintain good health (NSW Department of Health, 2005). Reduced physically activity is associated with a range of physical and mental health problems.

Cycling is a great way to achieve the required 30 minutes of moderate physical activity required each day. A 30 minute bike ride a day can halve your risk of obesity and diabetes and can reduce risk associated with heart diseases, cancer and stroke (World Health Organisation, 2000). Cycling is a low impact form of exercise and causes less strain and injuries than some other forms of exercise. It is a great way to improve aerobic conditioning, build muscle strength and endurance and have fun at the same time. Cycling can also be easily incorporated into daily routine.

2.2.3 Economic

The costs of owning and running a car are substantial. Taking into account fuel, parking, depreciation, maintenance, registration and insurance, costs can easily exceed several hundred dollars per week[1]. The costs of owning and operating a bicycle are a fraction of this. Even if all trips are not made by cycling, substantial individual savings can be made.

Walking and cycling can cut journey travel time, when time wasted due to congestion and parking is taken into account. It can also save time at the gym by incorporating physical activity into daily transport. It has been estimated that congestion costs Australia approximately $9.4 billion per year, made up of private time costs, business time costs, extra vehicle operating costs, and in extra air pollution damage costs (Bureau of Transport and Regional Economics, 2007, p. 11).

It is estimated that the direct health care costs of physical inactivity are well over $400 million nationally a year and that the indirect costs, such as time off work, would more than double this (Australian Chronic Disease Prevention Alliance, 2004).

Encouraging cycling potentially helps defer public expenditure on new road and car parking facilities. A recent study undertaken by the City of Sydney indicates that relative to doing nothing, the development of the Inner Sydney Regional Bicycle Network is estimated to generate net economic benefits of $507 million in today's prices at a benefit cost ratio of 3.88 (AECOM, 2010, p. vi). In its appraisal the following benefit streams were evaluated: decongestion; vehicle operating costs savings; parking cost savings; travel time savings; journey ambience; health benefits in the form of reduced mortality and absenteeism savings; accident costs; reduced air pollution; reduced noise pollution; greenhouse gas reduction; reduced water pollution; reduced urban separation; and reduced pressure on government infrastructure and services (AECOM, 2010, pp v, vi).

2.2.4 Social

Increased cycling can help reduce traffic flows in residential areas, improving the amenity and liveability for residents. Providing for cycling improves access for those in the community who do not have alternative forms of transport readily available or do not want to use cars. Cycling makes it easier to interact with others and the environment. People travelling by bike often stop for a chat or to shop locally - opportunities that build social cohesiveness and are unavailable when driving. More people walking and cycling also translates to increased passive surveillance, with positive implications for community safety.

2.3 Bicycle Usage

2.3.1 Data sources

Collection and analysis of cycling data for Newcastle provides a basis for the formulation of strategic directions. There is a range of data sources which cover cycling throughout Newcastle, NSW and Australia, including Australian Bureau of Statistics journey to work data, the Bureau of Transport Statistics Household Travel Survey and reports and statistics from Roads and Maritime Services (formerly the Roads and Traffic Authority). The information

[1] Refer to http://www.mynrma.com.au/motoring/buy-sell/buying-advice/car-operating-costs/about-car-operating-costs.htm for further information on operating costs.

available from these sources is limited, and does not present a detailed picture of bike riding in the city. Information on recreational cycling is particularly limited.

Journey to work census data is a reliable source of trend information over the long term. However, the journey to work, or commute, is typically the fourth highest trip purpose for residents of the Lower Hunter, representing around 12% of all trips (Ministry of Transport, 2007). The Household Travel Survey[2] is, as detailed on the web site of the Bureau of Transport Statistics, the largest and most comprehensive source of personal travel data for the Sydney Greater Metropolitan Area, however, the reports published on the Bureau of Transport Statistics web site are focussed on the Sydney SD, with the most recent summary for the Newcastle SSD (which includes the LGAs of Cessnock, Lake Macquarie, Maitland, Newcastle and Port Stephens) being the 2007 release *TransFigures – Travel in Sydney, Newcastle and Illawarra* (Ministry of Transport, 2007). This publication details mode of travel, as vehicle driver, vehicle passenger, train, bus, walk only and other – it does not distinguish trips by bike. Requests can be made to the Bureau of Transport Statistics to interrogate the Household Travel Survey data for specific information.

The document *Cycling in New South Wales: What the data tells us* (Parsons Brinckerhoff Australia Pty Limited, 2008) gives an overview of cycling across NSW, and a base to compare statistics relating to Newcastle. The following sections include data from this source for comparative purposes.

Council has some participation figures undertaken for specific projects, but has not, to date, undertaken regular counts on bike routes to build up a picture over the longer term of bike riding trends. In order to supplement the above data with information specific to Newcastle a questionnaire was conducted through Newcastle Voice[3]. Consultation was conducted with the community to gather insight from both cyclists and non-cyclists, to assist in understanding trends, enabling factors, barriers to participation and safety enhancement needs, to inform development of this document. The survey had a 44% completion rate (784 out of 1776). The strength of community opinion for this subject is reflected in the volume and quality of responses received. The full report of the survey, *Cycling in Newcastle,* is available at http://www.newcastle.nsw.gov.au/__data/assets/pdf_file/0006/116718/Report_-_Cycle-_Final_with_Appendix.pdf.

2.3.2 Trip patterns

Information was sought from the Bureau of Transport Statistics to supplement data available from web publications. Pooled data from the Household Travel Survey weighted to 2009 population was used to produce Tables 1 to 4, which show mode share of trips on an average weekday, trip distance by mode and average trip distance by mode for an average weekday and average weekend day. Key points from the data are:

- The use of bikes as a mode of transport for all trips is very low, at approximately 1.6% of trips for the Newcastle LGA and 1% for the Newcastle SSD (Lower Hunter).
- On an average weekday, almost 40% of all trips in Newcastle are less than 2km.
- Approximately 87% of trips in Newcastle are less than 10km.
- The average trip distance on a weekday is 5.7km for Newcastle, compared to 9.1km for the Lower Hunter.
- The average trip distance for a weekend day is 7.5km for Newcastle and 10.7km for the Lower Hunter.

[2] Refer to http://www.bts.nsw.gov.au/hts/default.aspx for further information.

[3] Newcastle Voice is a community reference panel. Refer to http://www.newcastle.nsw.gov.au/council/community_consultation/newcastle_voice for further information.

Given the average trip distance, it is feasible for a much greater proportion of these to be undertaken using active transport such as walking and cycling.

Children are becoming used to motorised trips from an early age. Data extracted from the HTS and used to determine the mode of transport used by children to get to and from school shows that for children five to nine years, walking trips dropped from approximately 57.7% to 25.5% and car trips increased from 25.5% to 66.6% between 1971 and 2003 (van der Ploeg H.P et al, 2008). Similar changes were found for children ten to fourteen.

	Cessnock	Lake Macquarie	Maitland	Newcastle	Port Stephens	Newcastle SSD
Vehicle Driver	59.7%	58.4%	58.4%	54.3%	62.1%	57.8%
Vehicle Passenger	20.9%	24.9%	25.5%	22.7%	23.5%	23.8%
Train	0.6%	0.9%	1.1%	0.3%	0.1%	0.7%
Bus	5.7%	3.6%	2.5%	3.2%	3.3%	3.5%
Walk only[(a)]	10.3%	10.5%	11.3%	16.9%	10.0%	12.3%
Bicycle	1.9%	0.8%	0.7%	1.6%	0.4%	1.0%
Other	0.9%	0.9%	0.6%	1.1%	0.6%	0.9%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 1: Mode share of trips for residents of Newcastle SSD LGAs, average weekday, HTS 2009
(a) Walk link trips have been excluded
Source: (BTS, personal communication, 2011)

	<= 2.00 km	2.01 km - 10.00 km	10.01km +
Vehicle Driver	28.1%	55.0%	16.9%
Vehicle Passenger	29.9%	57.8%	12.3%
Train	9.0%	62.3%	28.7%
Bus	18.7%	69.1%	12.2%
Walk only	92.4%	7.6%	0.0%
Bicycle	43.8%	48.2%	8.0%
Other	59.7%	28.2%	12.1%
Total	39.7%	47.7%	12.7%

Table 2: Trip distance by mode for residents of Newcastle LGA, average weekday, HTS 2009
Source: (BTS, personal communication, 2011)

	<= 2.00 km	2.01 km - 10.00 km	10.01km +
Vehicle Driver	30.3%	51.0%	18.6%
Vehicle Passenger	29.5%	52.1%	18.4%
Train	0.0%	26.4%	73.6%
Bus	19.7%	66.7%	13.7%
Walk only	89.5%	10.5%	0.0%
Bicycle	53.7%	46.3%	0.0%
Other	34.5%	65.5%	0.0%
Total	40.3%	44.6%	15.1%

Table 3: Trip distance by mode for residents of Newcastle LGA, average weekend day, HTS 2009
Source: (BTS, personal communication, 2011)

	Average weekday		Average weekend day	
	Newcastle	Newcastle SSD	Newcastle	Newcastle SSD
	Average distance (km)	Average distance (km)	Average distance (km)	Average distance (km)
Vehicle Driver	7.17	10.60	8.40	10.73
Vehicle Passenger	5.78	9.16	8.74	13.10
Train	17.03	49.40	85.88	60.16
Bus	5.47	8.24	8.40	7.42
Walk only	0.81	0.89	0.97	1.04
Bicycle	3.59	3.58	3.20	3.47
Other	6.40	5.22	3.65	21.96
Total	5.69	9.10	7.52	10.75

Table 4: Average trip distance by mode for residents of Newcastle LGA and the Newcastle SSD, average weekday and average weekend day, HTS 2009
Source: (BTS, personal communication, 2011)

2.3.3 Travel to work

Bicycle trips are undertaken for many purposes, however, the journey to work is perhaps the best documented. Due to the demand it places on transport systems, and the concentrated periods in which that demand occurs, it is also of primary interest to transport and traffic planners in cities. Increase in mode share of the commute to bikes and other sustainable transport modes, and corresponding reduction in mode share to cars is not only a primary aim of Council's key strategic documents, and desirable in terms of environmental benefits – it is a necessary condition for such constrained areas as the Newcastle City Centre, if proposed future development is to be accommodated.

Table 5 shows the trips, by mode and sex, for each of the three SLAs in Newcastle – Inner City, Throsby and Outer West for the journey to work on census day in August 2006. The car is by far the dominant mode of transport for commuting trips. Newcastle recorded 1042 'bicycle only' journey to work trips, which represents 2.04% of trips. Comparison with earlier census data indicates a slight decline in the proportion of proportion of cyclists riding to work in Newcastle from 2001 (2.25%) to 2006 (2.04%). There is substantial variation between the three SLAs, with Inner City having the highest rate of cycling. Within this SLA, there is considerable variation by suburb. For example, the suburbs of Mayfield, Carrington, Newcastle East and Newcastle West are part of the Inner City SLA. The mode share to cycling for these suburbs are 2.27%, 4.54%, 3.63% and 3.43% respectively.

Table 5 shows marked differences in the numbers of men and women cycling to work. Men comprise the larger share of commuter cyclists, with women representing 16% of commuter cyclists in the Newcastle LGA. This is consistent with data across NSW.

Method of Travel to Work by Sex

	Inner City			Throsby			Outer West			Newcastle LGA		
	Males	Females	Persons	Males	Females	Persons	Males	Females	Persons	Males	Females	Persons
One method:												
Train	113	70	183	108	63	171	36	40	76	256	172	428
Bus	231	302	533	249	339	588	122	172	294	601	815	1,416
Ferry	18	39	57	4	3	7	0	0	0	20	42	62
Tram (includes light rail)	3	0	3	0	0	0	0	0	0	4	0	4
Taxi	32	39	71	28	20	48	15	7	22	77	67	144
Car, as driver	7,185	6,036	13,221	7,660	6,499	14,159	6,644	5,126	11,770	21,485	17,664	39,149
Car, as passenger	612	671	1,283	636	795	1,431	577	569	1,146	1,836	2,029	3,865
Truck	161	5	166	249	0	249	246	0	246	653	11	664
Motorbike/scooter	138	26	164	153	25	178	133	5	138	427	56	483
Bicycle	399	87	486	366	70	436	111	14	125	874	168	1,042
Other	52	18	70	46	19	65	33	12	45	127	48	175
Walked only	708	836	1,544	458	450	908	204	194	398	1,369	1,478	2,847
Total one method	*9,652*	*8,129*	*17,781*	*9,957*	*8,283*	*18,240*	*8,121*	*6,139*	*14,260*	*27,729*	*22,550*	*50,279*
Two methods:												
Train and:												
Bus	13	11	24	5	0	5	5	3	8	24	15	39
Ferry	3	3	6	0	0	0	0	0	0	8	3	11
Tram (includes light rail)	0	0	0	0	0	0	0	0	0	0	0	0
Car, as driver	12	5	17	9	7	16	10	3	13	33	18	51
Car, as passenger	14	4	18	5	6	11	3	3	6	18	13	31
Other	14	9	23	11	5	16	4	3	7	30	14	44
Total	56	32	88	30	18	48	22	12	34	113	63	176
Bus and:												
Ferry	11	13	24	0	0	0	0	0	0	10	18	28
Tram (includes light rail)	0	0	0	0	0	0	0	0	0	0	0	0
Car, as driver	5	4	9	11	12	23	3	5	8	18	20	38

Method of Travel to Work by Sex

	Inner City			Throsby			Outer West			Newcastle LGA		
	Males	Females	Persons	Males	Females	Persons	Males	Females	Persons	Males	Females	Persons
Car, as passenger	8	14	22	15	20	35	7	15	22	28	52	80
Other	7	5	12	4	10	14	0	5	5	11	15	26
Total	31	36	67	30	42	72	10	25	35	67	105	172
Other two methods	98	47	145	64	41	105	64	24	88	227	109	336
Total two methods	*185*	*115*	*300*	*124*	*101*	*225*	*96*	*61*	*157*	*407*	*277*	*684*
Three methods:												
Train and two other methods	11	4	15	7	6	13	6	3	9	26	11	37
Bus and two other methods (excludes train)	7	3	10	5	5	10	3	3	6	12	9	21
Other three methods	11	0	11	5	0	5	5	0	5	26	0	26
Total three methods	*29*	*7*	*36*	*17*	*11*	*28*	*14*	*6*	*20*	*64*	*20*	*84*
Worked at home	309	405	714	305	392	697	177	260	437	789	1,056	1,845
Did not go to work	1,160	1,769	2,929	1,149	1,919	3,068	1,005	1,522	2,527	3,312	5,212	8,524
Method of travel to work not stated	175	162	337	173	174	347	179	147	326	526	484	1,010
Total	**11,510**	**10,587**	**22,097**	**11,725**	**10,880**	**22,605**	**9,592**	**8,135**	**17,727**	**32,827**	**29,599**	**62,426**

Table 5: Method of Travel to Work by Sex

Source: 2006 Census of Population and Housing, Method of Travel to Work by Sex. Count of employed persons aged 15 years and over. Based on place of usual residence.

2.3.4 Comparison with other cities

Cycling in New South Wales: What the data tells us (Parsons Brinckerhoff Australia Pty Limited, 2008) indicates that Newcastle at 2.04% has a higher than average rate of cycling than the rest of NSW for the journey to work. Bicycle-only trips accounted for less than 0.8% of NSW journey to work trips on census day in August 2006 (p. 19). LGAs with the highest level of cycling to work in NSW are in inner Sydney and Newcastle (Parsons Brinckerhoff Australia Pty Limited, 2008, p. 20).

As indicated in Figure 1, when compared to other Australian cities Newcastle has higher than average journey to work trips made by bicycle. The relatively high rate for Darwin may be due in part to the terrain and the legal framework, which permits cycling on footpaths. Compared to the world's leading cycling cities, Newcastle (with all Australian cities) has a low mode share of bicycle trips. For instance in Copenhagen 34% of trips to work are made by bicycle, and 37% of all journey to work trips in Amsterdam are made by bicycle (Parsons Brinckerhoff Australia Pty Limited, 2008, p. 33).

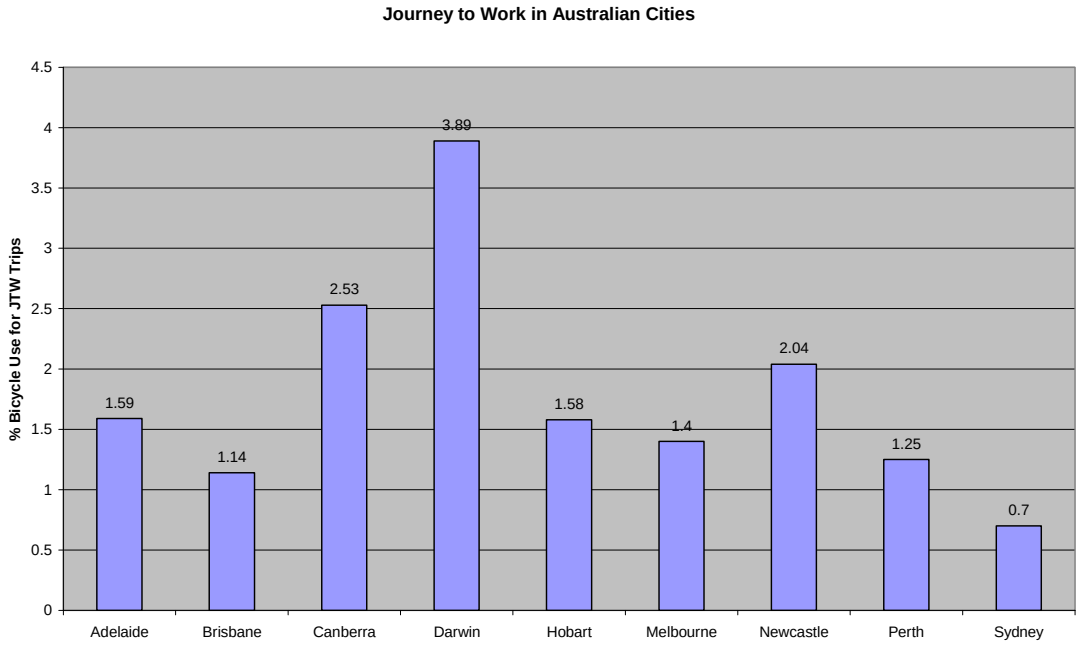


Figure 1: Comparison of journey to work trips made by bike only in various Australian cities
Souce: Data derived from *Cycling in New South Wales: What the data tells us* (Parsons Brinkerhoff Australia, Pty Limited, 2008, p. 35)

2.3.5 Council staff walking and cycling trips

A survey of staff travel patterns was last undertaken in 2005. Responses from staff totalled 42% (224 out of 528). The modal split figures for trips to and from work by staff surveyed showed 55% drove to work by themselves; 11% car pooled; 16% used public transport and 18% walked or rode a bike.

2.3.6 Participation

According to the Newcastle Voice survey, almost half of respondents (44%) indicated that they rode their bike in the last week or month. 21% indicated that they ride several times a week for a variety of reasons, while 31% classed themselves as non-cyclists - they hardly ever, or never ride.

Almost half (49%) of respondents to the Newcastle Voice survey indicated that they cycle alone. Of those that cycle with others, there is a mix of people riding with young families and those riding with other adults.

2.3.7 Why do people cycle?

There are many factors that influence a person's decision to ride a bike. According to the Newcastle Voice survey, the top six reasons given for cycling are as follows:

- improve my personal health and fitness (85%)
- scenery/general recreation/leisure (65%)
- reduce my carbon footprint (38%)
- convenient, easy (including ease of parking) (31%)
- to go to work (29%) tied with shopping/errands.

2.3.8 Where and how far do people in Newcastle ride?

Over 27% of the Newcastle Voice survey respondents ride over 30km each week. This particular survey did not differentiate between trips undertaken for utilitarian purposes – cycling as mode of transport, and cycling for recreation or sport.

As part of the Newcastle Voice survey, a snapshot was sought for the most common cycling routes taken at present, out of a possible list of 20. The routes with strongest infrastructure elements emerged as first and second, followed by busy commuter routes:

- Throsby Creek/harbour foreshore
- Fernleigh Track
- The Junction to City Centre – via Union St
- Merewether to City Centre – via The Hill and Bar Beach
- Mayfield to City Centre – road route.

2.4 Safety and Crashes

Over 42% of Newcastle Voice respondents indicated that they felt 'unsafe' or 'extremely unsafe' when riding their bike. Bike riders felt the least safe when riding their bicycles along major roads, with 89% of respondents indicating they felt 'extremely unsafe' or 'unsafe'. Riding on backstreets, amongst cyclists and on the Fernleigh Track scored relatively similar scores from respondents as being 'extremely safe' or 'safe' – 64%, 67% and 66% respectively.

Nearly half (47%) of the Newcastle Voice respondents stated that they had been yelled at or abused by motorists within the last 12 months. When asked if they had ever been hit by an opening car door or had to swerve into traffic to avoid it, approximately 52% said they had. Almost 55% have had a near miss where they were almost hit by a vehicle while cycling in the last 12 months. Within the last five years, 13% have been injured in a collision with a vehicle while cycling. Of those respondents, only one sixth had reported the incident to police. It is generally recognised that a substantial proportion of non-fatal pedal cycle crashes are not reported to the police.

According to *Cycling in New South Wales: What the data tells us* (Parsons Brinckerhoff Australia Pty Limited, 2008, p. 26), the 1193 crashes involving cyclists in NSW in 2006 mainly occurred during daylight hours. Across NSW, of the 144 crashes that were reported occurring during daylight hours on a Tuesday:

- 59% occurred at intersections
- 41% occurred at mid-block locations
- 14% occurred on footpaths, cycleways in the road reserve or the nature strip

- 13% occurred at driveways
- 8% occurred in bus lanes.

Cycling in New South Wales: What the data tells us (Parsons Brinckerhoff Australia Pty Limited, 2008, p. 28) shows that approximately 5% of pedal cycle crashes involved the cyclist hitting a parked car with an open driver's side door.

From 2006 – 2008, there were 1693 road crashes in Newcastle, of which 188 (11%) were pedal cycle crashes. Across the Hunter for the same period, there were 8102 road crashes, of which 487 (6%) involved pedal cyclists.

Notwithstanding the many benefits of cycling, the perception of cycling as being unsafe is a major deterrent to increased participation. Through the Newcastle Voice survey, it was clear that safer infrastructure is part of the solution, but greater acceptance of cyclists' right to share the road and awareness of cyclists by drivers is critical.

2.5 Federal, State and Local Framework

The development of a local cycling strategy and action plan is supported by a framework of Federal and State Government documents that seek to promote cycling. Council also has a range of documents that recognise cycling issues and seek to promote cycling activity in the area. This document consolidates and builds on these current programs, strategies and actions, in the context of the policies and initiatives at State and Federal levels of government. A list of key documents and the relevant strategies, actions or guidelines, are shown in Appendix 1 and include *The Australian National Cycling Strategy 2011 – 2016* (Austroads, 2010), the *NSW BikePlan* (NSW Government, 2010) and *Newcastle 2030 - Newcastle Community Strategic Plan* (The City of Newcastle, 2011).

2.5.1 The Australian National Cycling Strategy 2011 – 2016

The overarching vision of *The Australian National Cycling Strategy 2011-2016* is to realise a step-change in attitudes to cycling and in the numbers of riders in Australia. In the short term, the goal is to double the number of people riding by 2016. *The Australian National Cycling Strategy 2011-2016* sets out a framework of six key priorities and objectives, as listed below.

- Cycling Promotion – Promote cycling as both a viable and safe mode of transport and an enjoyable recreational activity
- Infrastructure and Facilities – Create a comprehensive network of safe and attractive routes to cycle and end of trip facilities
- Integrated Planning – Consider and address cycle needs in all relevant transport and land use planning activities
- Safety – Enable people to cycle safely
- Monitoring and Evaluation – Improve monitoring and evaluation of cycling programs and develop a national decision-making process for investment in cycling
- Guidance and Best Practice – Develop nationally consistent technical guidance for stakeholders to use and share best practice across jurisdiction.

These key priorities have generic actions that can be applied within states, territories and local governments in accordance with community aspirations, priorities and available resources.

Australian Cycling Participation (Austroads Ltd, 2011b), establishes a baseline against which to measure progress towards the target. It indicated that NSW has the lowest participation in cycling of all states and territories.

2.5.2 NSW BikePlan

The *NSW BikePlan* is a whole-of-government initiative overseen by the Premier's Council for Active Living. The *NSW BikePlan* is about promoting cycling as a means of transport for everyday use and encouraging people to ride more often and more safely. The NSW Government, through the *NSW BikePlan* aims to:

- increase the share of short trips by bike in Greater Sydney for all travel purposes to 5% by 2016
- double the use of cycling to get to work across NSW as a whole, between 2006 and 2016.

The document details the delivery of infrastructure projects for the next ten years, including:

- $78 million over 10 years to fast-track cycleway connections in Parramatta, Penrith and Liverpool
- $80 million over 10 years to build the key missing links in the Metro Sydney Bike Network
- at least $5 million each year to help local councils across NSW complete cycling networks.

2.5.3 Newcastle 2030 – Newcastle Community Strategic Plan

Newcastle 2030 - Newcastle Community Strategic Plan is a blueprint for a better Newcastle, reflecting the community's shared vision for a smart, liveable sustainable city. Seven key themes emerged from the engagement process – a connected city, a protected and enhanced environment, vibrant and activated public places, a caring and inclusive community, a liveable and distinctive built environment, a smart and innovative city, open and collaborative leadership. Responsibility for working towards the vision and implementing the strategies is shared by all levels of government, other agencies and the community.

Transport emerged as a major theme throughout the consultation process. The community indicated that they want a connected city, in which transport networks and services are well-connected and convenient, and walking, cycling and public transport are viable options for the majority of residents' trips. *A Shared Vision for Newcastle: Summary of community priorities* (http://www.newcastle.nsw.gov.au/__data/assets/pdf_file/0015/108060/A_Vision_for_Newcastle_summary_of_community_priorities_WEB_VER.pdf) outlines the community's aspirations in relation to cycling:

> The ability to walk and cycle safely on a dedicated and integrated network is important in supporting an active and healthy lifestyle. We want a highly inter-connected system of pedestrian and bicycle paths supported by appropriate 'end of trip' facilities and infrastructure on trains and buses for bikes (p. 6).

Safer bike paths, physically separated from traffic, good connectivity and integration of cycling with public transport are clear community priorities. The community's ideas for the future, as listed in the *Newcastle Community Strategic Plan*, include Copenhagen style bike lanes; City Centre cycleway along Hunter St or King St and use of rail corridors for parallel cycleways.

The objectives and strategies for the key strategic direction of *connected city* that specifically relate to cycling are listed below.

Objective 1.1	**Effective and integrated public transport**
	Strategies
1.1d	Promote the benefits of public transport, walking and cycling

Objective 1.2	**Linked networks of cycle and pedestrian paths**
	Strategies
1.2a	Develop a network of safe, linked cycle and pedestrian paths integrated with key destinations and green space
1.2b	Plan for cyclists and pedestrians in planning for new developments
1.2c	Give greater priority to cyclists and pedestrians in transport planning to enhance safety and encourage travel behaviour change
1.2d	Enhance support infrastructure such as end of trip facilities to encourage walking and cycling

Objective 1.3	**A transport network that encourages energy and resource efficiency**
	Strategies
1.3a	Manage and plan our transport networks to minimise congestion

2.5.4 Newcastle Recreation Plan

Council's adopted *Newcastle Recreation Plan 2006 - 2016* presents a summary of a series of five documents prepared by consultants @leisure with input from a Project Control Group and other stakeholders. A key result area was encouraging walking and cycling. This component stressed the importance of providing opportunities for non-structured recreation. Cycling elements within the *Newcastle Recreation Plan* (primarily recommendations for shared paths, promotion and information) have been incorporated in the *Newcastle Cycling Strategy and Action Plan*. Other suggested strategies included provision of paths of various grades and consideration of dedicated facilities for BMX and mountain biking. The implementation plan adopted by Council for the period to 2016 included advocacy to the NSW National Parks and Wildlife Service for a series of trails in Blue Gum Hills Regional Park. Mountain biking is primarily a recreational activity. The *Newcastle Recreation Plan* is scheduled for review in the short term and it is envisaged that this process will address mountain biking in more detail.

2.5.5 Previous Bike Plans

There have been two major bike planning studies undertaken for the Newcastle area: the *Newcastle Area Bike Plan 1981* and the *Newcastle Lake Macquarie Bike Plan 1996*. Progress has been made in the implementation of these plans cooperatively and individually by the City of Newcastle, Lake Macquarie City Council and the RMS.

The *Newcastle Area Bike Plan*, published in 1981, embodied the four 'Es' - education, encouragement, engineering and enforcement, with encouragement and engineering seen as the primary responsibility of local government. This concept was continued in the *Newcastle Lake Macquarie Bike Plan 1996*. The *Newcastle Lake Macquarie Bike Plan 1996* extended the 1981 plan to cover Newcastle and Lake Macquarie and included a comprehensive and staged action plan for future cycle projects aimed at developing a safe and convenient cycleway network. New cycleway projects in the report comprised regional routes as part of a wide spaced grid (especially suited to commuting) and local routes that connected to local activity centres. The two major off road routes that connect both LGAs were listed as high priority: the Adamstown to Belmont route (the Fernleigh Track) and the Wallsend to Glendale route along a former tramway reserve.

The *Newcastle Lake Macquarie Bike Plan 1996* identified a very large number of engineering projects in five priority lists. Within the Newcastle LGA there were projects valued at $3.8 million (1996 values) in the Priority 1 list, with a further $5.6 million of lower priority works. The majority of the Priority 1 works have been either completed or partly completed (sometimes in a modified form following detailed investigation). Some were deleted following investigations into their feasibility.

Prior to Council's resolution to prepare a cycling strategy and action plan in 2009, a comprehensive review of the *Newcastle Lake Macquarie Bike Plan 1996* had been initiated. It was recognised that the plan required updating to account for projects that had been completed and to include new projects. The revised plan, which was published on Council's web site as the *Newcastle Bike Plan 2009 Discussion Paper*, (http://www.newcastle.nsw.gov.au/__data/assets/pdf_file/0003/67809/draft_bike_plan_web.pdf) was developed in consultation with the Newcastle Cycleways Movement. Adjoining Councils were consulted regarding connections into their areas to ensure the proposals were consistent with their plans.

The review attempted to set realistic short term priorities that could be achieved in several years based on current funding levels. Longer term projects were included in lower priority lists. It was noted that identifying the longer term priorities avoids those projects being forgotten, and if circumstances change (for example, a major development opportunity or funding grant occurs) would allow Council to take advantage of the situation. The contents of the *Newcastle Bike Plan 2009 Discussion Paper* have been largely incorporated in the *Newcastle Cycling Strategy and Action Plan* and have been used as the basis for the route maps in Appendix 3.

2.5.6 Integrated planning and reporting framework and Council's document hierarchy

New legislation affecting councils' planning and reporting requirements, the *Local Government Amendment (Planning and Reporting) Act 2009*, came into effect in October 2009. The purposes of the reforms are to improve the integration of various statutory processes, strengthen councils' strategic focus, streamline reporting and ensure an integrated approach to planning and reporting. The reforms replace the former requirements for a management plan and social plan with an integrated planning and reporting framework and include a new requirement to prepare a long-term community strategic plan and resourcing strategy. The relationships between the documents are shown in Figure 2.

Council has prepared and adopted the *Newcastle Community Strategic Plan* (outlined above) and is currently reviewing its key strategic documents, policies and guidelines to better align with the seven key themes. The *Newcastle Cycling Strategy and Action Plan* is directly aligned to the key theme of connected city.

Figure 2: Integrated Planning and Reporting Framework

2.6 Partnerships and Links

Increased participation in cycling is a common aim of many organisations and interest groups. Council recognises that its own aims can be facilitated by strengthening partnerships and links with these. Ongoing communication with adjacent councils, particularly Lake Macquarie City Council, will be necessary to ensure good connectivity of routes and consistency in route treatments.

The RMS has responsibility for various roads in Newcastle and is the lead agency for many of the actions listed in the *NSW BikePlan.* The RMS has recently established the Hunter Regional Cycling Consultative Forum, to jointly address cycling issues, monitor the implementation of the *NSW BikePlan* actions from a regional perspective and form cross-sectoral partnerships to deliver *NSW BikePlan* actions.

A commitment to the enhancement of cycling in Newcastle is also highlighted in other organisations' strategic directions. This provides the opportunity for collaborative working relationships to achieve cycleway and end-of trip facilities improvements.

The University of Newcastle is one of the largest employers in our area, so this document acknowledges the need to provide strong cycling network links to support staff, student and community trips to the Newcastle City Centre and Callaghan campuses.

The University has released its *2011 - 2013 Environmental Sustainability Plan*, and, of note here is the University's commitment to supporting environmentally sustainable travel options. The *2011 - 2013 Environmental Sustainability Plan* includes a raft of commitments to improving on-campus cycleways and end of trip facilities via the development of their *Sustainable Transport Management Plan*.

As outlined in the Leadership and Advocacy section, it is important that Council's Works Program for local and regional routes interrelates well with the University's campus program being developed by Facilities Management, both on the ground in terms of path connections and through the staging of the respective cycling works programs. The University also has its own Bike Users Group which has been actively engaged with Council in the development of regional route R6 (refer to Appendix 2) and highlighting on-campus solutions.

3. Strategic Directions and Actions - Overview

This section outlines the key objectives and targets of the *Newcastle Cycling Strategy and Action Plan*. The specific strategies and actions to address the objectives are listed in the subsequent sections, with some discussion of the impetus for the proposed actions.

3.1 Encouraging Cycling

The report *Walking and Cycling Literature Review* (Krizek et al, 2009) presents the findings of an extensive literature review, to assist in understanding barriers to walking and cycling as well as infrastructure and policy supports for non-motorised transportation. The report reinforces the message that increasing participation in cycling requires a range of strategies:

> Communities with notably high rates of cycling use many different strategies – programming, policy, environmental design, and other. … More specifically, non-infrastructure modifications may include traffic calming of residential neighbourhoods, restrictions on motor vehicle use, better traffic education of both motorists and non-motorists, and enforcement of traffic regulations protecting cyclists. Coordinated implementation of multi-faceted and mutually reinforcing policies and programs is needed in order to create successful pedestrian and cycling environments (Krizek et al, 2009, p. 37).

The authors observe that there is no single 'silver bullet' to bring about dramatic change (2009, p. 37). However, the authors qualify this by noting that there are instances where certain components must be in place for walking or cycling to occur, which they refer to as necessary conditions. The authors note that to increase cycling, a necessary condition in some environments could be physically separated bicycle facilities, particularly in corridors with high levels of fast moving traffic (Krizek et al, 2009).

The results of the Newcastle Voice survey reflect the need for a broad based approach to increasing cycling participation in Newcastle. Respondents who indicated that they infrequently, rarely or never cycle (56%) were asked to indicate what would encourage them to start cycling or to ride more frequently. The top five aspects that would encourage more cycling are:

- availability of bicycle dedicated lanes and off road routes (60%)
- safer, better lit cycle paths (47%)
- better road/traffic conditions (38%)
- increased driver awareness of bicycle safety and sharing the road (35%)
- improved, continuous marking of shoulder lanes (33%).

For all respondents, the top five future cycling improvements to enhance riding in Newcastle are as follows:

- more on road routes physically separated from traffic (94%)
- more off road routes (90%)
- increased driver awareness about cyclists (87%)
- marked routes with pavement markers (bike logo, route number and direction arrow) (81%)
- bike parking at public transport nodes (78%).

3.2 Objectives

The key objectives of the *Newcastle Cycling Strategy and Action Plan* are:

- to provide a safe, continuous and convenient bicycle network and associated infrastructure, that riders feel safe and comfortable using
- to promote integration of cycling with land use planning and with other modes of transport, in Council's activities and through advocacy to other levels of government
- to foster a culture that regards active transport such as walking and bike riding as the preferred choice for short trips
- to encourage awareness and consideration among all road and path users.

3.3 Targets

Setting of targets is problematic due to the limited base data available. In short, Council does not have a solid understanding of the starting position. As noted in earlier sections, census data, although highly reliable and suitable for trend analysis, presents only part of the picture.

The current State plan, *NSW 2021: A Plan to Make NSW Number One* (NSW Government, 2011) includes the target to more than double the mode share of bicycle trips made in the Greater Sydney region[4] at a local and district level, by 2016. The previous State plan, published in 2010, set a target for the Greater Sydney region of 5% of mode share to cycling for local and district trips by 2016. For the purposes of these targets, local trips are defined as trips of less than 2km and district trips as trips of less than 10km. The *NSW BikePlan* has a clear target to lift to 5% the share of short personal trips by bike in Greater Sydney, for all travel purposes. It also aims to double the use of cycling to get to work, across all of NSW, between 2006 and 2016 (NSW Government, 2010, p. 5).

A key objective of this document is to increase participation in cycling. To effectively monitor progress on this objective, Council will need to implement a specific program of data collection to supplement sources such as the census journey to work data and the Household Travel Survey. Some routes may be selected to be monitored on weekdays, during peak periods, and others at weekends. Six-monthly monitoring of a series of count points will allow more timely feedback on the efficacy of infrastructure works and social programs than is possible at present. Further, the *NSW BikePlan* indicates that such measures as relevant data gathering, modelling and electronic mapping tools will be required by those councils seeking NSW Government funding (NSW Government, 2010, p. 50). A specific action listed in the *NSW BikePlan* is to develop consistent and measurable cycling usage targets for non-commuting purposes and for specific locations (action 6.9, p. 50).

As with patronage data, information about the network is also incomplete. Council is transitioning to a new corporate asset management system. Parameters such as route length, percentage completion, route treatment (and relative proportions), signage installation and bike storage could be reported to monitor progress on implementation of the network.

Targets will be refined as Council builds a more comprehensive picture of cycling in Newcastle and gains a better understanding of what can realistically be achieved. Initial targets have been devised having regard to NSW Government objectives for cycling mode share and available data and are listed below, together with details of the methods or sources to be used to measure progress.

[4] The Greater Sydney region is what the Bureau of Transport Statistics Household Travel Survey describes as the Greater Metropolitan Area, which includes Sydney SD, Illawarra SD and Newcastle SSD (BTS, personal communication, July 2011).

- In accordance with the *NSW BikePlan* target, increase mode share to cycling to 5% for trips less than 10km, by 2016.

  Information from the Household Travel Survey can be interrogated by the Bureau of Transport Statistics to provide percentage mode share to cycling of trips up to 2km (local) and trips up to 10km (district).

- In accordance with the *NSW BikePlan* target, double the mode share to cycling for the journey to work of Newcastle LGA residents between 2006 and 2016.

  The nominated years correspond with the census. Publicly available census data will be accessed to determine the mode share to cycling for the Newcastle LGA in the nominated years.

The following sections of the document detail the actions proposed to be undertaken, to address the targets and objectives. The responsible service unit (within Council), timeframe, and required resources are listed. It is intended that the actions listed will be incorporated in Council's future delivery programs and operational plans.

Various Council documents, such as the *Newcastle Urban Strategy*, include broad-based strategies to support increased mode share to cycling. The proposals included in this document therefore build on an existing platform of measures in progress, or already undertaken, to enhance cycling in Newcastle.

The cycling strategy proposals have been divided into the following sections:

- bicycle network and infrastructure
- promotion and education
- leadership and advocacy
- planning for active transport
- monitoring and review.

The actions proposed by Council are consistent with many of the actions proposed in the *NSW BikePlan*. Where there is a direct correlation, the relevant action number from the *NSW BikePlan* is indicated.

4. Bicycle Network and Infrastructure

Provision of suitable infrastructure is a critical factor in increasing cycling use. Many of the responses to the Newcastle Voice survey on factors to encourage increased cycling related to improvements in infrastructure – particularly those that were perceived to increase the safety of cycling.

Under the Australian and NSW Road Rules, bicycles are considered to be vehicles. As such riders have a legal right to use all public roads, unless specifically prohibited by signage or markings (which occurs in exceptional circumstances, having regard to vehicle volume, speed and safety, though not currently in the Newcastle LGA). The purpose of defining a bicycle network is to encourage new cycling trips and increase the safety of existing trips.

4.1 Bicycle Network

4.1.1 Principles of bicycle network provision

The *NSW Bicycle Guidelines* indicate that the needs of bicycle users and their requirements for an efficient and useable network can be best summed up in five key principles, reproduced below (RTA, 2003, version 1.2 July 2005, p. 10).

Coherence
Bicycle network infrastructure should form a coherent unit by linking popular destinations with local residential streets via regional routes and local routes. The network should be continuous and it should be very clear to the user where the facility leads. Intersections should seek to provide a clear path for bicycle riders as well as for other modes. The quality of network facilities should also be consistent throughout the length of the route regardless of whether the facility uses a separate or shared road profile. Routes should be easy to find from local streets and the network should be of such a density that there is always a choice of nearby routes available to the user.

Directness
Network infrastructure should be as direct as safely practicable. Long detours should be avoided as human energy is required to propel the vehicle. This should always be balanced against the problems of topography – a slightly longer route may work better because it contours around a hill rather than tackling it at its steepest climb. Regional route design should take into account both the slowness in operating speed of bicycles uphill and the relatively high speeds when descending. Delays due to prolonged crossing times of major barriers should be avoided and the aim of the designer should be to ensure that riders are able to maintain a safe, comfortable and consistent operating speed throughout the length of the route.

Safety
Well designed bicycle network infrastructure improves and enhances the road safety of riders, pedestrians and motorists. Intersections should be designed to explicitly include bicycles as well as other categories of road users. Special intersection designs that include a path for cyclists are an important element of integrated network design. Mid-block treatments need to provide safe and easy major roadway crossings for riders. The design of bicycle routes past bus stops should be designed for safe accommodation of riders, bus passengers, other pedestrians and vehicles.

Attractiveness
Community support exists for cycling provided it is an enjoyable activity. Enjoyable cycling requires attractively designed and located facilities. Bicycle network infrastructure, such as regional and local routes, should be fitted into the surrounding environment so that the enjoyment of the experience is enhanced. Clear well-placed signposting should indicate major destinations, while centrelines and edgelines should indicate the serious transport intent of the off road sections of routes. New housing developments should provide easy to

use and attractive bicycle transport facilities. Bicycle routes should also feel safe and offer good personal security. The community prefers well-lit pathways and open-to-viewer routes rather than dark and dingy alleyways.

Comfort
The bicycle network has to be easy to use for all types of riders. A smooth well maintained riding surface is essential for both comfort and operating safety. Depending on the speed and volume of other traffic (motor vehicles or pedestrians), some level of separation is often needed. Clearly marked bicycle facilities that allocate operating space to bicycle users are the most appropriate types of facilities on all but low traffic volume and low speed roads. Effective intersection treatment is a critical factor in joining streets to a coherent route or network, as well as providing safe and comfortable crossings of major arterial roads.

The routes developed through the iterations of bike planning in Newcastle have been based on consideration of employment and education nodes, topography, attractors such as shopping centres, parks and beaches and linkages between them. Traffic volumes, road hierarchy and danger spots have been considered. This basis is consistent with the principles outlined above.

4.1.2 Categories of cyclists

Austroads defines various categories of cyclists and describes their needs, as shown in Table 6. It is usually necessary to provide for more than one category in any corridor. Different types of facilities serve different users and one size of facility does not fit all. In the right context, redundancy is all right and should not necessarily be avoided (Krizek et al, 2009).

Category	Rider characteristics	Riding environment
Primary school children	Cognitive skills not developed, little knowledge of road rules, require supervision.	Off road path, footpath (where permitted) or very low volume residential street.
Secondary school children	Skill varies, developing confidence.	Generally use on road facilities or off road paths where available.
Recreational	Experience, age, skills vary greatly.	Desire off road paths and quiet local streets, avoid heavily trafficked routes, more experienced will prefer to use road system for long journeys.
Commuter	Vary in age, skill and fitness, some highly skilled and able to handle a variety of traffic conditions.	Some prefer paths or low-stress roads, willing to take longer to get to destination, others want quick trips regardless of traffic conditions, primarily require space to ride and smooth riding surface, speed maintenance.
Utility	Ride for specific purposes (shopping), short length trips, routes unpredictable.	Not on highly trafficked roads, needs include comprehensive, low-stress routes, appropriate end of trip facilities.
Touring	Long distance journeys, may be heavily equipped, some travelling in groups.	Often route is similar to that of other tourists.
Sporting	Often in groups, two abreast occupying left lane, needs similar to commuters.	Travel long distances in training on arterials, may include challenging terrain in outer urban or rural areas, generally do not use off road routes because of high speed and conflict with other users.

Table 6: Categories of cyclists and their characteristics
Source: Table 2.3 in *Cycling Aspects of Austroads Guides* (Austroads Ltd, 2011a)

4.1.3 Newcastle's network

Newcastle's existing bicycle network is made up of marked on road routes and off road shared paths. In some suburbs, there is an extensive network of footpaths which can be used by riders aged 12 and under and accompanying adults.

The network developed over the last three decades, through implementation of the bike plans, subdivision works in new development and recreation projects, provides Newcastle with a solid base from which to expand and improve. The major focus of Council's spending on cycleways in the last decade has been on completion of major off road routes – the Fernleigh Track, the Wallsend to Glendale link and the Stockton cycleway. These comprise significant parts of regional routes.

Appendix 2 provides a description of each route, its connectivity and opportunities when complete and a brief discussion of improvements and specific problems. The network is shown in the route maps in Appendix 3. The maps indicate existing and proposed on road and off road routes. Existing sections are marked with continuous lines (coloured red for on road and blue for off road) and proposed sections as broken lines. As noted, previous bike plans, namely *the Newcastle Lake Macquarie Bike Plan 1996* and the *Newcastle Bike Plan 2009 Discussion Paper*, have provided the basis for the mapping. Some additional routes and modifications have been incorporated in the mapping, arising from:

- consideration of recent and proposed development, particularly in the western corridor
- desktop audit
- partial on site audit of the network
- recent and ongoing public domain projects.

Several routes shown in the network maps have had detailed design work completed, and parts are scheduled for construction. For the majority of proposed routes, detailed design work has not been completed. It is at the design stage that constraints are fully investigated and mitigation measures determined. The specific location of services and trees, for example, may impact on the space for a bicycle facility. In some instances, a minor route adjustment may avoid some constraints but still achieve the network objectives of coherence, directness etc.

In the maps at Appendix 3, routes are labelled as regional, local or scenic/recreational. Note that some routes will serve a dual role.

- Regional – direct travel routes on and off road, connecting regional centres, high activity areas and adjacent LGAs. The roads may be busy and some on road routes will be suitable only for experienced riders wanting a direct route.
- Local – mainly using local roads and off road paths to connect to regional routes, commercial centres, recreation facilities, etc. The roads are less busy and generally suitable for less experienced riders including children, novice riders, family groups and for local trips. They are usually less direct than regional routes but allow inexperienced/novice riders the option to plan a more comfortable trip that minimises their exposure to traffic.
- Scenic – mainly using local roads, off road paths and trails, their primary purpose is for recreation, touring and sport/fitness (e.g. local fitness circuits identified in the *Newcastle Recreation Plan*).

Over time, opinions have changed regarding what is considered an acceptable standard of provision for bicycle facilities, particularly for on road treatments. Some sections of the on road network comprise marked shoulder lanes, in which parked vehicles and riders share space - so called 'car door death lanes'. Experience has shown this treatment (marked with a solid white line to define the edge of the traffic lane and a dashed line to define the parking area) to be highly undesirable due to inadequate clearance between parked vehicles and

cyclists. Some sections with this treatment are marked as existing routes in the route maps, however it is intended that potential for alternative treatments be assessed as part of the network audit. Council aims to gradually phase out existing instances of this treatment as resurfacing occurs and will advocate to RMS for similar action on roads within their control. Revised standards dictate a safety strip of one metre between parked vehicles and the bicycle lane.

Example of bicycle shoulder lane, with rider demonstrating safer, more visible positioning away from the car door zone.

A full audit of the existing network has been initiated, to identify issues relating to safety, lighting, maintenance requirements, support facilities (such as bike racks, drinking fountains and seating), non-compliance with guidelines, connectivity issues and potential for reallocation of road reserve (for example, changes to travel land widths, parking) and other measures to improve the cycling environment.

4.1.4 Network development priorities

The Works Program included at Appendix 4 shows indicative prioritisation of works. Refinement of procedures to prioritise works is required. Council proposes to develop a rating system to ensure consistent and transparent ranking of works for inclusion in future operational plans. Consideration could include, but not be limited to:

- connectivity – continuity of route
- affordability
- safety and comfort
- potential to increase patronage
- potential to attract grant funding.

Reassessment of works, priorities and costings will be undertaken in conjunction with completion of the network audit. Appendices 2, 3 and 4, which are to be considered 'live' documents, will be updated accordingly.

4.2 Route Design

4.2.1 Standards, guidelines and innovation

Planning and design of bicycle facilities by or on behalf of Council is carried out in accordance with the following documents:

- Austroads guides
- Australian standards
- *NSW Bicycle Guidelines* (RTA, 2005)
- *Planning Guidelines for Walking and Cycling* (DIPNR, December 2004).

In addition to the *NSW Bicycle Guidelines*, the primary references for on road facilities are *Guide to Road Design Part 3: Geometric Design* (Austroads, 2010a) and the related RMS supplement, which provides specific details for application of Austroads guides in NSW. For off road facilities, a key reference is *Guide to Road Design Part 6A: Pedestrian and Cyclist* Paths (Austroads Inc., 2009). These documents provide information on specific requirements relating to vertical and horizontal alignment, width, sight distances, gradients, intersections and other features. Parts of these documents have been reproduced in the following sections.

Standards and guidelines change over time and parts of the existing network would not meet current requirements. For example, some older shared paths do not meet the current recommended minimum width and old signage does not meet current Australian standards.

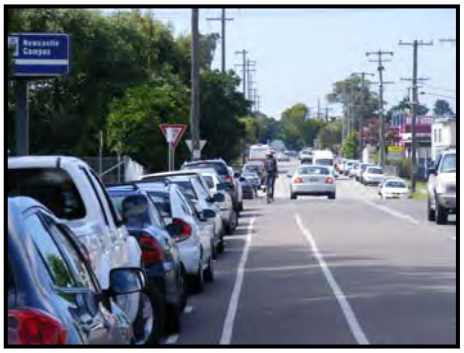
Constraints

As noted in section 4.1.3, all constraints are not identified until concept and detailed design stages. Pre-existing conditions and Council policy may impact on how the standards are addressed and dealt with on a case by case basis. For example, objectives of Council's Urban Forest Policy include: increase the extent of the urban forest; compensate for any loss arising from the development process; improve overall structure, health and condition of the urban forest; improve the compatibility of trees and vegetation with buildings and infrastructure through planning, design, engineering and arboricultural practices. Removal of tree assets to construct bicycle facilities to standard is clearly not consistent with these objectives. A change to the route, a change in alignment of a route section to avoid the constraint, or change to a path width may be considered to address the constraint.

Reallocation of road space, such as parking space, may be an option. Where departures from the current standards are required to accommodate existing constraints, Council will undertake a risk assessment process and develop appropriate management strategies.

Innovation

There may be situations in which a new design or approach not covered by the current guidelines warrants development and trial. This is particularly relevant when retrofitting cycleways into established development, as there are many constraints in comparison to undeveloped (greenfield) areas. Innovation, within a framework of appropriate risk assessment and evaluation, should be supported.



Chinchen St trial - narrowing of traffic lanes to provide bicycle lanes with separation to parked vehicles. Note that this treatment is no longer possible due to RMS requirements for minimum 1m safety strip.

Bypass of traffic calming device to allow unimpeded travel by cyclists (Teralba Rd)

Shared path users given priority through intersection by reversing 'Give Way' signage. Use of grey coloured pavement material next to kerb delineates safety strip for vehicle overhang.

4.2.2 Flooding, sea level rise and inundation

The Newcastle coastline is currently vulnerable to coastal hazards, including erosion and inundation. Stockton beach has been subject to a long history of ongoing coastal erosion, and parts of Shortland Esplanade and Stockton are occasionally inundated during storm events.

Climate change is expected to lead to increasing coastal hazards associated with sea level rise and more frequent extreme storm events. Sea levels along the NSW coastline are projected to increase by 0.4m by 2050 and 0.9m by 2100 (compared to 1990 mean sea levels). Council is currently preparing the *Newcastle Coastal Zone Hazard and Management Studies*, which will identify and map areas at risk to coastal hazards and describe the potential management options for addressing coastal hazards.

Shared pathways that are proposed to be located within coastal hazard areas will need to appropriately consider the hazard during the design phase.

Flood risk must also be considered in the design phase. About 70% of the Newcastle LGA is understood to be pre-existing natural floodplain. Council's knowledge of the extent of potential flood risk has grown as data collection and specialist studies have been carried out. Council is preparing a city wide floodplain risk management plan which will describe ways to manage and live with flash flooding in the urban areas, Hunter River flooding and sea level flooding (including long term sea level rise). Once the plan is finalised and adopted, there may be some changes to current procedures for assessment of development on flood prone land.

4.2.3 Bicycle facilities

The existing network comprises off road paths and on road routes. The overwhelming majority of the off road paths are designed for shared use by cyclists and pedestrian. On road facilities may be:

- physically separated bicycle lanes, either single direction or bi-directional
- visually separated bicycle lanes, with or without adjacent parking
- wide sealed road shoulder
- mixed traffic lanes.

The RMS's *NSW Bicycle Guidelines* provides specific guidance for selection of the type of facility that should be provided, having regard to the speed environment and the volume of traffic. Figure 3.2 of the *NSW Bicycle Guidelines*, which has been incorporated in current Austroads guides, demonstrates the relationship and is reproduced in Figure 3.

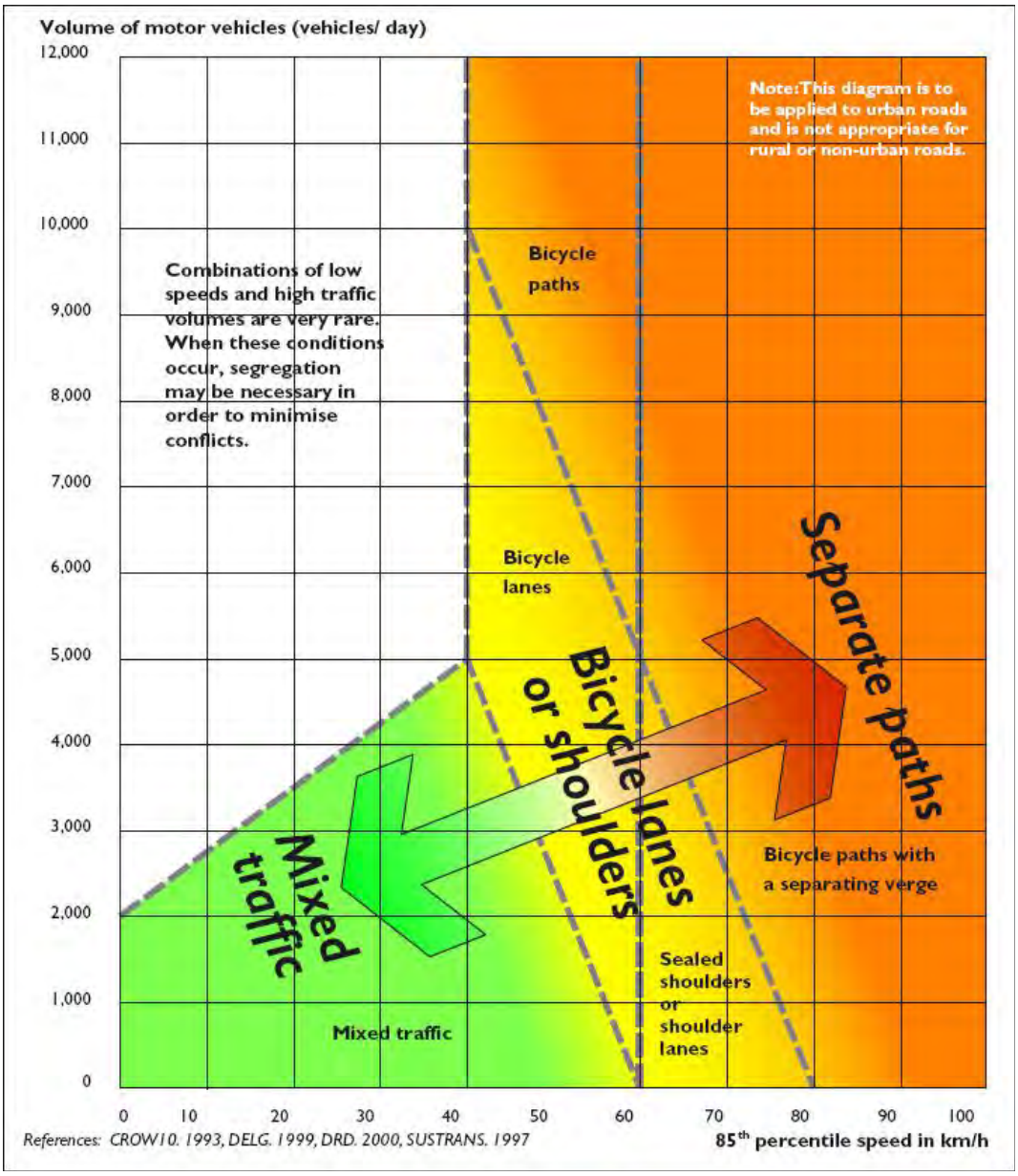


Figure 3: Separation of bicycles and motor vehicles according to traffic speed and volume
Source: Figure 3.2, *NSW Bicycle Guidelines* (RTA, 2003, p. 13), Figure 2.1 of Austroads Ltd (2011a)

Separation of cyclists from motor vehicles is not always required. On local and collector roads that have traffic volumes less than 5000 vehicles per day and speeds less than 40km/h it is considered appropriate that adult cyclists may share the road with motor vehicles and younger cyclists may use the footpath.

Throughout Newcastle, the introduction of 50km/h and 40km/h high pedestrian activity areas has provided for safer environments for pedestrians and cyclists. Council is continuing to develop 40km/h high pedestrian activity areas through suburban shopping centres in conjunction with the RMS.

Experienced road cyclists are unlikely to use off road facilities with low design speeds, even on routes where the road carries high volume, high speed traffic. On road bicycle provision will still be required in addition to off road facilities.

In new development areas, compliance with Figure 3 is relatively straightforward as the needs of cyclists can be considered at the outset and appropriate provision made. Council's road hierarchy consists of arterial roads (70km/h – 90km/h), sub-arterial roads, collector roads (60km/h) and local roads (40km/h – 60km/h). Council's NDCP requires on road provision and off road shared path of minimum width 2.5m on new collector roads.

The survey *Cycling in Newcastle* indicated that the one most strongly sought change to the network in Newcastle is the separation of bike lanes from traffic (p. 34). This theme was also evident in consultation undertaken for the Newcastle 2030 project. In Sydney and Melbourne, and internationally, there is recognition that a much higher standard of facility is required to boost cycling, particularly facilities that separate riders physically from motor vehicle traffic.

Retrofit of facilities poses many challenges. The cost of provision of such lanes can be very high. Significant changes to road infrastructure such as kerb and gutter, drainage, utilities, landscaping, driveway accesses, position of lighting, parking, transport stops and signage may be involved. Public domain works may be required, demanding a high level of consultation. Issues to be considered in assessing a road section for treatment include:

- road reserve, travel lane and footway widths
- traffic capacity, current and projected future use
- parking, impact of potential loss of spaces
- adjacent land uses
- route classification, current and anticipated future use
- intersection layout.

Much of the road network in Newcastle comprises roads with a carriageway of 12.8m, which is a major constraint on installing safe on road treatments in Newcastle. It is recognised that the only type of on road treatment that can be safely and easily installed on roads of this width without the removal of kerbside parking is a wide shared lane (referred to in the *NSW Bicycle Guidelines* as 'mixed traffic – spacious profile'). It is not possible to retrofit visually separated bicycle lanes or physically separated bicycle lanes with adequate safety strips on roads of this width without significant reallocation of road space and changes to parking arrangements.

There are many streets of this width that comply with the requirements of Figure 3 for mixed traffic (wide shared lane) as discussed above, and these will require little more than the marking of PS-2 (bicycle) logos in accordance with Appendix 5 Figure 1.2. It is also recognised that many 12.8m wide streets proposed for on road treatments in the route maps (Appendix 3) will have traffic volumes and/or speeds that to comply with Figure 3 would require separated facilities.

Council is committed to pursuing both visually and physically separated bicycle lanes in accordance with Figure 3 in key locations, to address concerns expressed through the *Cycling in Newcastle* survey and other consultation processes. However the challenges

associated with constructing these facilities along with the constraints of the budget and grant funding processes will determine the length of separated on road facilities that can be built during any given year, and the locations in which they can feasibly be provided. Due to the volume of roads that qualify for separated facilities, it is likely to be many years before the bicycle strategy can be implemented in full accordance with Figure 3.

In the meantime, it is important that as much be undertaken as possible to improve safety on roads that are waiting for resourcing and funding for separated facilities. It is proposed that these roads be marked with wide shared lanes as this is the safest possible treatment available to improve the cycling environment that can be implemented with minimal cost.

Current Austroads and RMS guidelines on the use of wide shared lanes provide little detail on ways to mark the lanes that are highly visible and draw attention to the presence of cyclists. Council has developed a trial wide kerbside lane treatment for use on collector and sub-arterial roads which is shown in plan view in Appendix 5, and discussed in 4.2.4 below. It is envisaged that if successful, in the short term this type of treatment would replace bicycle shoulder lanes as the predominant on-road treatment in Newcastle.

Council has initiated a project to investigate modification of some inner city bike routes for physically separated lanes (Inner City Bike Lanes Investigation). Two other areas are shown in the route maps as investigation areas – Union St and Watt St. A city wide assessment to determine the potential of route sections for physically separated facilities has not been undertaken.

As part of the network audit, a preliminary assessment of the route's potential and suitability for separated bike lanes will be undertaken. It should be noted that proposals to change travel lane widths will require approval of the Newcastle City Traffic Committee. Also, any changes to parking arrangements would not be implemented without consultation with affected residents.

4.2.4 On road treatments

Appendix 5 shows the range of on road treatments, reflecting revised standards, that are proposed to be used in Newcastle. Many of these facilities have been implemented in recent years on key routes such as R6 (Newcastle City Centre –University - Birmingham Gardens), or are scheduled, or currently under construction, in locations such as Scenic Dr and John Pde, Merewether. Figure 1.2 (wide shared lane) of Appendix 5 is supported by two plan views detailing the markings currently being installed when marking wide shared lanes on local/collector roads, and the proposed trial markings for wide shared lanes on collector/sub-arterial roads.

Bicycle lanes
These are referred to as exclusive bicycle lanes in Austroads when located next to the kerb and as bicycle/car parking lanes when adjacent to parked cars. The actual width adopted for bicycle lanes will depend on a range of factors, including:

- numbers of cyclists
- speed
- volume of vehicles, including number of large vehicles
- ability to make space available
- needs of other road users
- physical and budgetary constraints.

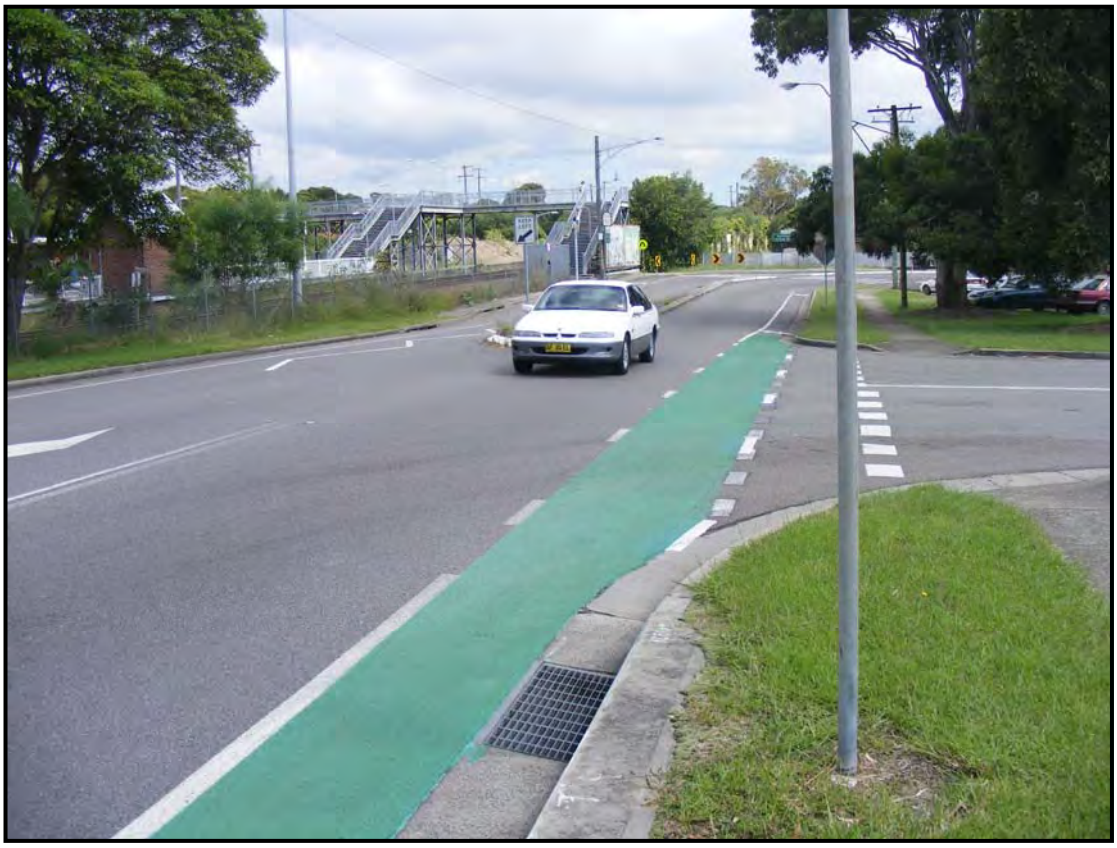
Recommended minimum bicycle lane widths without parking are shown in Table 8.

Road posted speed limit (km/h)[1]	**Lane width [2], [3] (m)**		
	60	80	100
Desirable	1.5	2.0	2.5
Acceptable	1.2 – 2.5	1.8 – 2.7	2.0 – 3.0

Table 8: Exclusive bicycle lane dimensions in urban areas

1 The posted or general speed limit is used, unless 85th percentile speed is known and is significantly higher.
2 Interpolation for different speed limits is acceptable.
3 The width of the lane is normally measured from the face of the adjacent left-hand kerb. The width of road gutters/channels (comprising a different surface medium) should be less than 0.4 m where minimum dimensions are used. The figures in the table presume that surface conditions are to be of the highest standard. Where there are poor surface conditions (see Austroads *Guide to Road Design – Part 6A,* Appendix B (Austroads 2009m) over a section of road adjacent to the gutter, then the width of the exclusive bicycle lane should be measured from the outside edge of that section.
Source: Table 4.17 Austroads Ltd (2010a)

When a bicycle lane is located adjacent to parking, clearance is required to provide space for people to exit vehicles without risk to riders in the bicycle lane. The current standards for this type of facility, as indicated by the RMS supplement to the Austroads guides, require provision of space for parking (2.0m to 2.3m), a safety strip (1.0m) and bicycle lane (1.4m to 2.5m), with widths for the bicycle lane dependent on the speed environment.



Wide shared lane

A wide shared lane is referred to as a wide kerbside lane in Austroads, and as 'mixed traffic – spacious profile' in the *NSW Bicycle Guidelines*. A wide shared lane is a marked lane on the left side of the carriageway of sufficient width to allow cyclists to travel beside the main traffic stream and to permit motorists to overtake cyclists without having to effectively change lanes. As discussed in 4.2.3 above, wide shared lanes are likely to become the predominant on road treatment in Newcastle in the short term as they are the only on road bicycle facility that can be installed on 12.8m wide roads without the removal of kerbside parking.

It is not intended to install wide shared lanes in higher speed zones (70km/h and 80km/h) as a long term solution. In these cases, options for exclusive bicycle lanes will be explored.

Council has developed a trial treatment for marking wide shared lanes on collector and sub-arterial roads (see plan views in Appendix 5). The proposal incorporates edgelines, PS-2 (bicycle) symbols, bicycle lanes with green paint through side streets and conflict areas, and a green broken line marked between the edgeline and the bicycle symbols. The purpose of these markings is to reinforce the presence of cyclists on the road carriageway, and to support their positioning within the shared lane as opposed to the car door opening zone.

The main advantages of this treatment are the legitimising of good cyclist positioning on a shared carriageway, and the highly visible nature of the markings reinforcing the presence of cyclists, particularly across side streets. However, it is recognised that this treatment is unlikely to appeal to new cyclists, and it is not intended to replace the construction of visually and physically separated bicycle lanes in accordance with Figure 3.

Dimensions for wide shared lanes are shown in Table 9.

Road posted speed limit (km/h)[1]	**Lane width [2], [3] (m)**	
	60	80[4]
Desirable	4.2	4.5
Acceptable	3.7 – 4.5	4.3 - 5

Table 9: Wide kerbside lane dimensions

1 The posted or general speed limit is used, unless 85th percentile speed is known and is significantly higher.
2 Interpolation for different speed limits is acceptable.
3 The width of the lane is normally measured from the face of the adjacent left-hand kerb. The width of road gutters/channels (comprising a different surface medium) should be less than 0.4m where minimum dimensions are used. The figures in the table presume that surface conditions are to be of the highest standard. Where there are poor surface conditions over a section of road adjacent to the gutter, then the width of the wide kerbside lane should be measured from the outside edge of that section.
4 For roads with a posted speed limit of 80km/h, wide kerbside lanes are only suitable where the demand for parking is low.
Source: Table 4.20 of Austroads Ltd (2010a)

Narrow shared lane

A narrow shared lane is referred to as 'mixed traffic – tight profile' in the *NSW Bicycle Guidelines*. A narrow shared lane is only appropriate in low traffic areas with observed speeds of 40km/h or less. The maximum width of a narrow shared lane is 3.3m to ensure motor vehicles do not attempt to pass a cyclist without performing an overtaking manoeuvre that would require them to move into the opposing lane. It is intended to reinforce the presence of cyclists in narrow shared lanes on proposed bicycle routes by marking PS-2 (bicycle) symbols in the centre of the shared lane. A recently installed example of this treatment is on Workshop Way, Newcastle.

Narrow shared lane – Scholey St overbridge.

Physically separated (protected) bicycle lanes

Physically separated (protected) bicycle lanes are bicycle lanes separated from traffic and parked vehicles by a physical barrier such as a concrete kerb. Physically separated lanes can be one direction in the same direction as the traffic flow on both sides of the road, one direction in a contra-flow direction on one-way roads, or bi-directional on one side of a one or two way road.

The City of Newcastle will be constructing its first physically separated bicycle lane during 2012 on John Pde, Merewether. This lane will be a contra-flow lane with physical separation from the one-way traffic in the opposing direction.

4.2.5 Off road paths

Path width

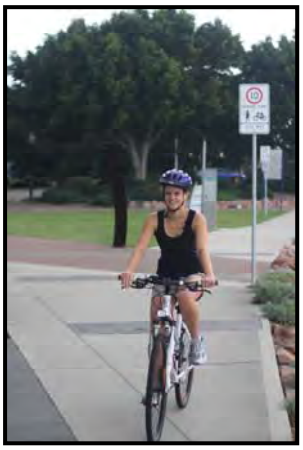
The width of a path has a significant bearing on construction costs and is perhaps the most obvious characteristic affecting useability. Minimum widths for different uses are recommended in Austroads guidelines and are shown in Table 7. The minimum width is 2.5m.

	Path width (m)		
	Local access path	Commuter path	Recreational path
Desired minimum width	2.5	3.0	3.5
Minimum width – typical maximum	2.5(1) – 3.0(2)	2.5(1) – 4.0(2)	3.0(1) – 4.0(2)

Table 7: Shared path widths
1 A lesser width should only be adopted where cyclist volumes and operational speeds will remain low.
2 A greater width may be required where the numbers of cyclists and pedestrians are very high or there is a high probability of conflict between users (e.g. people walking dogs, roller bladers and skaters etc.).
Source: Table 7.4 of Austroads Inc. (2009b)

Austroads Inc. (2009b, p. 83) provides the basis for the dimensions shown in the table:

- Major recreational paths should be 4.0m wide to permit the cyclist groups/couples to pass pedestrian couples or other cyclist groups, or to permit cyclists travelling in opposite directions to pass pedestrians with convenience and safety. However, it should be noted that in some jurisdictions cyclists may be prohibited from riding side-by-side on shared paths.
- Shared use paths often experience a mix of simultaneous commuting and recreational use and in these circumstances should have a minimum width of 3.5m.
- 2.5m and 3.0m are the absolute minimum widths for paths having a predominant purpose of commuting and recreation respectively, during periods of peak use.
- 2.0m is an acceptable path width where paths experience very low use at all times and on all days, where significant constraints exist limiting the construction of a wider path, and may be acceptable for a commuting path where the path user flows are highly tidal in nature.
- 3.0m is the minimum path width for a path where high speeds (i.e. 30km/h +) occur.



Austroads Inc. (2009b, p. 44) also notes that the upper limit of the acceptable range should not discourage a greater width where it is needed.

Council's development controls require that for new development, the minimum width of a shared path is 2.5m. There are some parts of the existing network which have narrower paths and which may continue to be adequate. It will be necessary to monitor use and feedback to determine if upgrading of the paths will be required.

In other areas, levels of use have changed such that path widths are now inadequate or unable to cater for expansion. The high observed use of regional shared path facilities highlights the importance of building paths of adequate width to cater for high levels of patronage growth.

Public domain planning is currently underway for the Bathers Way, an iconic coastal walk, to consider how best to cater for cyclists along the route. In such areas of very high anticipated use, path widths greater than the typical maximum are being proposed.

Austroads (2009b, p. 83) indicates that separation of pedestrians and cyclists is preferred when user volumes and other factors indicate that a path width of greater than 4.0m is required, in order to maximise efficient use of the path and make user movements more predictable. In the event of ongoing conflict, reinforcement of positive behaviours (keeping left, bell-ringing etc.) would be undertaken prior to delineation of separate spaces.

Gradient
Information provided in the current standards and guidelines in relation to longitudinal gradient on off road paths may be summarised as follows:

- Longitudinal gradients should be as flat as possible.
- Above 3% the acceptable length reduces rapidly and it is considered this is the desirable maximum gradient for use on paths.
- In cases where 3% cannot be achieved consideration should be given to limiting gradient to a maximum of about 5% and providing short flatter sections (say 20m long) at regular intervals to give cyclists travelling both uphill and downhill some relief from the gradient.
- Gradients steeper than 5% should not be provided unless it is unavoidable.

Primary considerations in relation to gradient on off road paths will be the speeds that can be reached on a downhill slope and the wobble factor on uphill slopes. Mandatory speed limits are not an option, as bicycles are not required to have a speed measuring device. Education and signage with advisory speed limits, which are a reminder to riders to keep speeds compatible with other users, can be effective.

Centreline marking
Section 6.2 of the *NSW Bicycle Guidelines* states that off road bicycle paths and shared paths are road related areas and should be marked with a centreline to permit safe operation of the facility. Many shared paths in the Newcastle LGA are not currently marked with centrelines. Notable exceptions include the Throsby Creek shared path (route R6) and the Fernleigh Track (route R1). It is widely recognised that centreline marking along with PS-3 (bicycle), PS-4 (pedestrian) and PA-1 (directional arrow) symbols reinforced by 'share the path' behavioural signage improves users' adherence to the keep left rule and minimises possible conflict between various users. It is Council's intention to continue with its program to retrofit the majority of shared pathways with centreline marking and advisory symbols.

Terminal treatments
Many off road paths in the Newcastle LGA have bollard terminal treatments that do not comply with the requirements of Austroads and RMS guidelines. Council intends to continue with its program to progressively remove all of these bollards and replace them only in locations where necessary to physically prevent motor vehicle access with complying terminal treatments.

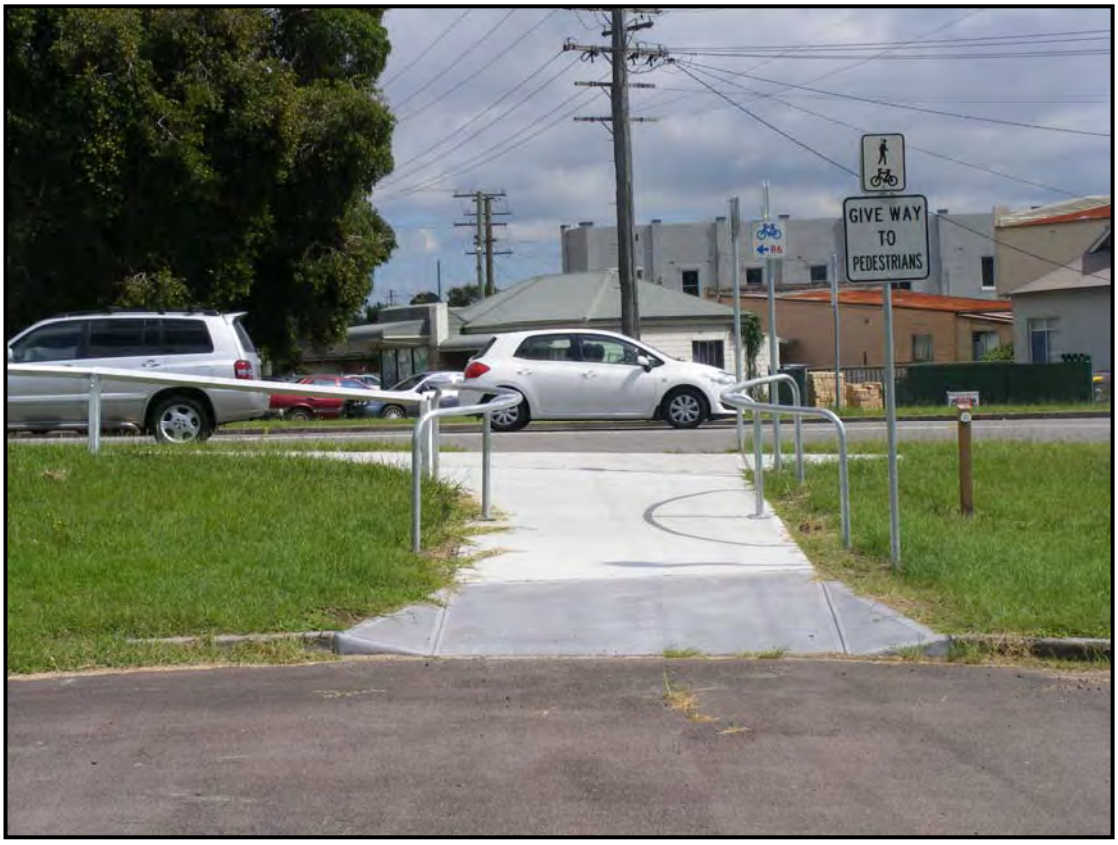
This bollard terminal treatment does not comply with Austroads requirements. Vegetation on approach side also limits visibility of the oncoming path obstruction.

Terminal treatments to be considered for each site are listed below in priority order:

1. Austroads *Guide to Road Design Part 6A: Pedestrian and Cyclist Paths*, Figure 10.1: Separate entry and exit terminal

2. Austroads *Guide to Traffic Engineering Practice Part 14: Bicycles*, Figure 6-38: Deflection Rail Terminal Details

3. Austroads *Guide to Road Design Part 6A: Pedestrian and Cyclist Paths*, Section 10.4.2: Bollards and U-rails



These recently installed deflection rails are awaiting installation of reflector tape. The height and rounded edge is designed to minimise injury in the event of a collision.

4.2.6 Intersection treatments

The selection of appropriate infrastructure provision at intersections is considered a critical safety issue for cyclists. In particular, provision for cyclists at traffic signals and roundabouts in many instances is currently lacking or non existent, resulting in missing links on existing routes at the points where provision is most important. The following is a guide to treatments that may be considered for use at signalised intersections and roundabouts in the Newcastle LGA.

Traffic control signals

A marked bicycle lane should be provided on approach and on exit of the traffic control signals in accordance with section 10.6.4 of *Guide to Road Design Part 4A: Unsignalised and Signalised Intersections* (Austroads Ltd, 2010b). The use of head start and expanded storage areas, hook turn storage boxes and hook turn restrictions, left turn bypass treatments, and bypass of a T-intersection should be considered in accordance with this guideline.

Where major routes travel through signalised intersections that attract a high level of usage of less confident riders, it may be appropriate to provide an additional level of separation through the use of a kerbside bicycle lane and expanded storage area, in conjunction with bicycle

lanterns with a push button or separate sensor control allowing a short timed head start for cyclists. This avoids the need for the bicycle lane to be located between through traffic and the left turn lane, providing additional safety and separation. Examples of this type of treatment can be found in Melbourne, Victoria.

The current practice of marking PS-2 bicycle symbols in a dedicated left turn lane to indicate that cyclists should use this lane when travelling through a signalised intersection does not meet design guidelines and is not considered appropriate except in circumstances where it is not physically possible to locate a bicycle lane, or as an interim measure whilst waiting for intersection improvement works. All other treatments should be considered before consideration of this option, such as combining the left turn lane with the through lane, or narrowing of existing traffic lanes to create space for a dedicated bicycle lane. If it is deemed that a shared left turn/bicycle through lane is the only on road option due to the physical constraints of the intersection, off road provision should be made on the footpaths adjacent to the intersection incorporating bicycle lanterns in conjunction with all pedestrian phases to enable less confident bicycle riders safe passage through the intersection.

Dedicated bicycle lane with green paint on approach to traffic signals.

Example of a bicycle lantern incorporated into traffic control signals.

Roundabouts

Roundabouts are considered problematic for cyclists and should be avoided as intersection treatments where possible on bicycle routes. Section 5.1 of Austroads *Guide to Road Design – Part 4B: Roundabouts* (p. 48) states:

> A number of studies have shown that roundabouts increase the risk of crashes for cyclists and this fact needs to be taken into account when considering the adoption of a roundabout treatment at an intersection. Cyclists are involved as circulating vehicles in a high percentage of entering/circulating vehicle crashes and this is likely to relate to entry speeds and motor vehicle drivers scanning behaviour on the approaches.

Where roundabouts cannot be avoided, warning signs and delineation should be provided to alert motor vehicle drivers to the presence of cyclists, and the intersections should incorporate a high level of approach site distance and street lighting.

Austroads *Guide to Road Design – Part 4B: Roundabouts* gives a number of possible treatments for consideration through roundabouts. It also notes that the 'benefit of the treatments suggested in this section to improve the situation for cyclists at roundabouts has not necessarily been confirmed through appropriate studies' (Austroads Inc., 2009a, p. 50). A number of the treatments suggested for single lane roundabouts include the marking of a bicycle lane up to and through the roundabout to the left of the travel lane to 'improve drivers' awareness of the possible presence of cyclists and to provide some separation for cyclists from motor vehicles within the roundabout' (p.50).

Section 5.5.1 of *Cycling Aspects of Austroads Guides* (p. 70) notes that:

> A number of jurisdictions do not favour the provision of bicycle lanes on the approach to, and around the periphery of, roundabouts. Designers should clarify the policy of local jurisdictions before considering the application of cycle lanes at roundabouts. The matter is under review by the Austroads Road Design Review Panel and other key stakeholders including cycling organisations and road safety practitioners. Further advice will be issued in due course.

Whilst the City of Newcastle has in the past marked bicycle lanes through single lane roundabouts, it is currently Council's position that the safest way for a cyclist to negotiate a single lane roundabout is to command the travel lane. In this way the rider becomes highly visible, is in full control of their manoeuvre, and is able to safely turn right without cutting across through traffic. In accordance with this position and section 5.5.1 of *Cycling Aspects of Austroads Guides*, it is not intended to provide bicycle lanes on the approach to and through single lane roundabouts. To accomplish the intent of Austroads *Guide to Road Design – Part 4B: Roundabouts* to 'improve drivers' awareness of the possible presence of cyclists', it is proposed to mark PS-2 bicycle symbols in the centre of the carriageway on approach to the single lane roundabout and in the centre of the carriageway through the roundabout. An example of this treatment can be found at the recently completed Merewether St/Workshop Way roundabout, Newcastle.

Provision of off road path bypasses should be considered in higher volume and/or higher speed single lane roundabout locations.

Two lane roundabouts should be avoided on all bicycle routes. Where this is not possible, off road path bypasses incorporating high speed exit and entry bicycle ramps should be provided at all legs of the roundabout to enable cyclists to exit the road to safely negotiate through the intersection.

Logos on approach and through the roundabout at Merewether St/Workshop Way, Newcastle.

4.2.7 Path surface

Cyclists require paths with good drainage properties and a smooth riding surface. In addition to these considerations, the type of surface treatment used for off road paths is influenced by factors such as amenity, risk and whole of life costs. Whole of life costs are those relating to:

- construction – material purchase and placement
- maintenance – required intervention, performance history, repair and rehabilitation
- disposal.

These considerations favour the use of asphalt and concrete surfacing. Sites with poor ground conditions and environmentally sensitive locations will require careful consideration.

4.2.8 Safer by design principles

Design of bicycle facilities should have regard to the principles of Crime Prevention through Environmental Design (CPTED).

Where it is anticipated that substantial numbers of cyclists and/or pedestrians are likely to use a path during periods of poor light (dawn, dusk) or at night, consideration should be given to lighting of the path. Lighting will assist in detection of potential hazards, engendering a sense of security and discouraging crime. Lighting design should consider the energy usage, visual impact of lighting equipment and minimising light pollution. Lighting should be designed in accordance with AS/NZS 1158.3.1:2005, (e.g. lighting level P2 or higher).

4.3 Route Signage

Signage includes regulatory signage and logos, and directional and destination signage. Regulatory signage must comply with the standards and guidelines referenced previously. The network audit will identify sections that do not comply.

Installation of directional and destination signage is an overall, city wide priority. Lack of directional and distance information on routes has been highlighted though community feedback as an issue of concern. It proposed to identify all routes with bike logo, route number and directional signage arrow to assist cyclists following a route: R1, R2, etc would indicate regional routes; L1, L2, etc would indicate local routes.

A suite of signage has been developed and installed recently on R6 (Newcastle City Centre – University - Birmingham Gardens). Subject to acceptance, it will be progressively implemented on other routes.

4.4 Bike Parking

The provision of support infrastructure such as bike parking is an enabling factor for increased participation in cycling. Bicycle parking facilities at shops, libraries and sporting venues, for example, may encourage increased local trips by bike. The type of parking facility provided will depend on the destination and trip purpose. Three broad categories can be defined:

- all day parking at trip destinations (for example, for students and employees)
- all day parking at public transport interchanges
- short term parking.

Parking should be plentiful, highly visible, easy to use and conveniently located. As noted in Section 7, bicycle parking takes the form of a rack, locker or enclosure, or a combination of these, such as a rack within an enclosure.

Bike parking requirements for new development are addressed through the development assessment process and are detailed in the NDCP. Council has responsibility for installation of bike parking in areas within its control, such as parks and reserves, and on footpaths in mainstreets, for example. As such, the majority of parking provided by Council takes the form of racks.

The rack should support the whole bike, not just a wheel and enable the frame and one or both wheels to be secured. Bike racks that support only the wheel are not adequate as the wheel can be easily damaged by these racks.

Retrofitting of bike parking has occurred on an ongoing basis, in response to specific requests and subsequent assessment rather than in accordance with a specific plan for installation of bike parking. As Council does not have an accurate database of existing bike parking facilities in the public and private domain, the actions listed under this heading include an audit of distribution and condition of existing facilities, as part of the full audit of the network. Unsuitable bike parking will be removed and replaced, as required.

Although a majority of respondents to the Newcastle Voice survey indicated that they park their bike at their home, securing bikes to street furniture was a common response, suggesting a shortage of appropriately located bike parking. There are areas where additional bike parking would be desirable (and which would be required by current development controls) for which Council is not the land owner or authority. In these cases, Council's role is one of advocacy and encouragement.

4.5 Maintenance

An important component of cycling infrastructure which has not been clearly identified in previous bike plans is the ongoing need for maintenance of the network. Depending on the particular facility, this may encompass periodic sweeping for removal of broken glass and other debris, resurfacing, repair of potholes, re-linemarking, signage, trimming of vegetation etc. Ongoing maintenance costs need to be factored into the total costs of the project and resourcing requirements.

Regular maintenance of bicycle facilities is required to ensure an optimal level of service to riders and to maximise the benefits of the capital investment in cycling facilities.

Planned maintenance work for road and footpath assets is identified and managed as per the *City Wide Maintenance Policy 2008*. This document defines the criteria against which defects and condition are prioritised for works. Implementation of the policy includes inspection, assessing the condition against failure/breakdown experience, prioritising, scheduling, actioning the work and reporting what was conducted, to develop a maintenance history and improve maintenance and service delivery performance. Ride quality of road blocks is measured by roughness surveys using a laser profiler mounted on a survey vehicle to produce a roughness count for each block. The policy dictates that road assets will be inspected at least once every two years and significant parks once per year. Footpaths, shared paths within the road reserve and on road assets are covered by this policy. However, off road shared paths are not. Also of relevance is the point that the cycleway assets included in these categories are not being managed specifically as cycleways. Changes to the asset management regime should be investigated to ensure that the specific features of cycling infrastructure are addressed. The riding surface ideally should be maintained in a smooth condition, free of potholes and debris. A maintenance program should cover inspection of signage, landscaping and tree overhang along the route. Changes to the asset management framework will require negotiation and will likely have impacts on Council's long term resourcing and financial strategies.

In addition to the audit of facilities outlined previously, a standard practice of assessment of cycling facilities and determination of capacity for upgrade, as part of implementation of scheduled road surfacing or reconstruction projects, is to be implemented.

Council will consult with the RMS for roads under their control to facilitate a consistent approach to addressing the above maintenance issues.

4.5.1 Reporting of cycle hazards

The *NSW BikePlan* proposed establishment and maintenance of a comprehensive source of NSW Government bicycle information (NSW Government, 2010, p. 20). The new web site http://www.bicycleinfo.nsw.gov.au provides a variety of resources for individuals and organisations. It includes a page for reporting of cycle hazards, at http://www.bicycleinfo.nsw.gov.au/cgi-bin/index.cgi?action=reporthazard.form. Information on the location, type of facility, nature of the problem and timing is requested, for forwarding to the relevant road authority, being Council or the RMS.

A similar system could be considered for Newcastle for public reporting of cycleway maintenance needs. As cycleways have a high level of public engagement this should work well for Council.

An example of good practice, in which temporary signage alerts riders to changed conditions.

REF.	ACTIONS	COMMENT, RESOURCES	RESPONSIBLE SERVICE UNIT, PRIORITY	STAKEHOLDERS
Strategy Direction: Provide a safe, continuous and convenient bicycle network.				
4.1	Implement augmentation of the bicycle network in accordance with the Works Program shown in Appendix 4.	*NSW BikePlan* actions 2.2, 2.16, 2.17. In progress. Some high priority works included in *Delivery Program 2011/2012 – 2014/2015 and Operational Plan 2011/12*. Project funding to be determined in preparation of future operational plans.	IMS, PRS Ongoing	RMS
4.2	Develop a priority rating system to assist in prioritising future infrastructure works.	Operational	IMS, PRS High	CWP
4.3	Undertake a full audit of existing infrastructure. Audit to include items such as lane and path widths, pavement markings and signage, route connectivity, bollards, drainage grates, intersection treatments, conflict points, end of trip and mid-trip facilities, etc. Identified works to be included in the Works Program.	In progress.	IMS, PRS High	
4.4	Identify and investigate locations where there is conflict between motor vehicles, cyclists, pedestrians and other users, and develop solutions.	Specific locations to be identified through audit process. Operational	IMS, PRS High	RMS
4.5	Prior to implementation of scheduled road surfacing, relinemarking or reconstruction projects on roads, Council and the RMS undertake an assessment of provisions for cyclists and determine capacity for upgrading of facilities (such as reallocation of space, linemarking, physical separation of cyclists and motorists).	*NSW BikePlan* action 2.19. Action statement is consistent with RMS policy. Operational	RAMS, IMS High	RMS
4.6	Ongoing development and installation of directional and destination signage in accordance with relevant standards that is clear, consistent and does not result in unnecessary clutter.	Funding allocation for development of a suite of route signage included in the *Management Plan 2010/2011* and the *Delivery Program 2011/2012 – 2014/2015 and Operational Plan 2011/2012*. Ongoing funding required.	IMS, PRS High	RMS

REF.	ACTIONS	COMMENT, RESOURCES	RESPONSIBLE SERVICE UNIT, PRIORITY	STAKEHOLDERS
4.7	Negotiate level of service agreements for ongoing maintenance and asset management of cycling infrastructure.	Maintenance is currently carried out in accordance with the *City Wide Maintenance Policy 2008*. Operational	IMS, PRS, RAMS High	RMS
4.8	Investigate web based system for reporting of required maintenance.	*NSW BikePlan* action 2.12. Operational	CSCCS, RAMS Medium	RMS
4.9	Investigate feasibility of physically separated bike lanes, from Newcastle Showground to Newcastle East.	Investigation of inner city bike lanes initiated. Funding allocated.	SPS High	
4.10	Review road speeds for the current and proposed bike network.	*NSW BikePlan* action 2.8. RMS approval required for speed changes. Operational	IMS Medium	RMS
4.11	When road works and local area traffic management schemes are undertaken, examine opportunities to increase priority for cyclists and pedestrians.	Operational	IMS Ongoing	
Strategy Direction: Enhance support infrastructure, such as end of trip facilities.				
4.12	Undertake audit and mapping of bicycle parking.	Audit to include note of type, location, condition, number of facilities etc. Audit commenced. Operational	IMS Medium	
4.13	Consider opportunities to create and develop rest points along routes, and provide bike parking, seating and drinking fountains at these points. Where appropriate, list for future funding.	Adequacy of rest points to be assessed as part of audit. Funding required for implementation. Operational	IMS, PRS Medium	
4.14	Investigate town centre public bike share or rental schemes and their feasibility for Newcastle.	*NSW BikePlan* action 2.11. Preliminary investigations could be undertaken within operational budgets.	SPS Low	RMS

5. Promotion and Education

5.1 Promotion

Promotion of cycling is integral to raising community awareness of its benefits, potential substitution for car trips and the perception of cycling in general. There is a vast amount of material readily available regarding the health, environmental, social and economic benefits of cycling.

Improved cycling infrastructure is a primary enabling factor for increased participation in cycling. Promotion of new facilities and the coordinated provision of related information should be factored into work programs. This could include web updates of completed works, and preparation of individual route maps, with details of support infrastructure, as works on that route are completed.

Information on shared pathways throughout the Lower Hunter is currently included in the Lower Hunter Transport Guide (LHTG), which is available on Council's web site and in hardcopy at Council offices and other centres throughout the region. It is intended that, in line with edits to the LHTG, changes to the network of off road paths are incorporated.

The route maps included in the *Newcastle Cycling Strategy and Action Plan* will be used as the basis for preparation of an updated bike map/brochure for the city.

Events such as Bike Week provide opportunities to raise general community awareness about cycling. Council has regularly supported this event and others, such as Ride to Work Day, however, there is scope to increase involvement and dissemination of related information.

Opportunities for promotion of cycling within Council are discussed in Section 6.

Cycle tourism

An area that has the potential to expand considerably is that of cycle tourism. In 2005, the Hunter Cycling Network initiated an investigation of cycle tourism in the Hunter Region, with the purpose to develop a report to guide development of a regional network of interconnected shared paths that provide cycle tourism opportunities. The consultants Ove Arup Pty Ltd were appointed to do the study. The report indicated that the region has potential for development of cycle tourism. Importantly, the report indicated that cyclists 'have a range of requirements which need to be met before cycle tourism can flourish. These include the provision of good cycle routes, typically quiet roads or designated shared paths, access to key tourist attractions, easily available information on routes, accommodation, attractions etc, storage and parking facilities and good public transport services (Ove Arup Pty Ltd, 2005, p. i).

The review indicated that the following general improvements were required to support cycle tourism in the region:

- construction of a number of long distance routes to accommodate multi-day cycle touring
- better linkages between existing cycling facilities to provide for longer cycling routes
- identification of 'quiet' roads for cycle tourism and improvements to these roads, for example, sealed shoulders, resealing rough surfaces, signage, linemarking.

Many of the other recommendations of the study, such as provision of information, promotion of the benefits of cycling, data collection and improvements in end of trip facilities, parallel actions outlined in this document.

5.2 Education

Multiple organisations and agencies have a role in cycling education. The RMS develops and delivers information resources, driver training education about bicycles, research and promotion of safety issues (for example, helmet wearing, lighting, clothing), and provides educational and research material for use by designers of roads and bicycle facilities. The Department of Education undertakes some cycle and road safety training as part of school based activities. Council undertakes some road safety education relating to safe cycling, through the Road Safety Officer. NCM also provides education for their members and to the wider community via their web site.

A dominant theme of responses to the Newcastle Voice survey was conflict between various users of the road and of shared pathways. The responses also indicated that many of the 'near misses' are not reported.

The literature indicates that there is no single conflict-generating mechanism on shared paths. Issues that may lead to conflict between pedestrians and cyclists may be related to path design and maintenance (the physical environment), user behaviour or the interaction between the two. Path design, signage and marking are discussed in Section 4. The range of measures that can be incorporated will be largely dependent on whether the path involves a retrofit/upgrade of an existing facility, the construction of a new facility in a greenfield area, the physical constraints and the anticipated usage.

Some research on pedestrian-cyclist conflict, such as the Austroads report *Pedestrian-Cyclist Conflict Minimisation on Shared Paths and Footpaths*, Austroads Research Report AP-R287-06 (Austroads Inc., 2006) and *Study of Bicyclist and Pedestrian Safety on Shared Paths* (Taverner Research, 2009) indicates that the perception of conflict on shared paths is greater than actual conflict events. A bad experience tends to be recalled more clearly than multiple uneventful occasions. Notwithstanding the actual incidence of conflict, there is much scope to improve users' perceptions, through various mechanisms.

Regulatory signage, advisory speed limits and enforcement are measures that can be used to address conflict. Improved infrastructure, such as wider paths and centreline marking will assist and are discussed in Section 4. However, everyone using the space has a responsibility to observe the rules and respect each other's right to use the path. Roller blades, skateboards, tricycles, scooters – all human-powered vehicles – are permitted on shared pathways. Motor powered personal transport generating less than 200W may also be used on paths by riders over 16 wearing a helmet. The range of users of shared paths display differences in characteristics such as speed, age, predictability, expectations and space requirements which may lead to conflict between them. Education is key, so that users know what to expect and behaviour to be observed.

Bicycle awareness and education programs targeting all road users are considered a high priority.

Specific actions to improve the use of shared paths include:

- Bell ringing - Bicycles are silent and take walkers by surprise. Bell ringing is interpreted by some as a rude or aggressive message 'Get out of my way!' while to others it is a courteous message 'Bike coming, don't be surprised'. Education and promotion of bell ringing as a polite message would be helpful. Cyclists need to be encouraged to use bell ringing more while pedestrians and other users of the path need to accept that it is intended to be a polite warning.
- Leashing of dogs and control of very young children, to keep them well within the left lane to allow safe overtaking.

REF.	ACTIONS	COMMENT, RESOURCES	RESPONSIBLE SERVICE UNIT, PRIORITY	STAKEHOLDERS
Strategic Direction: Promote cycling, special events and bike routes through a variety of media.				
5.1	Review and enhance cycling information on Council's web site (www.newcastle.nsw.gov.au/discover_newcastle/local_walks/cycling_in_newcastle). Include information on main cycle routes, information on health, environmental and social benefits of cycling, cycling events and links to other resources.	Improve cross-referencing and currency of information. Operational	SPS, IMS, PRS, CSCCS Ongoing	
5.2	Target key destinations and user groups (including tourists, recreational, University students) and develop specific 'cycling access guides'. Consider publication as brochures or on the web.	Partner with organisations/user groups to produce material. Project funding required for printing.	SPS, CSCCS, PRS Medium	UoN
5.3	Promote and sponsor events including 'National Ride to Work Day', 'Ride 2 School Day' and 'NSW Bike Week'. Promote staff participation in events such as 'National Ride to Work Day'.	*NSW BikePlan* action 2.5. Several events and programs are currently sponsored, including NSW Bike Week. Promotion could be undertaken through Council's web site at low cost. Project funding required.	IMS, CSCCS, PRS Ongoing	RMS
5.4	Prepare detailed maps of cycleways in Newcastle for print and on-line publishing. Consider inclusion of maps on touch screens.	Project funding required for printing of maps.	SPS, IMS, PRS, Information Management Services Ongoing	
5.5	Collaborate with Lower Hunter Councils and the RMS to produce an updated brochure of routes throughout the Lower Hunter.	Project funding required.	SPS, IMS, PRS Medium	Lower Hunter Councils, RMS
5.6	Update information about off road shared pathways in future edits of the Lower Hunter Transport Guide.	Operational	SPS Ongoing	LHCTG

REF.	ACTIONS	COMMENT, RESOURCES	RESPONSIBLE SERVICE UNIT, PRIORITY	STAKEHOLDERS
5.7	Identify and promote cycle tourism opportunities. Note recommendations of previous cycling tourism reports, as referenced in this document.		TEDS, PRS Medium	Lower Hunter Councils
5.8	Investigate potential for Council to conduct cycle skills courses for employees and residents. Courses could include cycle maintenance, buying a bike and cycling for beginners.	*NSW BikePlan* action 3.7. Investigate opportunities for grant funding of cycling courses and partnerships with other Councils or agencies. Operational funds for investigation only.	IMS, CSCCS Medium	RMS, UoN, Lower Hunter Councils
5.9	Publish and promote codes of behaviour for on road and shared facilities.	*NSW BikePlan* action 3.4.	IMS	RMS
5.10	Undertake a specific driver/cyclist awareness campaign.	*NSW BikePlan* action 3.13.	IMS, CSCCS Medium	RMS
5.11	Investigate support of a bike festival in conjunction with local non government organisations. This could include a road race, stunt performance, mass participation cycling, bicycle themed art works and film festival.	Bicycle culture is synergistic with bicycle use. Funding required for implementation.	TEDS Low	CWP

6. Leadership and Advocacy

6.1 Leadership

Council has the potential to do much within its own gamut of operations to increase uptake of riding and to influence behaviour change in the wider community. At a broad level, decisions made in land use planning and in development control influence the ease with which non-motorised modes can satisfy user needs. In its staff policies and programs and internal communication, it can influence mode choice of its employees for the trips to, from and at work.

Establishment of a bike fleet for work related travel can provide a number of benefits. They can replace trips otherwise carried out by car, and so reduce emissions and costs; encourage exercise, with consequent health and well being improvements; potentially reduce car parking spaces and importantly, they send a message to the community about the culture of the organisation implementing the fleet. Information on issues to be considered, including management of risk, equipment, operating procedures and promotion, are described in the Bikefleet Toolkit site at http://www.travelsmart.gov.au/toolkits/bikefleets/index.html.

Council undertook a trial of use of bicycles for corporate business. Two bikes were made available to all interested staff for use on local journeys. Some difficulties were noted with the scheme and it is not currently operating.

In 2005, Council undertook a survey of staff who work in the City Centre to ascertain the factors which influenced travel choices. Results indicated that for trips to and from work, 55% drive to work by themselves, 11% car pool, 16% use public transport and 18% walk or ride a bicycle. Lack of facilities for cyclists was one of the factors deterring people from walking and cycling more. A majority of respondents considered that the existing facilities in their area of work were either non-existent or inadequate. Comments indicated that more showers (particularly for women) and lockers are required. The level of provision was regarded as inadequate for the level of use, particularly considering that some buildings do not provide any facilities at all.

6.1.1 Staff training

Ongoing staff development is essential to ensure familiarity with current legislation and standards and build awareness of innovative practices in other areas. This is particularly important for those staff members involved in concept development.

6.2 Advocacy

Various issues raised by members of the community through consultation processes are not within Council's direct responsibilities. In such cases, Council's role becomes one of advocacy. Integration of cycling with public transport was a major theme of consultation undertaken as part of the Newcastle 2030 process, specifically the provision of bike parking at public transport nodes and the ability to carry bikes on buses and trains. The combination of multi-mode travel where people cycle to interchanges and transfer to public transport can substantially increase the range of bicycle travel.

There has been a long-standing Commonwealth planning and funding bias towards roads at the expense of other modes. As noted in 'The slow road from rhetoric to reform: an analysis of road pricing in Australia' (Denniss et al, 2004), the structure of the tax system can play an important role in either promoting or discouraging sustainable transport use. The City of Newcastle supports review of Commonwealth taxation policies to enhance achievement of transport objectives.

REF.	ACTIONS	COMMENT, RESOURCES	RESPONSIBLE SERVICE UNIT, PRIORITY	STAKEHOLDERS
Strategic Direction: Encourage and support cycling as a mode of transport for Council staff.				
6.1	Update Council policies to facilitate greater bicycle use for staff, including modification of the *Leaseback Vehicle Policy* to include alternatives to car lease.	Operational	HRS, ELT High	
6.2	Promote the availability of bikes for use by Council staff during office hours.	OHS issues to be addressed. Operational	ECCS Ongoing	
6.3	Prepare a green travel plan for Council staff. Consider inclusion of an incentive program for employees who ride to work.	Operational	SPS Medium	
6.4	Investigate the potential to refurbish Council offices/premises to include additional facilities for bike storage, change rooms and showers.	Funding required for implementation.	SPFMS, CES Medium	
6.5	Ascertain interest in establishing a Council staff Bicycle User Group.	Operational	CSCCS Medium	
6.6	Provide visitor bike parking details for Council premises, such as the City Administration Centre, on Council's web site.	Operational	CSCCS Medium	
Strategic Direction: Foster staff development.				
6.7	Support training course, conference and workshop participation for Council staff involved in road planning, design, development assessment and maintenance, to increase awareness and understanding of needs and standards for cyclists.	Staff involved in design, approval and maintenance areas have undertaken training courses and attended conferences. This is to continue. The Bike Futures conference is particularly valuable. Operational	HRS, ELT Ongoing	
Strategic Direction: Advocate for improved bicycle accommodation on public transport and measures to support active transport.				
6.8	Advocate to TfNSW and Newcastle Buses & Ferries to modify buses to allow carriage of bikes.	Operational	SPS Ongoing	Newcastle Buses & Ferries, TfNSW

REF.	ACTIONS	COMMENT, RESOURCES	RESPONSIBLE SERVICE UNIT, PRIORITY	STAKEHOLDERS
6.9	Advocate to RailCorp to allow for greater provisions for cyclists on trains, including the carriage of bikes on trains without charge, and for secure storage facilities at stations.	Operational	SPS High	RailCorp, TfNSW
6.10	Advocate to the Federal Government for changes in the tax system to promote active transport and public transport use.	Operational	SPS Ongoing	Federal Government
6.11	Advocate for inclusion of a cycling component in regional transport strategy documents, including identification of bike park and ride nodes and provision of facilities at these nodes.	TfNSW is currently preparing a long term transport master plan for NSW. Operational	SPS Ongoing	TfNSW
6.12	Advocate to TfNSW for comprehensive presentation of HTS data and cycling statistics for the Newcastle SSD (Lower Hunter Region), as is undertaken for the Sydney SD.	Operational	SPS Ongoing	TfNSW, BTS
6.13	Liaise with NSW Police to establish direct reporting of detailed information on bicycle crashes. Identify danger spots.	Purpose is to monitor safety as bicycle use increases. Operational	IMS	RMS, NSW Police
6.14	Liaise with the private sector to encourage delivery of adequate cycling support infrastructure.	Requirements for bike parking and end of trip facilities in new development are set by the NDCP. Council's role in retrofitting of facilities in the private domain is generally limited to advocacy. Operational	SPS Ongoing	Private sector

7. Planning for Active Transport

Through its development control function, Council can influence the way people move around. At a broad level, the location of trip attractors such as schools, shops and employment, their density and mix, in relation to where people live, affects the length of day to day trips and so how much the car is used to get around. The density of development and the mix of uses are important elements in creating neighbourhoods that facilitate active transport such as walking and cycling. Accessible centres (from city centres through to neighbourhood centres and corner shops) provide a focus for a mix of uses and walking, cycling and public transport routes, thus reducing the number of trips required, especially by car.

Compact subdivisions, integrating a mix of land uses such as residential, open space and neighbourhood commercial outlets, allow people to walk and cycle shorter distances and undertake multiple activities within the one trip. The provision of a modified grid pattern that minimises cul-de-sacs and dead end streets, with clear hierarchy and footpaths on both sides of the street that link with activity nodes and centres, facilitates active transport. Conversely, a street layout comprising multiple cul-de-sacs limits direct access, discouraging walking and cycling to undertake relatively short trips, in favour of using a motor vehicle.

The *Newcastle Urban Strategy* describes the principles which guide development in Newcastle. The principles mean new development should:

- provide buildings and places that are scaled for the pedestrian
- improve access for all people, including those who are socially, culturally, physically or economically disadvantaged
- help to accommodate public transport, walking and cycling as alternatives to the car as well as accommodating the need to move goods around the city and region for commerce and industry by road and rail
- create or contribute to a highly inter-connected street system offering improved pedestrian, bicycle and traffic efficiency, a pleasant environment and increased opportunities for social and economic exchange between people
- contribute to incremental development of urban villages that will have higher employment and residential densities than post-war suburban development
- acknowledge Newcastle is part of a hierarchy of interrelated and inter-dependent neighbourhoods, districts and cities of the Lower Hunter. Development must therefore fit within this urban context.

The *Newcastle Urban Strategy* is primarily implemented through the NLEP 2012 by land use zoning and density controls. The specific guidelines for new development in the city are detailed in the NDCP, in elements covering subdivision design, movement networks and parking and access. The NDCP references such documents *Planning Guidelines for Walking and Cycling* (DIPNR, 2004).

Much of the focus of current and future development in the city is infill development and redevelopment of existing sites, rather than the creation of new neighbourhoods in greenfield areas. Facilitation of cycling in such development can be supported through good design and the provision of appropriate end of trip facilities and preparation of green travel plans, for example. The level of provision (and pricing) of car parking in new development also influences the mode choice.

End of trip facilities include those that cater for the needs of both the cyclist and their equipment and include:

- conveniently located bike parking areas
- secure storage areas
- lockers, for clothing and accessories such as helmets

- change rooms and showers for men and women.

The type and level of bike parking should be relevant to the destination and trip purpose. As detailed in *Planning Guidelines for Walking and Cycling* (DIPNR, 2004) bicycle parking takes the form of a rack, locker or enclosure, or a combination of these, such as a rack within an enclosure.

Class	Security level	Description	Type of use
1	High	Bicycles stored within fully enclosed individual lockers fitted with high security door locks.	Transport interchanges, commercial buildings and remote (unsupervised) public locations. Recommended for regular and longer-term storage.
2	High to medium	Bicycles locked to rack within a security room, enclosure, compound or cage.	Regular use by company employees. Users need to have a key to the enclosure and provide their own lock to secure the bike to racks within the enclosure.
3	High to low	Bicycles locked to high quality racks in public area. Users provide their own locking device. Level of security dependent on level of supervision.	Casual and medium-term use by staff, customers and the general public.

Table 10: Bicycle parking types
Source: *Planning Guidelines for Walking and Cycling* (DIPNR, 2004, p. 48)

In 2009, Council adopted a revised parking element of the NDCP 2005. The revised element includes specific provisions for bike parking and shower and change facilities in new development throughout the city. Controls relating to siting, security class and level of provisions are included. The element also includes the requirement for major development to produce a green travel plan. The provisions have been incorporated in the NDCP 2011.

By current standards of provision, older building stock is generally significantly deficient in end of trip facilities. In the Newcastle City Centre in particular, which is a major employment node, consideration should be given to the feasibility of a centralised facility offering secure parking, showers and change rooms.

As noted in the previous section, the combination of cycling with other modes of travel, such as bus and train, can substantially increase the range of bicycle trips. In its own developments and through development control, Council can facilitate interchange between modes, through ensuring well located, adequate parking provision.

REF.	ACTION	COMMENT, RESOURCES	RESPONSIBLE SERVICE UNIT PRIORITY	STAKEHOLDERS
Strategic Direction: Facilitate active transport in new development.				
7.1	Ensure major new development is required to prepare green travel plans in accordance with the NDCP.	Requirement for green travel plans is included in NDCP. Operational	DBS Ongoing	
7.2	Require provision of end of trip facilities including bicycle parking in accordance with the NDCP.	Requirements for bike parking, lockers and showers for new development are listed in *Element 4.01 Parking and Access* of the NDCP 2005 (*Section 7.03 Traffic, Parking and Access* of NDCP 2011). Operational	DBS Ongoing	
7.3	Update list of cycling infrastructure projects in Council's section 94A and section 94 contributions plans.	Review of section 94 contributions plans initiated. Project funding allocated.	SPS High	
7.4	Ensure shared pedestrian and cycle paths and routes are provided for new development areas in accordance with the NDCP and the *Newcastle Cycling Strategy and Action Plan.* Ensure connectivity to regional and local routes.	Operational	DBS Ongoing	
7.5	Ensure provision of cycling routes and infrastructure is considered in preparation of locality based development control plans and area plans.	Operational	SPS Ongoing	
7.6	Ensure *Planning Guidelines for Walking and Cycling* (DIPNR, 2004) and PCAL's Development and Active Living Resource www.pcal.nsw.gov.au/__data/assets/pdf_file/0007/99943/PCAL_Final_web-v1_6.pdf are considered when new LEPs, DCP elements, development contribution plans and masterplans are prepared.	*NSW BikePlan* action 4.2. Operational	SPS Ongoing	
7.7	Ensure future proposed cycle paths are reserved.	Local and regional routes are to be considered.	SPS,	

REF.	ACTION		COMMENT, RESOURCES	RESPONSIBLE SERVICE UNIT PRIORITY	STAKEHOLDERS
	Investigate listing proposed bike routes on section 149 certificates.	Operational		Information Management Services Medium	
7.8	Investigate viability of a public cycling facility in the Newcastle City Centre which includes showers, change facilities, and lockers close to groupings of major employers.			SPS Low	Private sector, UoN

8. Monitoring and Review

Monitoring of trends is essential to assess the effectiveness of improvements to infrastructure and education and promotion programs in enhancing attitudes to cycling and increasing participation. Council will liaise with TfNSW, the RMS, Bicycle NSW and local cycling groups to improve data collection and monitoring.

Additional information, other than census data and that available through the Bureau of Transport Statistics, will be required to provide a clearer picture of the impacts of actions undertaken, and the proportion of cycling that is undertaken for transport (or utilitarian purposes), as opposed to recreational cycling. It is proposed to undertake a series of counts, at six-monthly or yearly intervals (depending on resources) to supplement mode share data available through the Bureau of Transport Statistics. Implementation of a standard practice of including bicycle counts when pedestrian and traffic counts are undertaken will also assist in building a more comprehensive picture of cycling participation in Newcastle.

The Super Tuesday project, an annual bike commute count, is an initiative of Bicycle Network Victoria. It is carried out on a Tuesday morning (7.00am to 9.00am) in March. The count observes and records rider numbers and movements at key intersections and important commuter routes in the morning peak. Bicycle count information is published on Bicycle Network Victoria's web site, subject to consent from participating Councils. In 2010, the count was carried out across six states, and involved 33 Councils with data collected from 880 sites across the country. The City of Newcastle participated in the March 2011 count. As noted, there are few comprehensive sources of data for cycling in Newcastle. Participation in Super Tuesday is a relatively straightforward and cost-effective means to initiate data development and trend analysis for commuter cycling in Newcastle.

Further information will be collected through periodic survey of the Newcastle Voice community reference panel. As with the survey undertaken to inform this document, ongoing survey of the reference panel will be used to gain an understanding of attitudes to cycling and their participation in cycling.

Council undertook a survey of travel patterns of staff in 2005. The focus of the survey was method of transport for journey to work, and investigation of the factors that discourage staff from using modes such as public transport and cycling and incentives for travel behaviour change. The survey had a good response rate and could serve as an indicator of the effectiveness of in-house measures to promote increased use of cycling.

The Cycling Working Party will continue to operate, with a change in emphasis of its terms of reference from preparation of a cycling strategy and action plan, to monitoring of its implementation and future review. Tracking of implementation should cover staff allocation to specific projects, referencing of relevant documentation, budget submissions and successful allocations, and project tracking.

Preparation of a bicycle account is one way to monitor progress towards implementation of objectives. An account measures the actual and perceived progress made, by reporting on actions undertaken and by investigating attitudes to various aspects of cycling. An example of a bicycle account is that published by the City of Melbourne[5]. Information typically included in a bicycle account covers:

- the number of riders on particular routes
- mode share
- accident statistics
- parking provision

[5] Refer to http://www.melbourne.vic.gov.au/ParksandActivities/ActiveMelbourne/WalkingCyclingandSkating/Pages/MelbourneBicycleAccount.aspx for further information.

- length, width and condition of bike facilities.

Production of an account biennially will assist in maintaining focus. Highlighting of issues at that point will also facilitate Council's early attention to any required changes.

REF.	ACTIONS	COMMENTS, RESOURCES	RESPONSIBLE SERVICE UNIT, PRIORITY	STAKEHOLDERS
Strategic Direction: Develop measures to monitor implementation of actions and progress towards nominated targets.				
8.1	Determine key locations to monitor trends in bike use and implement a program of cycle data collection at nominated points. Investigate options for data collection, including volunteers, partnerships.	*NSW BikePlan* actions 6.7 - 6.11. Funding required to undertake counts.	IMS, SPS High	CWP, NCM
8.2	Implement bicycle counts as standard practice, whenever traffic and pedestrian counts are undertaken.	Operational	IMS Ongoing	RMS
8.3	Participate in Super Tuesday bicycle count (as organised by Bicycle Network Victoria and undertaken in March each year).	Participation involves costs of approximately $4000. Costs can be accommodated within operational funds.	SPS, IMS Ongoing	Bicycle Network Victoria
8.4	Request BTS to provide mode share details for trips of 0-2km, 2-10km and greater than 10km, to track progress against *NSW 2021* and *NSW BikePlan* targets.	Customised requests to the BTS incur costs, however these can be accommodated within operational budgets. Data to be requested on a yearly basis in line with HTS release.	SPS Ongoing	BTS
8.5	Undertake a staff travel survey on a yearly basis.	Operational	SPS, CSCCS Medium	
8.6	Liaise with major employers in Newcastle to encourage survey of staff travel patterns, to supplement mode share data.	Operational	SPS	UoN, HNEH
8.7	Survey residents on cycling participation, attitudes etc. through yearly Newcastle Voice survey. Differentiate between cycling for utilitarian and recreational/sporting purposes.	Operational	CSCCS Ongoing	
8.8	Prepare a summary statement of actions completed by Council, on implementation of the *Newcastle Cycling Strategy and Action Plan*, on a two-yearly basis as part of the proposed bicycle account.	Operational	SPS High	CWP

REF.	ACTIONS	COMMENTS, RESOURCES	RESPONSIBLE SERVICE UNIT, PRIORITY	STAKEHOLDERS
8.9	Prepare a bicycle account every two years. Establish the basic form of the bicycle account, covering cycling patronage on specific routes, mode share, cycling infrastructure, injury data, and the monitoring regime and sources required to inform the account, by June 2012.	Preparation of the document can be undertaken with existing resources however funding is required to collect data (refer to Action 8.1).	SPS High	CWP
8.10	Undertake a review of the *Newcastle Cycling Strategy and Action Plan* approximately five years after its adoption.	Operational	SPS Medium	CWP

9. Implementation and Funding

9.1 Implementation

9.1.1 Service unit structure and cycling projects

Multiple service units within different directorates in Council contribute to cycling outcomes in Newcastle. Council's Infrastructure Management Services is the unit with primary responsibility for the design and delivery of hard measures (bike lanes, shared paths, signage etc.). The design and delivery of pedestrian facilities and traffic management works, which impact on the cycling environment, implementation of Council's *Road Safety Strategic Plan* and asset management planning, are also led by this unit. Development of shared paths within reserves is undertaken by the Parks and Recreation Services unit. The Development and Building Services unit can facilitate good neighbourhood design in new subdivisions and the incorporation of appropriate end of trip facilities in new development, through its development assessment role. Road and Asset Maintenance Services unit is responsible for maintenance of the assets in accordance with Council's asset management plans and *City Wide Maintenance Policy*. Strategic Planning Services and Customer Service, Communication and Consultation Services also contribute. Service units and directorates of Council are shown in Figure 4.

This document does not include any recommendations for restructuring of service units to facilitate the implementation of actions related to cycling. However, given the range of service units involved in delivery and the scope of actions listed, good communication and cross-directorate coordination and cooperation will be critical for effective implementation.

The allocation of staff resources within Council is critical to delivering the actions nominated in this document, and achieving the stated targets. In the short term, additional resources are required to complete the full audit of current infrastructure and undertake the preliminary work, such as preparation of concept plans, to position Council to take advantage of funding opportunities and facilitate delivery.

9.1.2 Cycling Working Party

Council's Cycling Working Party includes representatives from the University of Newcastle, Hunter Commuter Council, Newcastle Cycleways Movement, the RMS, community and Council officers from Infrastructure Management Services, Parks and Recreation Services and Strategic Planning Services. It was established with the primary purpose of developing a cycling strategy and action plan. It is proposed that the Cycling Working Party continue to operate as a working party reporting to Council's Transport Advisory Committee, with modified terms of reference to reflect an ongoing role in implementation of the strategy.

9.1.3 Lower Hunter Councils Transport Group

The Lower Hunter Councils Transport Group includes Councillors and officers from planning and infrastructure service units of the five Lower Hunter councils. Its primary objectives are to facilitate greater mode share to sustainable transport modes, such as cycling, and to promote the ready exchange and sharing of information relating to transport issues between Lower Hunter councils. As such, it provides a forum for discussion of cycling issues and a means of facilitating consistency in councils' policies across the region. The Lower Hunter Councils Transport Group also provides updates to the Transport Advisory Committee.

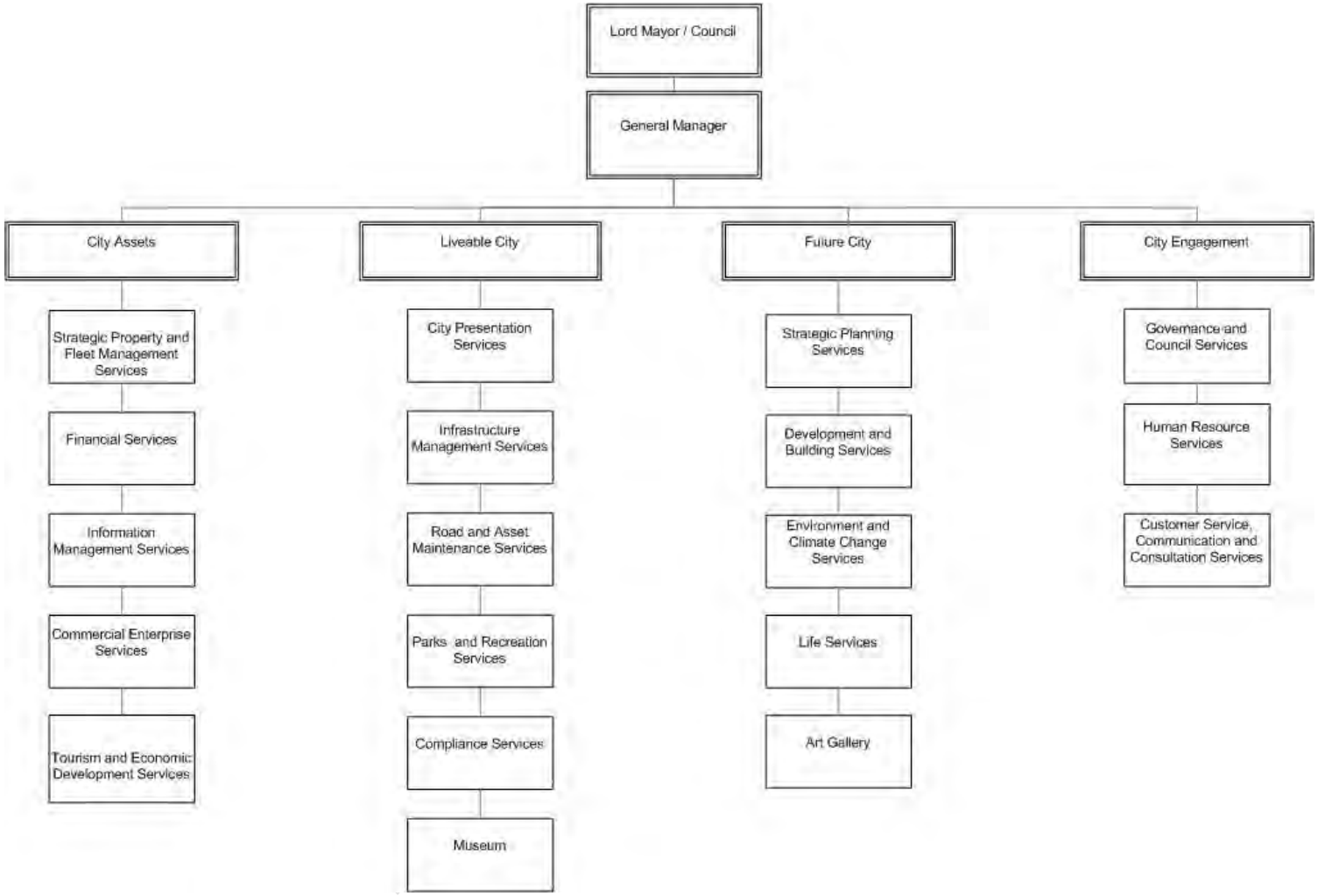


Figure 4: The City of Newcastle Organisation Chart

9.1.4 Relationship with resourcing strategies and delivery program

Under the integrated planning and reporting requirements, Council is required to prepare three resourcing strategies – a long term financial plan, asset management plan and a workforce management plan, in addition to the four-year delivery program and operational plan. In June 2011, Council adopted a funding scenario for delivery of key community infrastructure projects, including a cycleways program, which incorporates borrowing for its major asset preservation program and rate variation over 10 years. Modification of the rolling four-year delivery program to reflect the commitment to cycleways will be undertaken subsequent to approval of the rate variation. The Works Program (Appendix 4) is effectively the cycleways program to be part funded through the proposed rate variation.

The projects listed in the Works Program at Appendix 4 have indicative completion timeframes of short, medium and long term. The prioritisation/timing may change following completion of the network audit and refinement of the ranking process.

In the tables of actions from Sections 4 to 8, the responsible service unit or units and the indicative priorities for completion of actions are identified. Some actions listed will be undertaken within operational budgets, as noted, through incorporation in officers' work programs. Other actions require project funding and will be considered and prioritised against other Council activities in preparation of future operational plans and delivery programs.

Several of the actions listed have implications for resourcing levels – such as changes to maintenance regimes, design and construction works. Once determined, the proposed changes will be incorporated in future iterations of the resourcing strategies and reported to Council.

Liaison with other councils and major stakeholders, such as the University of Newcastle, may provide opportunities for joint implementation of projects.

9.1.5 Related programs

There are works undertaken by Council under various programs that, although not specifically cycling projects, do provide benefits for bike riders. Implementation of 40 km/h high pedestrian area activity zones generally involve installation of associated traffic calming works, which improve the cycling environment. Shoulder widening works, resurfacing and linemarking funded under roads programs, PAMP works such as footpath, refuge and crossing installations and local area traffic management works generally improve conditions for cyclists too.

9.2 Funding

Actions listed will be funded through a combination of Council funds (operational budgets, major projects, contributions plans funds, allocation to the Major Asset Preservation Program) and grant funding. Road, footpath and shared path maintenance and rehabilitation, linemarking and bollard removal are covered under the Major Asset Preservation Program.

The RMS funds the position of Council's Community Road Safety Officer, who has responsibility for development and implementation of Council's *Road Safety Strategic Plan* and a key role in delivery of educational and behavioural change programs.

9.2.1 Developer contributions

Where proposed projects are required to meet community needs and have a direct nexus with increased development, they may be funded in part or full by developer contributions, subject to satisfaction of the relevant legislation. These may comprise contributions under an adopted contributions plan (section 94, section 94A), voluntary planning agreement or works in kind.

Greenfield development in the Newcastle LGA is largely limited to the Blue Gum Hills planning district (from Wallsend through to Minmi). The proposed residential development of former mining areas owned by Coal and Allied and Xstrata and industrial development at Blackhill need to be managed carefully to ensure that that opportunities for active transport, and their integration with public transport, are maximised.

9.2.2 Cycleways grant funding

The State Government provides some funding for cycling infrastructure and cycling events. Through the RMS, the State Government offers funding under several different programs covering road repair, road safety, cycling and pedestrian and urban amenity, covered by a memorandum of understanding, which details criteria for funding.

The cycleways program offers funding for design and construction of new on and off road cycleways, in line the State and local bike plans, that increase the level of network availability. Projects submitted under this program must be part of an identified transport network, so closed recreational circuits are not eligible.

Part funding may also be available from the RMS under the Bicycle Facilities program, which includes proposal categories of localised improvements to the operation of existing cycleways, improved bicycle detection at traffic signals, replacement of unsafe drainage grates and the Bicycle User Support Program, for contributions to bicycle use promotions, preparation of maps and training courses.

Funding under these programs is generally provided on a 50%-50% basis. To date, projects have been submitted to Council's budget planning process on the condition of matching funding by the RMS.

Additional funding sources have become available to councils for expansion of tourist and recreational cycling opportunities. For example, Council has been successful in securing funding from the Department of Planning for work on various stages of the NSW Coastline Cycleway on a 50% - 50% basis.

Recently, grants have become available through the Federal Government's Regional and Local Community Infrastructure Program and the Jobs Fund.

The Federal Government also provides funding under its Nation Building Program – Roads to Recovery component (administered by the Department of Infrastructure, Transport, Regional Development and Local Government) and Black Spot program (administered by the RMS). These programs are 100% grant funded.

Programs may have a limited life and funding cycles and timeframes may not coincide with Council's budget processes. Clarification of the rolling delivery program and good communication will assist Council in maximising funding opportunities.

9.2.3 Roads funding - State, Regional and Local Roads

A road may have a legal classification under the *Roads Act 1993* and an administrative class of State, Regional or Local under the RMS. State Roads are the major arterial links throughout NSW and within major urban areas. The RMS funds and manages the State Roads (lanes, traffic lights, roundabouts, signs and linemarkings). Council retains responsibility for the road reserve of State Roads, including service roads and footpaths, unless otherwise agreed by the RMS. Parts of the following State Roads are within the Newcastle LGA:

- New England Hwy
- Pacific Hwy
- Highway 23 (Inner City Bypass) - from the Pacific Hwy at Windale via West Charlestown Bypass, Charlestown Rd, Lookout Rd and Croudace Rd to Newcastle Rd

at Lambton, then from Newcastle Rd at Jesmond to Sandgate Rd at Shortland then via Sandgate Rd to the Newcastle – Maitland road (Pacific Hwy) at Sandgate

- Main Road 82 from Stewart Ave at Newcastle via Parry St, Gordon Ave, Donald St, Griffiths Rd, Newcastle Rd, Thomas St and the Newcastle Link Rd to the Sydney - Newcastle Freeway at the Newcastle Interchange near Minmi
- Main Road 108 - from Industrial Dr at Mayfield North via Tourle St, Cormorant Rd, Teal St, Stockton Bridge, Fern Bay, Williamtown and Salt Ash to the intersection of Marooba Cr and Church St at Nelson Bay
- Main Road 217 - from the Sydney - Newcastle Freeway at Morisset Interchange at Mandalong Rd via Morisset, Toronto and Cockle Creek to Glendale, then via Lake Rd to Thomas St at Wallsend
- Main Road 302 - from the Newcastle - Nelson Bay road (MR108) via Tomago to the Pacific Highway (SH10) near Hexham
- Main Road 316 - from Hunter St at Newcastle West via Stewart Ave, Hannell St and Industrial Dr to the Newcastle - Maitland road at Mayfield West
- Main Road 326 - from the Newcastle - Swansea road at Adamstown Heights via Northcott Dr, Bridges Rd, Turton Rd, Station St, Platt St, Railway Tce, Hanbury St and Vine St to Industrial Dr at Mayfield
- Main Road 588 - from the New England Hwy at Beresfield via John Renshaw Dr through Buchanan and Stanford Merthyr to Kurri Kurri, then via Mulbring St, Victoria St, Mitchell Ave and Northcote St to Weston, then via Cessnock Rd to Abermain, then via Maitland Rd to Vincent St at Cessnock
- Main Road 605 - from Industrial Dr at Mayfield West via Werribi St, Maud St, Lorna St, Queen St and University Dr to Hwy 23 at Birmingham Gardens.

The Works Program at Appendix 4 lists projects for these roads. Council will advocate to the RMS to fund these works progressively.

Regional Roads perform a sub arterial function in urban areas and are the responsibility of councils to fund and carry out works. Some funding assistance is provided by the State Government, through the RMS. Regional Roads that are partly or wholly in the Newcastle LGA are:

- Main Road 188 - from the intersection of Stewart Ave and Parry St at Newcastle West easterly via King St to Darby St, then southerly and westerly via Darby St, Glebe Rd, St James Rd, Royal Rd and Royal Pl, Lambton Rd and Howe St to Croudace St at Lambton, then northerly from Griffiths Rd at Lambton via Lambton Rd, Edith St and Lorna St to Maud St at Waratah West
- Main Road 223 - from Brunker Rd at Broadmeadow via Lambton Rd, Alma Rd, Rugby Rd and Russell Rd to the intersection of Lookout Rd and Croudace Rd at New Lambton, then from the intersection of Charlestown Rd and Lookout Rd at New Lambton Heights via Main Rd to Macquarie Rd at Cardiff
- Main Road 464 - from the intersection of Stewart Ave (Pacific Hwy HW10) and Hunter St at Wickham via Hunter St and Maitland Rd to the intersection of Industrial Dr (MR316) and Maitland Rd at Warabrook
- Main Road 603 - from Bridges Rd at New Lambton South via Carnley Ave to Charlestown Rd at Kotara
- Main Road 604 - from the Pacific Hwy at Adamstown Heights via Brunker Rd, Chatham Rd, Belford St and Tudor St to Maitland Rd at Hamilton
- 7769 Myall Rd - from Charlestown Rd at Kotara via Myall Rd to Macquarie Rd at Cardiff.
- 7770 McCaffrey Dr/Croudace Rd - from Lookout Rd at New Lambton Heights via McCaffrey Dr and Croudace Rd to Lake Rd at Elermore Vale

- 7772 Carrington Port Access Road - from the intersection of Industrial Dr and Hannell St (MR316) at Maryville via Elizabeth St, Parker St, Darling St and Robertson St to Bourke St at Carrington
- 7777 Merewether Heights - Newcastle East via Scenic Dr route - from City Rd (Pacific Hwy HW10) at Merewether Heights via Scenic Dr, Frederick St, Helen St, Memorial Dr, High St, Bingle St, Reserve Rd, and Watt St to Scott St at Newcastle East.

Local Roads are the responsibility of councils to fund and carry out works. The Federal Government provides financial assistance grants to councils that have a significant roads component. Federal funds may be used on any category of road.

Road reconstruction and rehabilitation projects can provide opportunities for improvement in the cycling environment. Consideration of cyclists' needs in maintenance works is embodied in RMS Technical Directions, in relation to linemarking, signs, shoulder sealing and gully grate upgrading.

Appendix 1 – Cycling Framework

Cycling Framework

NATIONAL

***National Road Safety Action Plan: 2009 and 2010* (Australian Transport Council)**

The *National Road Safety Action Plan: 2009 and 2010* highlights measures with potential to significantly reduce road trauma over the next few years and to lay the foundation for longer term gains. Action items are grouped into four broad areas:

- safer speeds
- safer roads and roadsides
- safer vehicles
- safer road users and safer behaviour.

***National Road Safety Strategy 2001 - 2010* (Australian Transport Council, 2000)**

This strategy aims to reduce the number of road fatalities per 100,000 population by 40 per cent by 2010. In Australia, road safety strategy and policy measures are principally driven by the States, Territories and local government who conduct their own comprehensive programs. The Commonwealth role is to collate statistics, conduct and coordinate research, fund National Highways and the treatment of black spots, regulate new vehicle standards and monitor vehicle safety recalls, and facilitate the sharing of ideas among stakeholders. Accordingly, this Strategy has been developed as a framework document which recognises the safety plans of the Federal, State, Territory and local governments and other organisations involved in road safety. Individual governments will continue to develop and implement their own road safety strategies and programs consistent with this Strategy but reflecting local imperatives. A series of two-year action plans have been developed that contain specific measures available to address each of the strategic objectives.

***The Australian National Cycling Strategy 2005 – 2010* (Austroads, 2005)**

The *Australian National Cycling Strategy 2005 - 2010* was developed as a coordinating framework identifying responsibilities of governments of all levels, community and industry stakeholders, to encourage and facilitate increased cycling in Australia, following review and renewal of *Australia Cycling: The National Strategy 1999 - 2004*. The focus in the new strategy is the identification and promotion of best practice. The vision for the revised strategy is more cycling, to enhance the well-being of Australians. The priorities for the strategy are:

- improving coordination of activities relevant to increased cycling in the appropriate portfolios of Australian, state, territory and local governments
- including cycling as an essential component in integrated land use planning in all spheres of government
- creating infrastructure and facilities that support increased cycling
- enabling and encouraging safe cycling
- providing leadership and developing partnerships to support and promote cycling in Australia
- developing the skills needed to undertake actions that will increase cycling.

For each priority, the strategy lists specific actions, with responsible organisations, target completion dates and resourcing identified. The implementation of the strategy is overseen by the Australian Bicycle Council, established under the previous strategy. The Australian Bicycle Council reports directly to the Austroads Council and through it to the Standing

Committee on Transport and the Australian Transport Council. The strategy also tasks the Australian Bicycle Council with development of a monitoring framework for the strategy. The resourcing of the strategy draws extensively on all spheres of government, using existing staff and funding programs unless there has been a specific provision indicated in the strategy.

***The Australian National Cycling Strategy 2011 – 2016* (Austroads Ltd, 2010c)**

The overarching vision is to realise a step-change in attitudes to cycling and in the numbers of riders in Australia. In the short term, the goal is to double the number of people riding by 2016. *The Australian National Cycling Strategy 2011-2016* sets out a framework of six key priorities and objectives, listed below.

- Cycling Promotion – Promote cycling as both a viable and safe mode of transport and an enjoyable recreational activity.
- Infrastructure and Facilities – Create a comprehensive network of safe and attractive routes to cycle and end of trip facilities.
- Integrated Planning – Consider and address cycle needs in all relevant transport and land use planning activities.
- Safety – Enable people to cycle safely.
- Monitoring and Evaluation – Improve monitoring and evaluation of cycling programs and develop a national decision-making process for investment in cycling.
- Guidance and Best Practice – Develop nationally consistent technical guidance for stakeholders to use and share best practice across jurisdiction.

These key priorities have generic actions that can be applied within states, territories and local governments in accordance with community aspirations, priorities and available resources.

STATE

***Action for Bikes : BikePlan 2010* (RTA, 1999)**

Action for Bikes sets out a costed, 10 year plan for the creation of a series of arterial bicycle networks across NSW. The $251 million program outlined in the plan aimed to create an average of 200km of cycleways across NSW each year. Key directions include:

- improving the bicycle network
- strengthening the funding and budgeting process
- raising awareness within the Government of the needs of cyclists
- improving safety for cyclists
- improving personal and environmental health
- raising community awareness.

***Action for Transport 2010 - An Integrated Transport Plan for NSW* (Department of Transport, 1998)**

Action for Transport 2010 outlined the NSW Government's commitment to providing transport alternatives that make it easier and more convenient for people to get to the places where they want to go; and reduce the rate at which the demand for car travel increases in the future, thereby helping to improve air quality. Preparation of a bike plan for NSW was one of the key actions of *Action for Transport*. (Note: A long term transport master plan for NSW is currently being developed. Refer to the web site http://haveyoursay.nsw.gov.au/transportmasterplan.)

Cycling in New South Wales: What the data tells us **(Parsons Brinckerhoff Australia Pty Ltd, 2008)**

The report documents the results of an extensive review of data on who is cycling where and why across NSW, and associated issues such as road safety and bicycle theft. The report also identifies ways in which cycling data collection and management could be improved in NSW. Data has been collected to address the following:

- What data is available on cycling in NSW?
- Who is cycling in NSW?
- How does cycling in NSW compare to other locations?
- What is the potential to increase cycling in NSW? What further work is needed to plan and track cycling in NSW?

Cycling Policy **(National Parks & Wildlife Service, August 2011)**

Cycling, including mountain biking, is a popular and healthy recreational activity which can raise awareness, appreciation and understanding of the natural environment. NPWS aims to provide and promote an appropriate range of opportunities for ecologically sustainable recreational cycling. The cycling policy sets the framework for providing and managing cycling experiences in parks and has as its objectives:

- ecologically sustainable cycling in parks
- recreational cycling activities that provide a safe quality experience for all park visitors which fosters public appreciation, understanding and enjoyment of nature and cultural heritage in parks
- proactive and responsive management of cycling in parks
- effective communication between the park authority, cycling communities and other land managers.

It states that the extent to which cycling experiences are appropriate will be assessed on a park-by-park and location-by-location basis. The following principles will be used to guide decisions about the planning, development and management of cycling experiences:

- ecological sustainability
- appropriateness of the location
- provision of a quality experience for cyclists
- balancing competing visitor demands
- consideration of opportunities and demand for cycling across the region, including other land tenures
- protection of visitor safety
- availability of resources to provide and maintain the experience.

In all parks, cycling is not permitted off a road, trail or track. Cycling on tracks and cycling on roads or management trails in nature reserves and wilderness areas must be identified in the park's plan of management (except where transitional arrangements apply).

NSW BikePlan **(NSW Government, 2010)**

The *NSW BikePlan* is a whole-of-government initiative overseen by the Premier's Council for Active Living. It indicates that the NSW Government is committed to:

- lifting the share of short trips by bike in Greater Sydney for all travel purposes to 5%
- doubling the use of cycling to get to work across NSW as a whole.

The *NSW BikePlan* is about promoting cycling as a means of transport for everyday use and encouraging people to ride more often and more safely. It details the delivery of infrastructure projects for the next ten years, including:

- $78 million over 10 years to fast-track cycleway connections in Parramatta, Penrith and Liverpool
- $80 million over 10 years to build the key missing links in the Metro Sydney Bike Network
- at least $5 million each year to help local councils across NSW complete cycling networks.

The *NSW BikePlan* updates and replaces the NSW Government's 1999 *Action for Bikes: BikePlan 2010*.

NSW 2021: A Plan to Make NSW Number One **(NSW Government, 2011)**

A new State plan, *NSW 2021: A Plan to Make NSW Number One*, was released by the NSW government in September 2011, subsequent to the elections in March. *NSW 2021*, which may be downloaded from http://haveyoursay.nsw.gov.au/nsw2021, includes the target to more than double the mode share of bicycle trips made in the Greater Sydney region, at a local and district level, by 2016.

The document indicates that to increase walking and cycling to help ease transport congestion and build a healthier, more active community, the government will:

- complete the construction of the Metro Sydney Bike Network and work with local councils to complete local cycle networks as part of an integrated transport network
- develop and implement a NSW Walking Strategy to encourage and promote walking for travel and recreation, and to enhance walking environments in NSW.

Planning Guidelines for Walking and Cycling **(Department of Infrastructure, Planning and Natural Resources, 2004)**

The guidelines aim to assist land-use planners and related professionals to improve consideration of walking and cycling in their work. They are also designed to provide a planning complement to the RTA's facilities-focused policies and actions. The guidelines provide information on principles, background information, case studies and references to other supportive policies and guidelines which can be used to develop planning instruments, at all levels, that are supportive of walking and cycling. At the broadest level, these guidelines show how metropolitan strategies, masterplans and local environmental plans can help create an urban form that is conducive to walking and cycling. The guidelines show how Development Control Plans, developer contributions plans and development assessment processes can reinforce these broader plans through funding mechanisms, provision of facilities and design outcomes that are supportive of walking and cycling.

Sustainable Mountain Biking Strategy **(National Parks & Wildlife Service, 2011)**

The *Sustainable Mountain Biking Strategy* identifies priority projects across NSW, including Glenrock State Conservation Area. It includes actions to ensure mountain biking is well planned, safe, enjoyable and environmentally sustainable. Any identified new track routes must be approved through park plans of management and undergo rigorous environmental assessment, and be designed according to International Mountain Biking Association guidelines.

COUNCIL

***Newcastle Airshed Management Action Plan* (NCC, 2005)**

The air emission inventory completed by NCC in 2004 showed that industrial, domestic and transportation sources can all contribute to adverse air quality in the city. The aim of the *Newcastle Airshed Management Action Plan* (NAMAP) remains as it was specified in the original NAMAP in 1998, which is 'to improve air quality at the local and regional scales and to manage air pollutants, which may impact on global air quality'. The NAMAP seeks to achieve this through reducing the emission of those air pollutants from within the Newcastle airshed. The actions are grouped under nine key topics: council operations, energy efficiency, regional cooperation, land use planning, transport, vehicle emissions, business and industry, regulation and enforcement and community involvement. The key direction in relation to transport is to encourage the alteration of community preference in transport modes towards modes with lower emissions. Specific actions listed are:

- investigate and promote alternative lower emission transport strategies
- enhance and extend the bicycle network throughout the Newcastle LGA
- promote regional transport plans that enhance the use of public transport and reduce the reliance upon motor vehicles within the Newcastle area.

***Newcastle Community Strategic Plan* (The City of Newcastle, 2011)**

The *Newcastle Community Strategic Plan* reflects the community's vision for the city and is our guide for action. It contains:

- seven strategic directions for Newcastle
- 23 objectives to achieve over the next 10 years
- strategies to be implemented
- outcomes that will indicate that goals have been reached.

The desired directions that emerged from the shared planning process are:

- a connected city
- a protected and enhanced environment
- vibrant and activated public places
- a caring and inclusive community
- a liveable and distinct built environment
- a smart and innovative city
- open and collaborative leadership.

***Newcastle Environment Management Plan* (NCC, 2003)**

The *Newcastle Environment Management Plan* provides a set of principles, a process, and tools for action to be applied across Council's planning and operational activities. Based on a systems approach, the 2003 plan aims to connect the institutional, economic and social systems with the environment to ensure its viable health, and also to determine the effectiveness of planning and management efforts.

Specific actions include:

- integrate land-use and transport planning

- develop transport strategies which support the Newcastle Urban Strategy, the NLEP, GAIN Plan, Newcastle Lake Macquarie Bike Plan and PAMP
- review maintenance/designs/service levels for roads
- advocate for rationalisation/coordination of existing groups involved in transport planning
- foster partnerships between groups having an advocacy role and those with responsibility for planning, construction and maintenance of transport infrastructure
- carry out community education to encourage changes in transport choices such as modal choice, and fuel sources
- integrate port development, transport planning, conservation such as wildlife corridors and fish passage
- Council demonstrate leadership role through the use of alternative technologies and management practices.

Newcastle Lake Macquarie Bike Plan **(Cycle Planning Consulting Services, 1996)**

The *Newcastle Lake Macquarie Bike Plan 1996* provides a review of the 1981 *Newcastle Area Bike Plan*, extends the 1981 plan to cover Newcastle and Lake Macquarie and suggests a comprehensive and staged action plan for future cycle projects aimed at developing a safe and convenient cycleway network. New cycleway projects in the report comprise regional routes as part of a wide spaced grid (especially suited to commuting) and local routes that connect to local activities which are usually more suitable for families and novice cyclists. The two major off road routes that connect both Councils are listed as high priority: the Adamstown to Belmont route (the Fernleigh Track) and the Wallsend to Glendale route along a former tramway reserve.

Newcastle Recreation Plan 2006-2016 **(NCC, 2006)**

Encouraging walking and cycling, through the development of an expanded network of trails and paths, was one of the four priorities of the ten major key response areas identified in the project. Another key response area was convenient transport services and facilities. The key service strategies listed for the key response area of encouraging walking and cycling are:

- expand the network of off road trails, develop circuits, and construct park perimeter paths
- provide legitimate places to ride BMX and mountain bikes
- create a hierarchy of trails to serve cycling, skating, running, wheelchair use and children's activities
- plan trails through all residential development
- promote opportunities and routes to walk and cycle
- provide more opportunities for walking the dog.

For the key result area of convenient transport services and facilities, strategies include:

- promotion of public transport (especially accessible services)
- address car parking and its cost
- enhance sport and recreation opportunities in the North West and Blue Gum Hills
- develop off road cycling and walking paths
- manage the use of car parks, especially along the foreshore and beaches for recreation activities.

***Newcastle Urban Strategy* (Newcastle City Council, 1998) (Updated 2005, 2009)**

The *Newcastle Urban Strategy* was prepared as a local environmental study, in accordance with the requirements of the *Environmental Planning and Assessment Act 1979* and provides the basis for the NLEP and the NDCP. The *Newcastle Urban Strategy* outlines key strategies for achieving greater integration of transport and land use, based on the principles of Newcastle Urbanism. The principles mean new development should:

- provide buildings and places that are scaled for the pedestrian
- improve access for all people, including those who are socially, culturally, physically or economically disadvantaged
- help to accommodate public transport, walking and cycling as alternatives to the car as well as accommodating the need to move goods around the city and region for commerce and industry by road and rail
- create or contribute to a highly inter-connected street system offering improved pedestrian, bicycle and traffic efficiency, a pleasant environment and increased opportunities for social and economic exchange between people
- contribute to incremental development of urban villages that will have higher employment and residential densities than post-war suburban development
- acknowledge Newcastle is part of a hierarchy of interrelated and inter-dependent neighbourhoods, districts and cities of the Lower Hunter. Development must therefore fit within this urban context.

The *Newcastle Urban Strategy* notes Council's support of production of an integrated transport plan for the Lower Hunter region, to develop strategies relating to the provision of public transport, demand management, and the needs of pedestrians and cyclists. It also states Council's commitment to continual development of the cycling network, facilitation of storage of bicycles at transport nodes and promotion of 'green travel'. The provision of appropriate transport networks is a fundamental objective of the *Newcastle Urban Strategy*.

***Road Safety Strategic Plan 2002 - 2010* (NCC, 2002)**

The *Road Safety Strategic Plan 2002 - 2010* identifies issues and strategies related to: community involvement; transport and land use planning; safer people, roads and vehicles; coordination and communication. The key objectives of the plan are:

- improve road user behaviour and promote responsible road use
- encourage community support, participation and ownership of road safety data and the processes involved in improving it
- increase the priority of road safety in the management of the road network
- continue effective communication and increased coordination between stakeholders involved in road safety.

In relation to cycling, the primary strategy listed is to increase the safety of pedal cyclists as well as increasing the acceptance of pedal cyclists as road users. Specific actions listed are:

- increase driver awareness of pedal cyclists and advocate the concept of 'sharing the road'
- continue to promote cyclist safety during Bike Week
- implement an education program to promote the advantages of safety equipment for cyclists such as helmets.

Council is currently updating the *Road Safety Strategic Plan*.

Appendix 2 – Bike Routes

Bike Routes

This appendix provides a description of each proposed route, its connectivity and opportunities when complete, and a brief discussion of improvements and specific problems. In some cases, the proposed works are listed in terms of investigation, rather than construction. The indicative timeframe and cost listed for these works are for the investigation component only. Should investigation indicate that the proposal is feasible, the rolling Works Program will be updated to include indicative timeframe and costs for construction works.

Proposed regional, local and scenic/recreational routes are as follows:

	Regional Routes
R1	Adamstown Heights to Fern Bay
R2	Newcastle to Maitland
R3	Kotara – John Hunter Hospital – Sandgate
R4	Kotara to Tighes Hill TAFE
R5	Newcastle City Centre to Glendale
R6	Newcastle City Centre – University – Birmingham Gardens
R7	Fernleigh Tunnel to Newcastle City Centre
R8	Birmingham Gardens to Tarro via Hexham Swamp
R9	Minmi to Hexham
R10	Wallsend to Minmi
R11	Minmi to Beresfield
R12	Newcastle Link Rd to City Centre
R13	R2 (Industrial Dr at Tourle St) to Port Stephens

	Local Routes
L1	Lenaghans Dr to Maryland
L2	Maryland to Wallsend
L3	Wallsend to Jesmond
L4	Wallsend to New Lambton Heights
L5	Wallsend to Cardiff Rd (Lake Macquarie)
L6	Wallsend to Jubilee Rd (Lake Macquarie)
L7	Maryland Dr to Churnwood Dr Link
L8	University to John Hunter Hospital
L9	Lambton to H23 Kotara (R5 to R3)
L10	Callaghan to Georgetown (University to R6)
L11	Waratah to Lambton
L12	University to Warabrook (Pacific Hwy)
L13	Waratah to University via Warabrook
L14	Waratah Station to Mayfield East
L15	Mayfield to Mayfield North
L16	Broadmeadow to Georgetown
L17	Hamilton
L18	Adamstown to Hamilton South
L19	Hamilton South (Gordon Ave) to R5
L20	Stockton
L21	New Lambton to Fernleigh Track and Teralba Rd (R1)
L22	Tighes Hill TAFE – Hamilton
L23	John Hunter Hospital to R4/Turton Rd
L24	Merewether to The Junction
L25	Bar Beach
L26	Maryland Dr to Minmi Rd
L27	Merewether to Newcastle West/Throsby Creek Shared Pathway
L28	Waratah Local
L29	Carrington Loop to Hamilton
L30	Merewether Beach Link (R7 to Dixon Park)
L31	John Hunter Hospital to Wallsend Link

L32	Braye Park Links
L33	Minmi to Maryland Dr West
L34	Foreshore (S1) to King Edward Park (S1)
L35	Wharf Rd (Ferry Terminal) to Watt St
L36	R11 to Beresfield Station
L37	R3A Wetlands Pl Link
L38	Wallsend Park to Dangerfield Dr
L39	National Park Links
L40	Mayfield West to Hamilton
L41	Hunter Stadium (R4/R5) to Waratah Park

Scenic/Recreational Routes

S1	Throsby Foreshore to Merewether Baths
S2	Stockton Foreshore – Breakwall to Port Stephens
S3	District Park Circuit
S4	Waratah Park Circuit
S5	Warabrook Wetlands Tracks
S6	Lambton Park Circuit
S7	Maryland Wetlands and Local Tracks
S8	Federal Park Track Wallsend
S9	Hunter Wetlands National Park
S10	Throsby Creek Paths – Carrington/Wickham
S11	Adamstown Park/Myers Park Circuit
S12	King Edward Park

Regional Routes

R1 - Adamstown Heights to Fern Bay

This route currently forms part of the NSW Coastline Cycleway. It commences at the Lake Macquarie LGA boundary on the Fernleigh Track, travelling off road to Adamstown. From near Victoria St Adamstown it travels on road via mostly quiet local streets to the ferry terminal at the Newcastle foreshore. A ferry trip is required to Stockton, then the route travels off road to the boundary with Port Stephens LGA. The off road section from Punt St to Chester St was completed in 2010 and the section from Chester St to Stockton Bridge is to be completed 2011. An alternative to off road route is on road on Fullerton St from Stockton ferry terminal to the Port Stephens LGA boundary. The route is marked in its entirety. Future works involve upgrading of crossings and resurfacing of sections.

Attractors and links:

- Regional link from Lake Macquarie to Newcastle City Centre, part of NSW Coastline Cycleway, scenic route.

Actions:

- Investigate link from R1 (Fernleigh Track at Kotara) to Park Ave traffic signals along eastern side of Northcott Dr.
- Investigate link from R1 (Fernleigh Track) at Dibbs St on northern side of Park Ave to R4 at Kullaiba Rd.
- Rehabilitate Teralba Rd and install traffic calming on Teralba Rd with bicycle bypass (as part of MAPP).
- Upgrade crossings at Glebe Rd/Teralba Rd, Brunker Rd/Melville Rd and Gordon Ave/Dumaresq St.
- Rehabilitate Dumaresq St (Beaumont St to Chatham St) (as part of MAPP).
- Following completion of rehabilitation works, road allocation to be reviewed for Parkway Ave to Chatham St (narrowed traffic lanes and marked bike lanes).

- Investigate Union St for treatment for separated bike paths and subsequent change of route from Corlette St to Union St.
- Construction of shared pathway (approximately 3.3km) from Chester St to Stockton Bridge to be completed 2011/12.
- Road widening required on western side of Fullerton St (programmed for completion in 2012/13).

In the long term, consideration will be given to renomination of the Coastline Cycleway route, to incorporate the section of coast from Merewether Beach to the ferry terminal on the foreshore. This would be subject to the outcome of current investigations of the Bathers Way route (from Nobbys to Merewether) to determine how best to accommodate bike riders.

R2 - Newcastle to Maitland

This almost exclusively on road route travels along major roads from R1 (Adamstown Heights to Fern Bay) at Workshop Way/Honeysuckle Dr, via Hannell St, Industrial Dr, Pacific Hwy, New England Hwy and Anderson Dr from the Newcastle foreshore/City Centre/Honeysuckle areas to the Maitland LGA boundary. It is suitable for experienced cyclists. The majority of roads that form this route are the responsibility of the RMS. Council will liaise with the RMS to effect improvements.

There are many difficult and hazardous locations along this route that require improvements. Key locations include eastbound near Hexham Bridge where a deviation onto Old Maitland Road would allow riders to avoid a very congested section with poor/no provision for cyclists, and parts of Anderson Dr where improvements would also serve local cyclists. Other sections require consideration of marking.

Attractors and links:

- Newcastle City Centre, Honeysuckle, Industrial Dr employment zone.

Actions:

- Lobby the RMS for construction of off road bypass of roundabout at Elizabeth St and Hannell St and other improvements to the route.
- Investigate connection from Industrial Dr to Tourle St (south) through vacant road reserve.
- Investigate bypasses of conflict points Anderson Dr.
- Investigate extension of off road path from intersection of Old Maitland Rd for approximately 500m south to connect to shoulder lane.

R3 - Kotara to Sandgate

This route would travel via the existing and proposed H23 corridor, connecting to the regional route R2 (Newcastle to Maitland) at Sandgate. To the south it would connect to Lookout Rd – Charlestown Rd and then to the constructed H23 Inner City Bypass (West Charlestown Bypass) from Kotara to Bennetts Green in Lake Macquarie.

The Shortland to Sandgate section of the bypass is currently under construction by the RMS. The 1.8km extension will pass underneath Sandgate Rd at Shortland, bridge over Deepbridge Creek and the main northern railway line, run past the western side of Sandgate cemetery and join the Pacific Hwy at Sandgate. An alternative route section, R3A, is proposed to follow Sandgate Rd and Wallsend Rd from the end of H23 to Maitland Rd (Pacific Hwy).

A preferred route for the Rankin Park to Jesmond section of the bypass has been determined and included in Council's planning instruments. It is anticipated that future sections of the Inner City Bypass from Lookout Road to Newcastle Road will include good facilities for cyclists and local connections when they are built.

Attractors and links:

- John Hunter Hospital, Blackbutt Reserve, University of Newcastle.

Actions:

- Investigate issues on Wallsend Rd (limited road widths).
- Lobby the RMS for high standard of provision for bikes in planning for H23.

R4 - Kotara to Tighes Hill TAFE

This route largely comprises the former north - south cycleway. It is off road on a former colliery railway from Kirkdale Dr in Lake Macquarie to St James Rd New Lambton near Adamstown railway level crossing. It mostly uses off road or relatively quiet on road routes. Off road sections are complete but on road sections require marking.

Attractors and links:

- Schools, Westfield Kotara, Kotara Homemaker Centre, International Sports Centre, Showground, Tighes Hill TAFE.

Actions:

- Difficult crossing at St James Rd/Mackie Ave requires upgrade.
- Investigate link from R1 (Adamstown Heights to Fern Bay) through St Pius X High School.
- Negotiate with TAFE to define route through campus; devise solutions to potential safety issues.

R5 - Newcastle City Centre to Glendale

The section of this route from the Showground at Broadmeadow to the City Centre is currently under investigation by Council to determine the preferred east-west route and treatments (clearways, protected paths etc.). From Jackson St Broadmeadow, the route is mainly off road or via quiet local streets to Jesmond and Wallsend, then south along the former tramway to Glendale (completed 2011/12). Most sections have been completed, though some marking is required.

Attractors and links:

- Connections to R4 (Kotara to Tighes Hill TAFE), Newcastle City Centre, Broadmeadow sports and entertainment precinct, Lambton Park, Stockland Jesmond, Glendale TAFE.

Actions:

- Incorporate findings of Inner City Bike Lanes Investigation project into updated work program.
- Address conflicts between users of shared path and residents accessing garages Kemp St Wallsend.
- Investigate crossing of Nelson St at Kemp St.
- Investigate changing route between Low St and west of Nelson St.
- Investigate upgrading of path between Dan Rees St and Cowper St.
- Prepare plans and costings for at-grade car park on Council land at corner of Bousfield St and Ganney Rd.

R6 – Newcastle City Centre to Birmingham Gardens via University

This route has been devised by members of the University of Newcastle BUG and Council officers and associated works are currently being implemented. The route is partly on road through the City Centre and part on existing footways, before joining the shared pathway on the Throsby foreshore and crossing Hannell St to continue off road to Maitland Rd at Hubbard St. The route is then primarily on road to Waratah (to Queen St), off road through Council and University land, through the University and primarily on road to Birmingham Gardens.

A comprehensive audit of the route has been undertaken and all proposed works listed in the Works Program at Appendix 4. The route comprises on road and off road sections, and in some cases, nominates use of existing footways which are to be signposted as shared paths.

A suite of signage has been developed for use on this route and subject to satisfactory evaluation, will provide the template for signage throughout the LGA.

The Newcastle City Traffic Committee has approved changes to travel lane widths for a section of this route, in order to provide a buffer zone from parked cars. The modification has been implemented on a trial basis.

Attractors and links:

- Civic Station, Newcastle City Centre, Honeysuckle, Throsby foreshore, Islington Park, Tighes Hill TAFE, Waratah Station, University of Newcastle.

Actions:

- Difficult crossing of Hannell St from Throsby foreshore – RMS to install mid-block traffic control signals 2012.
- Investigate potential route through TAFE as per R4, including amelioration of potential safety issues.
- Continue to investigate and liaise with ARTC regarding off road path under Maud St rail bridge.
- Confirm preferred works relating to route through Birmingham Gardens, off road shared path and bridge over storm water channel.
- Evaluate trial.

R7 – Fernleigh Tunnel to Newcastle City Centre

This route connects the Fernleigh Track at Faul St Adamstown Heights to the City Centre and commences with an off road section from Fernleigh Track at the southern end of the tunnel, then on road on Faul St and Fernleigh Loop to City Rd. The route continues alongside City Rd on a proposed off road path to Scenic Dr, then on road Scenic Dr, Yule Rd and Morgan St. At Railway St, an off road shared path is proposed to be constructed to the intersection at Union St, then cross at the traffic lights at Union St. The feasibility of separated cycle lanes on Union St is proposed to be investigated. The route would connect to R5 (Newcastle City Centre to Glendale), the eastern end of which is currently under review.

Route 7A continues east on Scenic Dr. Shoulder widening and reconstruction of parts of Scenic Dr, with marking of bike lanes, are scheduled to be undertaken in 2011-13, as per the Works Program. It would continue from Scenic Dr along Frederick St to John Pde, then Watkins St to Patrick St, then the start of separated lanes (proposed) at Union St, as per R7.

Attractors and links:

- Connection to R1 (Adamstown Heights to Fern Bay), local connections to beaches, The Junction Primary School, The Junction shopping centre, City Centre.

Actions:

- Investigate feasibility of separated bike lanes (protected lanes) on Union St.

R8 - Birmingham Gardens to Tarro via Hexham Swamp

This route would start at Wilkinson Ave from the intersection of R5 (Newcastle City Centre to Glendale) and R6 (Newcastle City Centre – University - Birmingham Gardens) with a new off road path across the public reserve to Sandgate Rd, then on road to the Chichester Pipeline, which it would follow from Shortland across Hexham Swamp to Tarro where it would connect to R2 (Newcastle to Maitland) route. It would provide a safe alternative to the Pacific Hwy corridor and connect to various other routes at its eastern end. None of this route is currently built. Because of the long off road sections to be built and possible environmental and engineering issues this is likely to be a long term project. Council has not undertaken environmental investigations to date. Part of the area has recently been gazetted for inclusion in the Hunter Wetlands National Park.

Attractors and links:

- Connections to R5 (Newcastle City Centre to Glendale), R6 (Newcastle City Centre to Birmingham Gardens), Shortland shops, connection to R2 (Newcastle to Maitland), Hunter Wetlands National Park.

Actions:

- Liaise with NPWS regarding inclusion of the route in the Plan of Management for the Hunter Wetlands National Park.
- Monitor for opportunities to incorporate construction of the path in conjunction with development.

R9 - Minmi to Hexham

This off road route would follow a former coal railway across Hexham Swamp. None of this route is currently built. Because of the long off road sections to be built and potential environmental, land ownership and engineering issues this is likely to be a long term project. There may be opportunities though, to incorporate construction of parts of the path as works in kind associated with future development of Minmi and its surrounds.

Attractors and links:

- Minmi township, connection to R11 (Beresfield to Minmi), Hunter Wetlands National Park.

Actions:

- Liaise with NPWS regarding inclusion of nominated bike paths in the Plan of Management for the Hunter Wetlands National Park.
- Monitor for opportunities to incorporate construction of the path in conjunction with development.

R10 - Wallsend to Minmi

This route would be largely an on road route from near Wallsend Hospital (intersection of Longworth Ave, Cameron St, Cowper St and Minmi Rd) to the township of Minmi, providing connections to the residential development off Minmi Rd and links to other routes connecting to the University, Glendale, etc. The regional route is on road, however much of its length will be paralleled by off road paths forming the local bicycle network (e.g. L2, L33). Minmi Rd is a high speed road in places and busy, at least in peak times, and would be challenging for less experienced riders.

Attractors and links:

- Wallsend Hospital, Minmi, connections to R5 (Newcastle City Centre to Glendale) and R11 (Beresfield to Hexham).

Actions:

- Investigate shoulder widening of some sections.
- Identify and construct works (additional off road sections) in conjunction with adjacent development.

R11 - Minmi to Beresfield

This on road route would travel via Woodford St, Lenaghans Dr, F3 and Weakleys Dr from the Lake Macquarie LGA boundary to the Maitland LGA boundary. It includes long sections where traffic speeds are high and is more suited to experienced riders. The northern part of the route is marked but the southern part requires marking. The RMS has responsibility for part of the route.

Attractors and links:

- Links Lake Macquarie, Newcastle and Maitland LGAs, Minmi township, Black Hill industrial area.

Actions:

- Investigate connection from northern end of Lenaghans Dr to F3 northbound.

- Lobby RMS for bypasses of the roundabout at John Renshaw Dr.

R12 – Newcastle Link Rd to City Centre
This route is primarily on road Main Road 82, which comprises the Newcastle Link Rd from the F3 Freeway, Thomas St, Newcastle Rd, Griffiths Rd and Donald St.

Proposed upgrades have been identified by the RMS under the MR82 F3 Freeway to Newcastle Route Development Study. Refer to http://www.rta.nsw.gov.au/roadprojects/projects/the_hunter_region/f3_newcastle/index.html for further details.

R13 – R2 (Industrial Dr at Tourle St) to Port Stephens
This route is primarily on road from the Tourle St intersection with Industrial Dr (R2 Newcastle to Maitland) on Tourle St, Cormorant Rd, Teal St, pedestrian footway on Stockton Bridge and Nelson Bay Rd. Short off road sections are proposed to be constructed to connect the service roads on approaches to the bridge to the pedestrian stairway, and wheel ramps constructed on the stairs. Some sections have been marked but a review of symbols and signage and some widening will be required.

Volumes of traffic are expected to increase on Cormorant Rd and Tourle St, which are important strategic corridors linking Newcastle and Port Stephens. Works on Cormorant Rd have been programmed for 2011 to improve safety, including resurfacing and construction of wider shoulders for the section between the wind turbine and Egret St. In the long term, Cormorant Rd and Tourle St are to be duplicated.

Attractors and links:
- Connections to R1 (Adamstown Heights to Fern Bay), R2 (Newcastle to Maitland), Kooragang Island, Stockton.

Actions:
- The pedestrian footway on the bridge is narrow, but presents a safer path for bike riders than on road. RMS approval required for use of footway by bike riders. Monitor for conflicts with pedestrians.
- RMS to carry out upgrade of Cormorant Rd in the short term and in the longer term, duplicate Cormorant Rd and Tourle St.

Local Routes

L1 - Lenaghans Drive to Maryland
This is proposed to be a primarily off road connection from R11 (Minmi to Beresfield) to R10 (Wallsend to Minmi) at Minmi Rd Maryland. The western part would follow a former coal railway and Hunter Water pipeline, with the on road section to follow Balarang St and Maryland Dr to Minmi Rd. Some sections have been marked but review is required. The on road sections through Maryland are suitable for most riders. Parts of this route are programmed for construction in the short term in conjunction with development in the vicinity of Fletcher.

Attractors and Links:
- Minmi township, Maryland, Bill Elliot Oval, links to L2 (Maryland to Wallsend), L7 (Maryland Dr to Churnwood Dr Link), S7 (Maryland Wetland and Local Tracks).

Actions:
- Monitor for opportunities to construct sections in conjunction with development in Blue Gum Hills.

L2 - Maryland to Wallsend
This route commences with an existing shared path from Maryland Dr east to the intersection at Creek Rd, then is proposed as primarily on road on Macquarie St, Devon St and Bousfield St to link with R5 (Newcastle City Centre to Glendale) near Ganney Rd. The route passes

close to the Wallsend commercial centre. The on road section from Creek Rd to R5 is not marked.

Attractors and links:

- Connection to R5 (Newcastle City Centre to Glendale), R10 (Wallsend to Minmi) and L1 (Lenaghans Dr to Maryland), Callaghan High (Wallsend Campus), Wallsend pool, Wallsend commercial area, library, etc.

L3 - Wallsend to Jesmond

This on road route would use quieter streets to connect R5 (Newcastle City Centre to Glendale) at Cowper St near the commercial centre to residential areas and to R3 (Kotara to Sandgate). There are steep sections, it is circuitous and the crossing of Cowper St requires assessment. It is not marked.

Attractors and links:

- Wallsend commercial area, connections to R3 (Kotara to Sandgate) and R5 (Newcastle City Centre to Glendale).

Actions:

- Inconvenient access from R5 (Newcastle City Centre to Glendale) requires assessment to ascertain opportunities for improvement.
- Connection to R3 to be considered with the extension of H23 (Rankin Park to Jesmond). Council to liaise with RMS to facilitate connections.

L4 - Wallsend to New Lambton

This primarily on road route would connect R5 (Newcastle City Centre to Glendale) from Wallsend commercial centre to R3 (Kotara to Sandgate) at Lookout Rd just south of John Hunter Hospital. Walford St/Cardiff Rd has some traffic calming devices but the road is narrow and does not allow marking of separate bike lanes. The streets followed carry medium levels of traffic, and McCaffrey Dr has steep sections. The route would best suit more experienced, confident riders.

Attractors and links:

- Connects R3 (Kotara to Sandgate) and R5 (Newcastle City Centre to Glendale).

L5 - Wallsend to Cardiff Rd (Lake Macquarie)

This would provide an on road connection from L4 (Wallsend to New Lambton Heights) via Cardiff Rd to the Lake Macquarie LGA boundary. It is not marked.

Attractors and links:

- Connects to L4 (Wallsend to New Lambton Heights), links to Lake Macquarie.

L6 - Wallsend to Jubilee Rd (Lake Macquarie)

This route provides a largely on road connection from R5 (Newcastle City Centre to Glendale) via Jubilee Rd to the Lake Macquarie LGA boundary. There is moderate traffic, some narrow or difficult sections, and the crossing of Lake Rd at a refuge would be challenging for less experienced riders.

Attractors and links:

- Links to R5 (Newcastle City Centre to Glendale), Elermore Vale Public School.

L7 - Maryland Dr to Churnwood Dr

This route provides a short, local, on/off road connection along Maryland Dr past the Glendore Public School and Glendore Community Centre. It links L1 (Lenaghans Dr to Maryland) with R10 (Wallsend to Minmi) at Minmi Rd and would cater for local users.

Attractors and links:

- Glendore Public School, Glendore Community Centre, connects R10 (Wallsend to Minmi) and L1 (Lenaghans Dr to Maryland).

Actions:

- Off road sections are less than the minimum desired width and require marking as shared paths. Use is to be monitored to determine if upgrades are required in the long term.

L8 - University to John Hunter Hospital

This largely off road route from Sandgate Rd at Vale St would connect through the University and H23 Inner City Bypass to R5 (Newcastle City Centre to Glendale) at Jesmond Park, then via bushland routes to John Hunter Hospital and Lookout Rd New Lambton Heights. There are some very steep sections, and parts travel through privately owned land. Large sections of the route already exist off road. Lookout Rd has no provision for cyclists and does not appear satisfactory for on road use. A safe connection is required between the northern hospital access and future H23 near McCaffrey Dr. A widened footway exists along most of the western side of Lookout Rd from McCaffrey Dr past the hospital complex as far as Russell Rd, serving northbound cyclists. Southbound cyclists can access this path via traffic signal pedestrian crossings at Croudace St or at the hospital northern or southern entrances. Additional widening of the narrow section would require removal of a number of trees from the footway. Investigation required to fully assess constraints.

Attractors and links:

- University, connections to Callaghan High School (Jesmond Campus), Jesmond Primary School, Jesmond Park, John Hunter Hospital.

Actions:

- Audit connections of L8 to Callaghan High School (Jesmond Campus) and Jesmond Primary School to ensure adequacy of paths, symbols and signage.
- Investigate feasibility of off road section from Newcastle Rd through Jesmond Park to meet R5 (Newcastle City Centre to Glendale).
- Obtain approvals for path through hospital grounds.
- Investigate widening of 200m narrow off road sections between hospital entrances.

L9 - Lambton to H23 Kotara

This almost exclusively on road route would connect R5 (Newcastle City Centre to Glendale) at Howe St/Tyrone Rd New Lambton to R3 (Kotara to Sandgate) at Carnley Ave/Charlestown Rd. There are some steep sections and moderate traffic, including congestion in places.

Attractors and links:

- Lambton commercial area, Lambton Park, Lambton pool, New Lambton commercial area, Regent Park, Blackbutt shops and Blackbutt Reserve.

L10 - Callaghan to Georgetown (University to R6)

This would be a primarily on road route using local streets and providing both local access and a link from the University to the Tighes Hill TAFE via R6 (Newcastle City Centre to Birmingham Gardens) at its eastern end. Some streets have narrow sections and moderate traffic volumes and there is hilly terrain over the North Lambton hill. The route is not marked.

Attractors and links:

- University, Tighes Hill TAFE

Actions:

- Road widening Acacia Ave between Greystone St and Alnwick Rd is required.
- Signals have been constructed to replace the refuge for access across Lambton Rd, however further work at this intersection is required to improve conditions for bike riders. Possible alternatives are to widen the off road paths on signal approaches and to provide refuges in the medians to allow continuity for cyclists on Christo Rd.
- Investigate options from Christo Rd to Clyde St for safe crossing of Georgetown Rd and to bypass roundabout.

- Negotiate route through TAFE.

L11 - Waratah to Lambton
This would provide a short, mainly on road route from L10 (Callaghan to Georgetown) at Acacia Ave via the Lambton business centre to link with R5 (Newcastle City Centre to Glendale) at Lambton Park. Lambton Park also contains a major pool complex and a branch library and the perimeter path (S6) is programmed for completion in 2012. There are some steep sections between Acacia Ave and Elder St, but traffic is generally low to moderate. The route is not marked.

Attractors and links:
- Lambton shops, Lambton Park, library and pool, links to R5 (Newcastle City Centre to Glendale), S6 (Lambton Park Circuit).

Actions:
- Signals at Newcastle Rd/Morehead St require upgrading to incorporate cycle lanterns.

L12 - University to Warabrook (Pacific Hwy)
This short off road connector would link the University with Warabrook Station, the scenic route around the Warabrook wetlands (S5) and Pacific Hwy. Its primary focus would be on local and University users.

Attractors and links:
- Warabrook Station, University, Warabrook wetlands.

Actions:
- Construct shared paths.

L13 - Waratah to University via Warabrook
This route will be primarily on road using mostly local streets with low volumes. Maitland Rd and Maud St carry high volume traffic, are congested and narrow, and it is proposed to construct new shared paths around the Maitland Rd/Maud St signals. The route is not marked.

Attractors and links:
- Link to R6 (Newcastle City Centre to Birmingham Gardens via University), Waratah Station, Waratah Park, link to L12 (University to Warabrook)

Actions:
- Signals at Maud St require modification to incorporate cycle lanterns.

L14 - Waratah Station to Mayfield East
This route would provide local connections from Waratah using quiet to moderate traffic streets, with traffic signal access across Maitland Rd. It is not marked.

Attractors and links:
- Link to R6, Waratah Station, Waratah Park, Mayfield shops, Mayfield East Public School.

L15 - Mayfield to Mayfield North
This route is on road and provides local connections using generally quiet streets. It is not marked.

Attractors and links:
- Tighes Hill TAFE, Mayfield East Public School, Dangar Park, links to R2 (Newcastle to Maitland) and R6 (Newcastle City Centre to Birmingham Gardens).

L16 - Broadmeadow Racecourse to Georgetown
This proposed route is primarily on road, using mostly quiet streets. It is proposed on road on Darling St, Melville Rd, Coorumbung Rd, Graham Rd, Young Rd, Market St, then off road

crossing of the Broadmeadow railway bridge. It continues on road on Moira St, Curley Rd, Broadmeadow Rd, Chatham Rd, Young St, then off road through Waratah Park.

Attractors and links:

- Broadmeadow Racecourse, Merewether High School, Broadmeadow Station, Broadmeadow sports and entertainment precinct, links to L10 (Callaghan to Georgetown), L18 (Adamstown to Hamilton South), R1 (Adamstown Heights to Fern Bay, R4 (Kotara to Tighes Hill TAFE) and R5 (Newcastle City Centre to Glendale).

L17 - Hamilton

This is a short connector route, linking R1 (Adamstown Heights to Fern Bay), R5 (Newcastle City Centre to Glendale), R12 (Newcastle Link Rd to City Centre). It would cross busy Tudor St at the Steel St traffic signals and use mostly quieter streets. It is not marked.

Attractors and links:

- Links R1 (Adamstown Heights to Fern Bay) and R5 (Newcastle City Centre to Glendale), Hamilton Public School, Hamilton business centre, Gregson Park.

L18 - Adamstown to Broadmeadow Racecourse

This route would connect to R1 (Adamstown Heights to Fern Bay) at both ends, running on Victoria St from near Adamstown Station to Adamstown business centre, covering residential areas of Adamstown, part of Merewether (including near the golf course) and then to Hamilton South. It would use quieter streets but has a difficult crossing of Glebe Rd and a steep but short grade in Victoria St. It is not marked.

Attractors and links:

- Adamstown Station, Adamstown business centre, library, Broadmeadow racecourse.

Actions:

- Investigate options to improve crossing of Glebe Rd, and feasibility of alternate route to June St, shared path to traffic signals and shared path to Hassall St.

L19 – Hamilton South (Gordon Avenue) to R5)

This would be a short on road link along Gordon Ave from R1 (Adamstown Heights to Fern Bay) at Dumaresq St to R5 (Newcastle City Centre to Glendale) near Selma St. Gordon Ave is wide at the southern end but more congested north of the Tudor St signals. The route is not marked.

Attractors and links:

- Connects R1 (Adamstown Heights to Fern Bay) to R5 (Newcastle City Centre to Glendale).

L20 - Stockton

This route is proposed as an on road connector from the ferry terminal to R1 (Adamstown Heights to Fern Bay) at the northern end of Fullerton St, on Mitchell St, Barrie Cr, Griffith Ave, Eames Ave and Meredith St. It is to be considered in conjunction with work on the Coastal Revitalisation project, in which an off road path from S2 to connect to R1 near Fullerton St north has been mooted. Limited width in parts and coastal erosion hazards will constrain potential routes. It is expected that proposed cycleways will be confirmed in development of the South Stockton Public Domain Plan (under the Coastal Revitalisation project), by mid 2012, following which concept plans and an implementation program will be developed.

Attractors and links:

- Ferry terminal, Dalby Oval, Stockton pool, beach, links to R1 (Adamstown Heights to Fern Bay) and S2 (Stockton Foreshore – Breakwall to Port Stephens).

Actions:

- Confirm preferred routes in Stockton as part of the Coastal Revitalisation project, having regard to known hazards and constraints.

- Monitor for opportunities for supplementation of cycleways in Stockton with the Fort Wallace Stockton Rifle Range redevelopment.

L21 - New Lambton to Fernleigh Track and Teralba Rd (R1)
This would be a short link from New Lambton at L9 (Lambton to H23 Kotara) at Regent St, to regional routes R4 (Kotara to Tighes Hill TAFE) and R1 (Adamstown Heights to Fern Bay). It would use St James Rd, which is relatively busy and has some congestion at the Bridges Rd traffic signals, at New Lambton South Public School and at Adamstown railway crossing. There is an off road section between Kings Rd and Park Ave on the north side of St James Rd. St James Rd has some markings, which require review. Although this road is congested, it has been observed to be well patronised by bike riders and reallocation of road space to favour cycling is to be investigated.

Attractors and links:
- Adamstown Station, New Lambton South Public School, links to L9 (Lambton to H23 Kotara), R1 (Adamstown Heights to Fern Bay) and R4 (Kotara to Tighes Hill TAFE).

Actions:
- Investigate reallocation of road space on St James Rd, in conjunction with the RMS.
- Investigate feasibility of provision of an off road path from Mackie Ave through Adamstown railway gates to Teralba Rd (to link to R1, for northbound cyclists).

L22 – Tighes Hill TAFE to Hamilton
This route is on road on Chinchen, Fern and Beaumont Sts to Donald St. There is some parking congestion in Fern St and Beaumont St. A difficulty is the east bound right turn from Fern St into Beaumont St at the eastern end of the route.

Attractors and links:
- Tighes Hill TAFE, connections to R4 (Kotara to Tighes Hill TAFE), R5 (Newcastle City Centre to Glendale), R6 (Newcastle City Centre to Birmingham Gardens) and R12 (Newcastle Link Rd to City Centre).

L23 - John Hunter Hospital to R4 (Kotara to Tighes Hill TAFE) at Turton Rd
This on road route would connect from L8 (University to John Hunter Hospital) at John Hunter Hospital to R4 (Kotara to Tighes Hill TAFE). The first section is off road to Carrington Pde, then on road on Carrington Pde, Brett St, Curzon Rd, Regent St, Victoria St and Burke St, before crossing Bridges Rd at existing signals and on road on Sketchley Pde to Mackie Ave. Streets are mostly low volume but there are steep and narrow sections, and congestion in the New Lambton business centre. The route is not marked.

Attractors and links:
- Link to L8 (University to John Hunter Hospital), John Hunter Hospital, New Lambton shops, link to R4 (Kotara to Tighes Hill TAFE).

Actions:
- Consider ramp adjacent to stairs on Carrington Pde to provide a more direct route.

L24 - Merewether to The Junction
This on road route would connect from Curry St via Mitchell St, to Union St/R7A (Fernleigh Tunnel to Newcastle City Centre).

Attractors and links:
- Mitchell Park, The Junction shops, connection to R7A (Fernleigh Tunnel to Newcastle City Centre).

L25 - Bar Beach
This short local connection would be on road on Parkway Ave, linking regional route R1 (Adamstown Heights to Fern Bay) and the adjoining suburbs of The Junction, Merewether and Cooks Hill to the coast, to R7 (Fernleigh Tunnel to Newcastle City Centre) and Bar

Beach. The roundabout at Darby St has linemarking for cyclists, however there is the option to use off road paths to bypass the roundabout. The route is not marked.

Attractors and links:

- Bar Beach, links to R1 (Adamstown Heights to Fern Bay), R7 (Fernleigh Tunnel to Newcastle City Centre) and S1 (Honeysuckle to Merewether Baths).

L26 - Maryland Dr to Minmi Rd

This would be a local on road connection using Boundary Rd and Warkworth St. A refuge exists at Minmi Rd that would assist in crossing and also connect to the residential area on the south side. The route is not marked.

Attractors and links:

- Shops, Maryland Public School, link to L1 (Lenaghans Dr to Maryland) and R10 (Wallsend to Minmi) and S7 (Maryland Wetland and Local Tracks).

L27 - Merewether to Newcastle West/Throsby Creek Shared Pathway

This local on road route would connect from R7 (Fernleigh Tunnel to Newcastle City Centre) via Llewellyn St, Railway St and National Park St to R5 (Newcastle City Centre to Glendale) and through to Throsby Creek shared path, via the Stewart Ave level crossing. It would cross Glebe Rd at existing traffic signals, but there are several roundabouts along it, and in places concrete road joints are a potential issue for cyclists. It will be necessary to allow southbound cyclists to cross through the road closure in National Park St. Traffic volumes are generally low to moderate. The route is not marked.

Attractors and links:

- Newcastle High School, National Park, City West, Marketown, link to R7 (Fernleigh Tunnel to Newcastle City Centre).

Actions:

- Investigate and implement changes to parking on Beresford St.
- Upgrade path on Hannell St to shared path and construct link between Hannell St and old Lee Wharf Rd.

L28 - Waratah

This local on road route would connect L10 (Callaghan to Georgetown) at Christo Rd to R6 (Newcastle City Centre – University – Birmingham Gardens) using quieter local streets - Harriet St, High St and Bridge St. It passes close to several schools and the Mater Hospital (which can be accessed via traffic signals at Platt St). The route is not marked.

Attractors and links:

- Waratah Public School, proximate to Mater Hospital and Waratah Shopping Village, connects L10 (Callaghan to Georgetown) to R6 (Newcastle City Centre – University – Birmingham Gardens).

L29 - Carrington Loop to Hamilton

This local route would be on road on Cowper St, Young St and Elizabeth St connecting the suburb to other routes such as regional routes R2 (Newcastle to Maitland) and R6 (Newcastle City Centre – University – Birmingham Gardens) and continuing to Hamilton via Branch St, Albert St, Ivy St and Fern St. Elizabeth St carries higher volumes and heavy vehicles at its western end – an off road alternative, part of S10 (Throsby Creek Paths) is to be provided. Major roundabouts at Hannell St provide a high level of difficulty if connecting to the on road route. It is not marked.

Attractors and links:

- Carrington Public School, Carrington shops, links to R2 (Newcastle to Maitland), R6 (Newcastle City Centre – University – Birmingham Gardens), S10 (Throsby Creek Paths) and Hamilton shopping precinct.

Actions:

- Upgrade off road bypasses of Hannell St roundabout.

L30 – Merewether Beach Link (R7 to Dixon Park)

This proposed on road local route on Berner St, Ocean St and John Pde would connect Dixon Park to R7 (Fernleigh Tunnel to Newcastle City Centre) and Merewether Beach. The route is not marked.

Attractors and links:

- Dixon Park, Merewether Beach, link to R7 (Fernleigh Tunnel to Newcastle City Centre) and S1 (Honeysuckle to Merewether Baths).

L31 - John Hunter Hospital to Wallsend

This route would provide a connection from John Hunter Hospital using internal roads, paths and carparks then via future off road tracks through bushland to join Elermore Pde and local route L3 (Wallsend to Jesmond). It would cross future regional route R3 (Kotara - John Hunter Hospital – Sandgate) which would provide links to the University and to Lake Macquarie. This is a ridgeline link, which requires extensive construction of off road paths. This is a long term proposal, with significant further investigation required to establish its feasibility and construction standard, having regard to impacts on bushland, compounded by impacts (bushland fragmentation) associated with H23 construction (timeframe currently unknown). The on road section is not marked.

Attractors and links:

- John Hunter Hospital, links to R3 (Kotara – John Hunter Hospital – Sandgate) and L3 (Wallsend to Jesmond).

Actions:

- Investigate route and construction standard.

L32 - Braye Park Links

This route provides alternatives to L10 (Callaghan to Georgetown) using paths through Braye Park. It leaves L10 (Callaghan to Georgetown) at Acacia Ave and continues along Allowah St into the park, then via off road routes to connect to Clarence St, rejoining L10 at Christo Rd. Alternatively, riders can go off road to High St, then L28 (Waratah Local) to L10. The on road sections require marking.

Attractors and links:

- Braye Park, links to L10 (Callaghan to Georgetown), L28 (Waratah Local).

L33 - Minmi to Maryland Dr West

Off road shared path adjacent to Minmi Rd north side from intersection at Woodford St to Maryland Dr west. Some sections of path have been completed. The path is to be extended and connected in line with future development.

L34 - Foreshore (S1) to King Edward Park (S1)

This proposed connection provides a direct, rather than scenic, connection from the foreshore to King Edward Park. The proposal arises from consideration of the recommendations of the *Newcastle City Centre Renewal Transport Management and Accessibility Plan* (AECOM, 2010). A shared path is proposed on the east side of Watt St from the foreshore to Scott St, then protected two-way lanes to Church St, then shared path to S1. The proposal is subject to detailed investigation and costing. It is indicated as a study area on the route maps due to the extent of investigations required.

L35 - Wharf Rd (Ferry Terminal) to Watt St

Proposed on road Wharf Rd from Ferry Wharf, then on Shortland Esp to Watt St. Details are to be determined under the Coastal Revitalisation project.

L36 - R11 to Beresfield Station
This proposed route is on road John Renshaw Dr to the north bound slip lane of the New England Hwy, crosses the New England Hwy then continues on road Allendale St, Anderson Dr and Lawson Ave to Beresfield Station.

Attractors and links:
- Industrial areas John Renshaw Dr, Beresfield Station, Beresfield shops, link to R2 (Newcastle to Maitland).

Actions:
- Investigate off road link to Allendale St.
- Investigate off road path from western side of New England Hwy to northern side of John Renshaw Dr western bound slip lane.

L37 - R3A Wetlands Pl Link
This proposed link from R3A to the Astra St golf practice range will be dependent on timing and nature of redevelopment of the site.

L38 – Wallsend Park to Dangerfield Dr
Proposed off road shared pathway from Walford St/Thomas St traffic signals. Route follows Ironbark Creek through Upper Reserve, Croudace Road Reserve, crossing Croudace Rd west of Sherwood St, Jarvis Close Reserve, crossing Cardiff Rd adjacent to Ironbark Creek, Elermore Vale Park, crossing Grandview Rd west of Croudace Rd and Croudace Rd south of Grandview Rd to connect to Dangerfield Dr.

Attractors and links:
- John Hunter Hospital, Wallsend Upper Reserve, Elermore Vale shops.

Actions:
- Investigate route feasibility.

L39 – National Park Links
Proposed east-west and north-south off road paths through National Park as indicated in the draft *National Park Plan of Management*.

Attractors and links:
- Links will provide local access to Marketown, and connect to the R1 investigation route. The links will also provide off road alternatives to R1 on Union St and Parkway Ave.

Actions
- Exhibit draft *National Park Plan of Management* and undertake detailed design if approved.

L40 – Mayfield West to Hamilton
This route is on road on George St (from Ingall St) to Industrial Dr, off road to William St, then on road William, St, Lewis St and Mary St to Maitland Rd. The route is off road on the northern side of Maitland Rd from Mary St to Beaumont St, then on road on Beaumont St.

Attractors and links:
- Hamilton shopping precinct, connection to R6 (Newcastle City Centre – University – Birmingham Gardens) at Lewis St.

L41 - Hunter Stadium (R4/R5) to Waratah Park
Route is off road eastern side of Turton Rd signals from R4/R5 at the Hunter Stadium on existing shared path to Griffiths Rd traffic signals, then proposed off road Turton Rd on eastern side to lane north of City of Newcastle works depot, then on road on lane, Asher St and Parkview St to Waratah Park.

Attractors and links:

- Hunter Stadium, key connection from Mayfield to regional routes R4/R5 and stadium, Waratah Park.

Actions:

- Remove bollards, undertake concept design of shared pathway.

Scenic Routes

S1 – Throsby Foreshore to Merewether Baths

This route could be considered Newcastle's primary scenic route, encompassing the Throsby foreshore and the popular Bathers Way Coastal Walk, which extends from Nobbys headland to Merewether Beach. Bathers Way is not signposted as a shared path and therefore can only legally be used by bike riders under 12 and supervising adults. Notwithstanding this, the route is very popular and has the potential to be an even greater tourist attraction. The *Newcastle Coastal Revitalisation Strategy Master Plan Report*, endorsed by Council in October 2010, proposes to modify Bathers Way to accommodate pedestrians and cyclists along the route. This has been identified as a high priority by the community and Council. Officers are currently undertaking a detailed public domain planning process of the route, which will also have regard for potential changes to traffic conditions at Shortland Esplanade (for example, conversion to one-way traffic), also proposed in the *Newcastle Coastal Revitalisation Master Plan Report*.

Some sections of the route are quite constrained. The project will cover analysis of all constraints and opportunities to determine how best to meet project objectives, which include creation of an iconic walk and cycleway from Nobbys to Merewether to meet current and future demand; prioritisation of pedestrians and cyclists over vehicles at traffic conflict areas; and consideration of linkages from the Bathers Way to surrounding public domain. It is anticipated that a draft public domain plan for the Bathers Way will be placed on public exhibition in 2012. The proposals listed in the Works Program at Appendix 4 are potential inclusions only. Final concepts will be determined though the Bathers Way project.

S2 - Stockton Foreshore (Break Wall to Port Stephens)

Much of this route has been completed, or is to be completed in the short term. An off road network around the Stockton foreshore and an on road extension to Fern Bay (in Port Stephens) were identified as medium priority projects in the *Newcastle Recreation Plan 2006 – 2016*. Stage 1 of the Stockton cycleway involved construction of a shared path from near Punt Rd to Chester St, with 50% of funds contributed by the Department of Planning under the NSW Coastline Cycleway program. Stage 2 of the works involves construction of a shared pathway approximately 3.3km long from Chester St to Stockton Bridge. These works have commenced and are expected to be completed by the end of 2011/12.

S3 – District Park Circuit

A shared fitness track/cycleway is proposed around District Park. Detailed planning of the route would be undertaken as part of the ongoing development of the precinct by the Land and Property Management Authority and Hunter Region Sporting Venues Authority. A concept masterplan has been prepared for the Broadmeadow precinct by the Government Architect's Office, which was engaged by the Hunter Development Corporation on behalf of the Hunter Region Sporting Venues Authority and the then Department of Lands. This is likely to be a long term project, in which Council's role is limited to advocacy. A connection exists from District Park to the regional routes R4 (Kotara to Tighes Hill TAFE), R5 (Newcastle City Centre to Glendale) and local route L16 (Broadmeadow to Georgetown).

S4 - Waratah Park

A shared fitness track/cycleway is proposed around Waratah Park. This is a long term option. Detailed planning of this route would be undertaken as part of the ongoing development of the park. A connection exists from Waratah Park to the regional route R6 (Newcastle City Centre - University - Birmingham Gardens).

S5 - Warabrook Wetlands
A series of paths exist around the Warabrook wetlands. An extension of the current path from the end of Eucalyptus Cct to the existing carpark and path to Warabrook Station and the University is proposed (approximately 310m) as a medium term project. A possible extension could occur in the longer term from the existing path at the southern end of Decora Cres.

S6 - Lambton Park Circuit
This route would provide a perimeter shared path around Lambton Park. This project was identified as a priority site in the *Newcastle Recreation Plan 2006 – 2016*. The perimeter section from Howe St, Durham Rd and Karoola Rd to the Bowling Club was completed in 2010. The section from the Bowling Club on Karoola Rd to Morehead St is to be completed in the short term.

S7 - Maryland Wetland and Local Tracks
This is a series of off road paths around the perimeter of Maryland adjacent to Hexham Swamp, and through the centre of the suburb using reserves where possible and some local streets. Some paths exist around the outside of the Callan Ave, Gundaroo Cct and Balarang St sector of the developed area and connecting as far as Hampton Way. A section from Minmi Rd to Ajax Ave, on Maryland Dr east, was completed in 2010. The proposed path from Ajax Ave through Bill Elliot Oval and the reserve south of Rosamond St to connect to Kensington Gr will require further investigation to determine optimal path alignment, having regard to impacts on bushland and other environmental constraints. Route modification may be required.

S8 – Federal Park Track Wallsend
A shared path is proposed through parks from the Wallsend campus of Callaghan High School, past Wallsend pool, through Federal Park and connecting to Wallsend business centre. It requires approximately 820m of new paths. This project was identified in the *Newcastle Recreation Plan*. It is a long term project, to be considered in conjunction with future development of 1A Minmi Rd.

S9 – Hunter Wetlands National Park (Kooragang Rehabilitation Project)
This is a series of existing and proposed future paths accessed from Maitland Rd (Pacific Hwy) just east of Shamrock St traffic signals, constructed as part of the Kooragang Rehabilitation Project. This is a long term project. The area has recently been gazetted as part of the Hunter Wetlands National Park. Council is to ensure ongoing communication with the National Parks and Wildlife Service to ensure incorporation of the paths in the Plan of Management.

S10 - Throsby Creek (S10)
This route would utilise mainly existing paths along Throsby Creek on the eastern and western sides from the Cowper St bridge to Elizabeth St. A section of new shared path is required from the western side of the Cowper St bridge across to eastern foreshore to connect to the existing paths at Kennedy Cove. Further investigation is required to determine the route of the new path and whether existing service roads are suitable. This path connects to and uses part of the regional route R6 (Newcastle City Centre - University - Birmingham Gardens) and L29 (Carrington Loop).

S11 – Adamstown Park/Myers Park Circuit
A shared fitness track/cycleway is proposed around Adamstown Park. Detailed planning of this route would be undertaken as part of the ongoing development of the park. The work is a longer term option only.

S12 - King Edward Park
The park has several existing roads and paths. Further investigation is required to determine how best to accommodate bike riders through the park, and to connect to S1 (Throsby Foreshore to Merewether Baths). Council is currently investigating options under the Coast Revitalisation project, in conjunction with the work on the Bathers Way.

Appendix 3 – Route Maps

JOINS SHEET 4

JOINS SHEET 5

JOINS SHEET 2

Proposed R5/R12 Study Area

Proposed R1/R7A/R1 Study Area

Proposed L34 Study Area

Railway Overpass

Narrows Bridge

Hunter River

Stockton Beach

Newcastle Beach

Bar Beach

Merewether Beach

Nobbys

Islington Park

Wickham Park

Wallarah Park

Adamstown Park

Civic Park

Mitchell Park

Empire Park

Dixon Park

Nesca Park

National Park

King Edward Park

The Foreshore

THE HILL

NEWCASTLE

FORT SCRATCHLEY

James Fletcher Hospital

Lingard Private Hospital

NEWCASTLE CYCLING STRATEGY AND ACTION PLAN

ROUTE MAPS

MAP 1

ALIGNMENT OF PROPOSED ROUTES ARE SUBJECT TO DETAILED INVESTIGATION AND DESIGN

LEGEND

- On Road - Existing route
- On Road - Proposed route
- Off Road - Existing route
- Off Road - Proposed route
- Inner city bike lane study area
- Major parks
- Community land
- Wetlands - National Park
- University
- LGA Boundary
- Rail line
- Stockton Ferry
- Train Station
- Hospital
- TAFE Campus
- School
- Shopping Centre
- Local shopping area

Notes:

R# denotes Regional route

L# denotes Local route

S# denotes Scenic or Recreational route

Newcastle City Council
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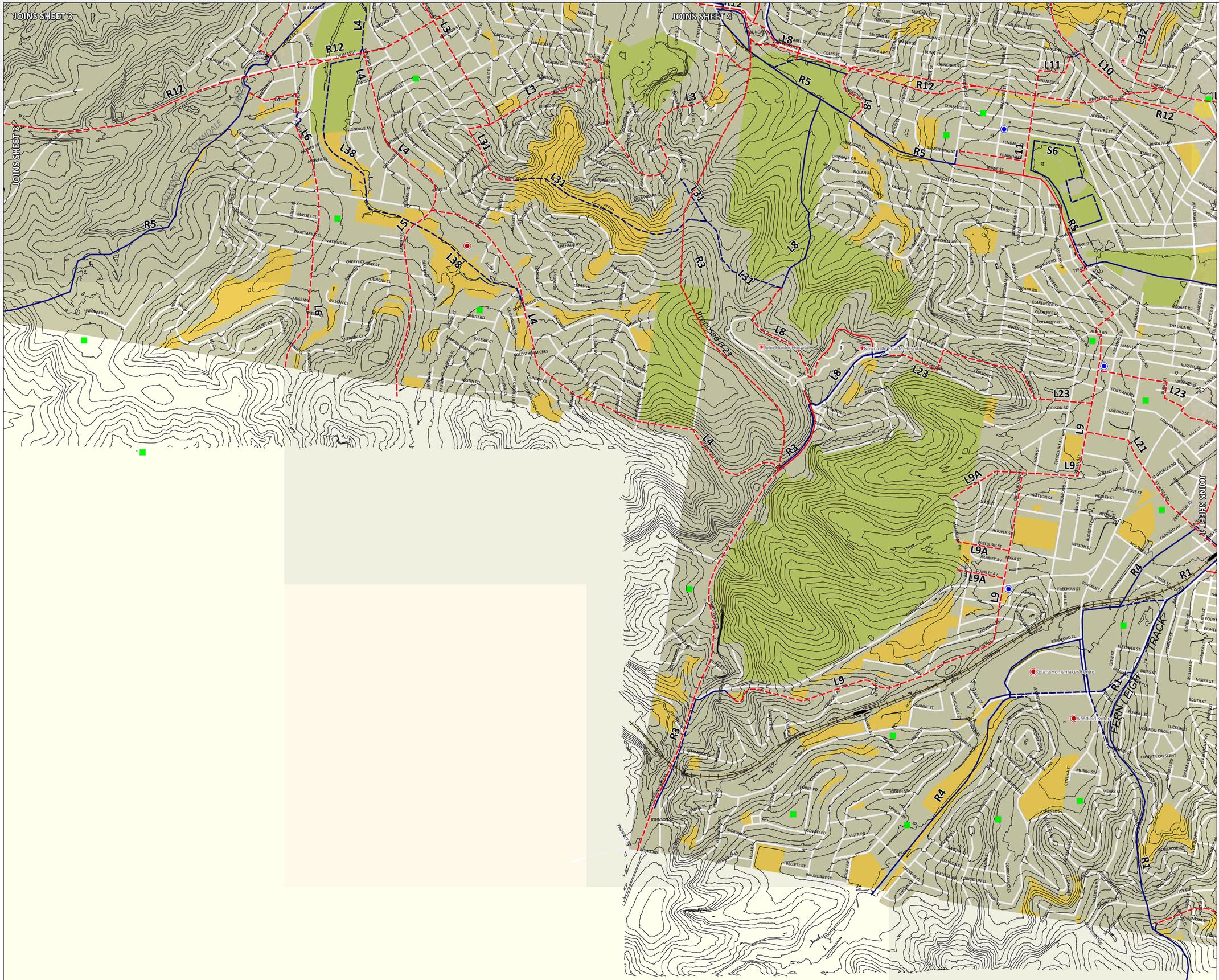

The City of Newcastle

NEWCASTLE CYCLING STRATEGY AND ACTION PLAN

ROUTE MAPS

MAP 2

ALIGNMENT OF PROPOSED ROUTES ARE SUBJECT TO DETAILED INVESTIGATION AND DESIGN

LEGEND

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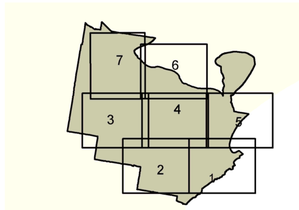

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JOINS SHEET 7

JOINS SHEET 4

JOINS SHEET 2

JOINS SHEET 2

The City of Newcastle

NEWCASTLE CYCLING STRATEGY AND ACTION PLAN

ROUTE MAPS

MAP 3

ALIGNMENT OF PROPOSED ROUTES ARE SUBJECT TO DETAILED INVESTIGATION AND DESIGN

LEGEND

- On Road - Existing route
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NORTH

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NEWCASTLE CYCLING STRATEGY AND ACTION PLAN

ROUTE MAPS

MAP 4

ALIGNMENT OF PROPOSED ROUTES ARE SUBJECT TO DETAILED INVESTIGATION AND DESIGN

LEGEND

- On Road - Existing route
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NORTH

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NEWCASTLE CYCLING STRATEGY AND ACTION PLAN

ROUTE MAPS

MAP 5

ALIGNMENT OF PROPOSED ROUTES ARE SUBJECT TO DETAILED INVESTIGATION AND DESIGN

LEGEND

- On Road - Existing route
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metres

JOINS SHEET 4

JOINS SHEET 1

R13

R1/S2

R2

R6/S1

R6/L22

S1

S10

L14

L15

L40

L29

L20

UNNAMED ST

CORMORANT RD

RAVEN ST

SANDPIPER CL

GREENLEAF RD

HERON RD

EGRET ST

Corroba Park

Dangar Park

Narrow Bridge

Stockton Beach

NEWCASTLE CYCLING STRATEGY AND ACTION PLAN

ROUTE MAPS

MAP 6

ALIGNMENT OF PROPOSED ROUTES ARE SUBJECT TO DETAILED INVESTIGATION AND DESIGN

LEGEND

- On Road - Existing route
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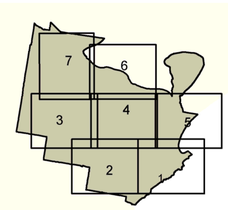

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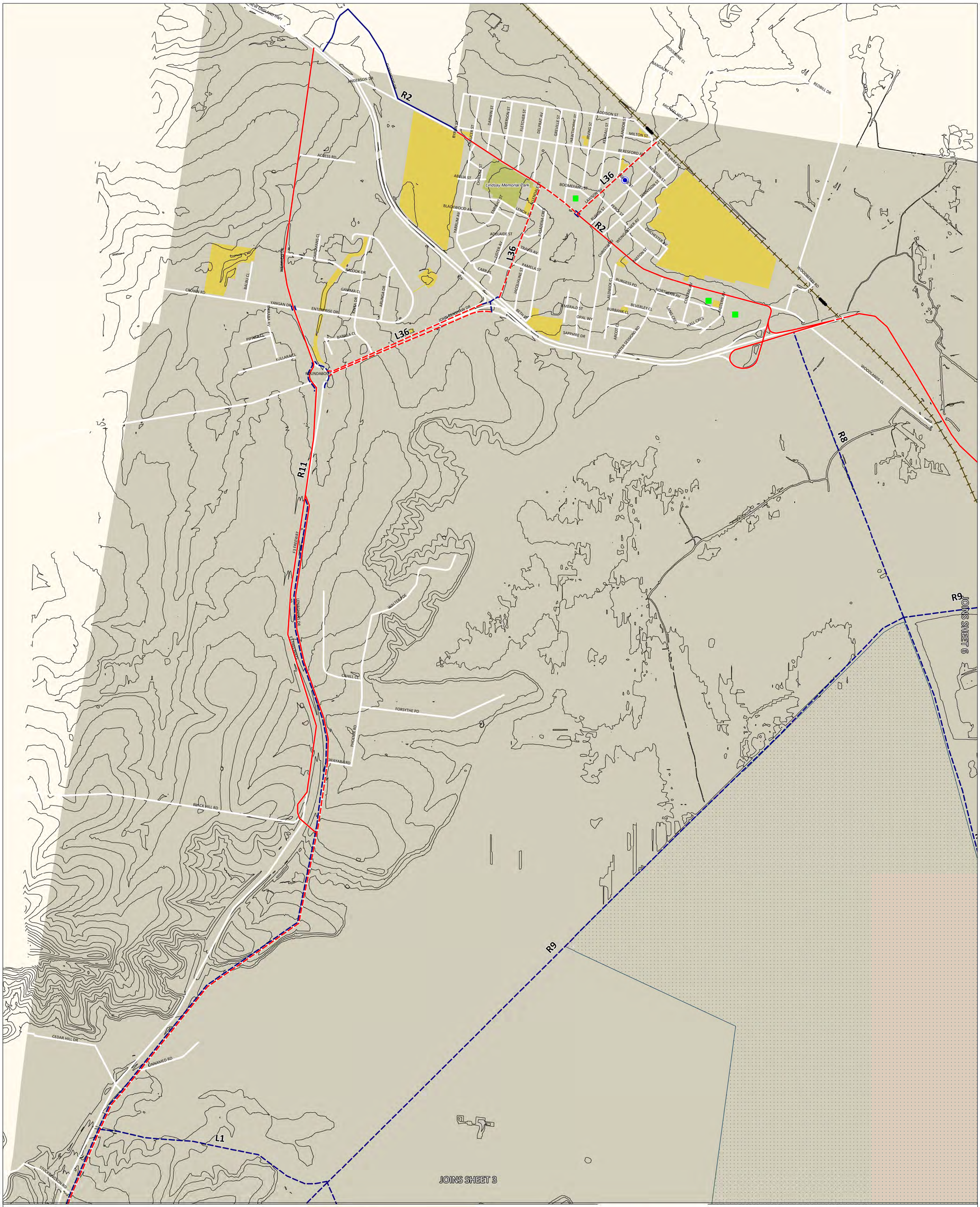
JOINS SHEET 7
JOINS SHEET 4



LEGEND

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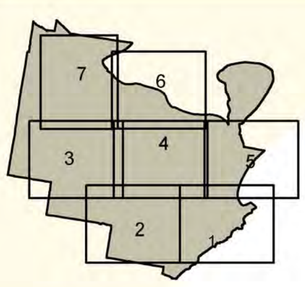

NORTH

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The City of Newcastle

NEWCASTLE CYCLING STRATEGY AND ACTION PLAN

ROUTE MAPS

MAP 7

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The City of Newcastle

CYCLING STRATEGY AND ACTION PLAN

NEWCASTLE LGA

MAP 8

ALIGNMENT OF PROPOSED ROUTES ARE SUBJECT TO DETAILED INVESTIGATION AND DESIGN

LEGEND

- On Road - Existing route
- On Road - Proposed route
- Off Road - Existing route
- Off Road - Proposed route
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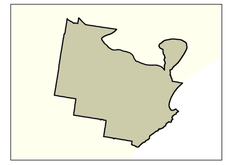

Newcastle City Council

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Appendix 4 – Works Program

NEWCASTLE CYCLING STRATEGY AND ACTION PLAN - WORKS PROGRAM

	DESCRIPTION	STATUS/NOTES	WORKS/ACTIONS	TIME	COST	$
	Note: Works Program to be read in conjunction with maps, which indicate existing and proposed sections.					
Key:	**Time:** Short: <5 years Medium: 5-10 years Long: > 10 Years	**Cost:** Low: < $50,000 Medium: $50,000 - $100,000 High: > $100,000				
	Regional Routes					
R1	**Adamstown Heights to Fern Bay**					
	Off road on Fernleigh Track and Park Ave (footway) from Lake Macquarie LGA boundary to Victoria St Adamstown.	Essentially complete.	Various minor improvements. Widen ramp at Park Ave/Victoria St for holding rail.	Short	Low	2,000
		Investigate link from R1 (Fernleigh Track at Kotara) to Park Ave traffic signals along eastern side of Northcott Dr.		Short		
		Investigate link from R1 (Fernleigh Track) at Dibbs St on northern side of Park Ave to R4 at Kullaiba Rd.		Short		
	On road Victoria St, Teralba Rd, Melville Rd, Gosford Rd, Pokolbin St, Chatham Rd, Dumaresq St.	Essentially complete as part of Coastline Cycleway. Upgrade of three difficult crossings required (Glebe Rd at Teralba Rd, Brunker Rd at Melville Rd and Gordon Ave at Dumaresq St. Concept plans to be developed 2011/12. Funding application 2012/13 for 2013/14 construction. Part grant funded.	Upgrade crossings at: Glebe Rd/Teralba Rd, Brunker Rd/Melville Rd, Gordon Ave/Dumaresq St.	Short	High	500,000
		Stage 1 of works programmed for 2010/11. Completion of works in 2013.	Installation of traffic calming on Teralba Rd with bicycle bypass. Rehabilitation of Teralba Rd.	Short	High	
			Dumaresq St (Beaumont St to Chatham St) rehabilitation. Install "No Stopping" signs south side of Dumaresq St adjacent to racecourse.			MAPP
	On road Parkway Ave, Corlette St, Laman St, Auckland St, Hunter St.	Some sections with higher traffic and extensive parking, roundabouts. Installation of traffic lights at Union St/Parkway Ave was completed in 2010. Review of route for consideration of peak dedicated bike lanes and other options initiated (Inner City Bike Lanes Investigation). Rehabilitation of Dumaresq St under MAPP. Following completion of rehabilitation works in 2012, road allocation to be reviewed for Parkway Ave to Chatham St (narrowed traffic lanes and marked bike lanes).	Consider options in Hunter St, and Auckland St to Merewether St.	Short		
			Consider future route through Union St (including separated bike paths) instead of Corlette St.	Medium		
		Note proposed study area for future investigation of separated lanes includes Corlette St (refer to R7).				
	Merewether St (proposed partly off road), on road Wharf Rd to Newcastle Ferry (Queens Wharf).	Narrow sections, higher traffic, extensive parking. Modifications due to installation of roundabout at Workshop Way completed 2011.				
		Construct kerb ramp on Hunter St west of Merewether St to facilitate transition to Merewether St shared footway.		Short	Low	
	Ferry ride to Stockton.					
	Off road to Port Stephens LGA boundary.	Existing path from Stockton Ferry terminal to Punt St. Punt St to Chester St completed in 2010. Cost shared between Department of Planning and Council.				
		Construction of shared pathway (approximately 3.3km) from Chester St to Stockton Bridge funded and to be completed 2011/12. Existing off road path from bridge to Port Stephens LGA boundary.	Construct shared path (3.3km).	Short	High	

	DESCRIPTION	STATUS/NOTES	WORKS/ACTIONS	TIME	COST	$
		Alternative to off road route is on road on Fullerton St from Stockton Ferry terminal to Port Stephens LGA boundary. Road widening required on western side of Fullerton St. Road widening programmed for completion in 2012/13.	Road widening.	Short	Medium	MAPP
R2	**Newcastle to Maitland**					
	On road Workshop Way, Honeysuckle Dr, Hannell St to intersection at Elizabeth St.	Some sections high traffic, roundabouts, extensive parking. Refer to R6 for issues and works for Workshop Way and Honeysuckle Dr (to Cottage Creek).				
		Honeysuckle Dr from Cottage Creek to intersection with Hannell St.	Narrow travel lane widths and mark bicycle lanes.			
		Conflict at double lane roundabout at intersection of Elizabeth St and Hannell St.	Construct off road sections to bypass roundabout.			RMS
	On road Hannell St from intersection at Elizabeth St to intersection at William St (Tighes Hill).		Improve markings.			RMS
	Off road from intersection at William St (Tighes Hill) to intersection at George St.	Cyclist refuge at intersection of Industrial Dr and William St. Commencement of off road section.	Upgrade existing shared path (400m) to provide two-way connection between Mayfield East and Tighes Hill.			RMS
	On road from intersection at George St to intersection at Woodstock St.		Improve markings.			RMS
		No separate bike lanes at intersection Industrial Dr and Ingall St.	Mark on road bike lanes through traffic signals.			RMS
		Intersection of Industrial Dr and Vine St - improve safety and connectivity. Proposed off road section on south side from Avon St to Bull St.	Construct off road sections south side of Industrial Dr from Avon St to Bull St.			RMS
	Proposed off road from west of Woodstock St to west of Tourle St, southern side.		Construct off road section.			RMS
		Improve access to Tourle St at intersection through implementation of hook turn from southern off road section.	Hook turn from southern off road section for cyclists to access Tourle St.			RMS
		In conjunction with above off road works, investigate connection to Tourle St (south) through vacant road reserve.	Investigate connection to Tourle St (south).			
	On road west of Tourle St to Maitland Rd.	Discontinuation of bike lane east of Werribi St.	Revise on road bike lane markings for continuity through the intersection.			RMS
	On road Pacific Hwy (Maitland Rd) to Ironbark Ck.	No safe provision for cyclists near intersection of Pacific Hwy and Wallsend Rd due to commencement of left turn lane to Wallsend Rd	Construct off road path (approximately 430m) south side Pacific Hwy to traffic signals at Wallsend Rd and beyond to commencement of shoulder lane, to allow safe transition through intersection.			RMS
		High traffic, high speeds. Route is largely unmarked.	Investigate shoulder widening and mark on road route.			RMS
	On road Pacific Hwy (Maitland Rd) from Ironbark Creek to Hexham Bridge.	High traffic, high speed. Route is largely unmarked. Hexham Bridge/New England Hwy area high hazard.	Mark on road route and bike lanes through intersections.			RMS
		No shoulder/bike lane through Shamrock St intersection. Investigate off road path from 130m east of Shamrock St to west of Shamrock St.				
	Off road transition from Pacific Hwy to New England Hwy.	Short section of off road path existing. No shoulder lanes through Hexham Bridge area for cyclists travelling north. Extend off road path back 300m to Hexham Station and north for approximately 725m to connect to shoulder lane on New England Hwy.				
	On road New England Hwy to Anderson Dr via Tarro interchange.	High traffic, high speeds, narrow sections and narrow bridge at railway overpass Tarro.	Investigate widening of bike lanes and bridge, or alternative route.	High		RMS

	DESCRIPTION	STATUS/NOTES	WORKS/ACTIONS	TIME	COST	$
	Proposed on road Anderson Dr, to Byron St.	Some narrow and/or unmarked sections Anderson Dr. High traffic volumes and trucks. Option to use service road from Western Ave to Lawson Ave. Existing off road bypass of Lawson Ave traffic signals and roundabout at Glenwood Dr.	Investigate marking bike lanes (approximately 3.7km), bypasses of conflict points, constructing missing sections.		Medium	
		Investigate connection from south side Anderson Dr near Byron St to Glenwood Dr roundabout.				
	Off road Glenwood Dr to roundabout at Weakleys Dr.					
	Off road Weakleys Dr to interchange on New England Hwy.					
R2	**Maitland to Newcastle**					
	Off road Weakleys Dr to Glenwood Dr.					
	Off road Glenwood Dr to Anderson Dr, off road Anderson Dr to intersection at Byron St.					
	On road Anderson Dr from Byron St to Tarro interchange (New England Hwy).	Some narrow and/or unmarked sections on Anderson Dr.				
	On road New England Hwy.					
	On road marked lane (green paint) north of Hexham Bridge to southern signals.					
	Off road from signals to intersection at Old Maitland Rd.	Investigate extension of off road path from intersection at Old Maitland Rd for approximately 500m south to connect to shoulder lane.	Investigate extension of off road path.			
		Alternative route (south bound from intersection at Old Maitland Rd) - continue on road on Old Maitland Rd to southern intersection of Old Maitland Rd with Pacific Hwy. Route proposed as a safer alternative until completion of off road link.	Mark on road route.	Short	Low	
	On road Pacific Hwy to Industrial Dr.	High traffic volumes, high speeds. No shoulder at turn onto Industrial Dr.	Investigate shoulder widening and mark on road route.	Medium	High	
	On road Industrial Dr to intersection with Steel River Blvd, on road to east of Werribi St.	Shoulder lane ends east of Werribi St to allow traffic turning left on Tourle St. On road route is paralleled by a section of off road path from Steel River Blvd to Werribi St.				
	Off road Industrial Dr from Tourle St to west of Woodstock St.	Existing path from east of Tourle St to west of Woodstock St however no connectivity to network. Proposed works involve extension of off road path to bypass intersection at Tourle St.	Construct new off road section from Tourle St intersection to west of Tourle St; connect to existing section.			RMS
	On road Industrial Dr from Woodstock St to Elizabeth St.	Conflict at double lane roundabout at intersection Elizabeth St and Hannell St.	Intersection of Elizabeth St and Hannell St - proposed off road sections to bypass roundabout.	Medium		RMS
	On road Hannell St from Elizabeth St to intersection at Cowper St.					
	On road Hannell St from intersection at Cowper St to intersection at Honeysuckle Dr.					
	On road Honeysuckle Dr, Workshop Way.	Refer to R6 for issues and works for Workshop Way.				
R3	**Kotara - John Hunter Hospital - Sandgate**					
	Proposed on road (mostly) from Lake Macquarie LGA boundary via H23 Inner City Bypass, Charlestown Rd, Lookout Rd.	High traffic, high speed, steep sections, narrow/no bike lanes, high hazard.	Investigate marking bike lanes, bypasses of conflict points.	Medium		RMS
	Lookout Rd on road to McCaffrey Dr traffic signals, off road to John Hunter Hospital via main entry.	High traffic, speed, steep sections, narrow/no bike lanes, high hazard.	Negotiate route through John Hunter Hospital.	Short	Low	
	Proposed route via future H23 from John Hunter Hospital to Jesmond roundabout at Newcastle Rd.	Future works as part of H23 construction. Important connection to R5, L8.	Council to advocate to RMS for provision in future H23 connection to Jesmond.	Medium	High	RMS
		Consider using L8, L31 as interim routes (L8 priority).		Medium		

	DESCRIPTION	STATUS/NOTES	WORKS/ACTIONS	TIME	COST	$
	On road H23 to Pacific Hwy (and R2) at Sandgate.	Part complete, part future works with H23 (Shortland to Sandgate) extension.	Construct H23 connection to Sandgate.	Short	High	RMS
R3A	Section of Sandgate Rd from H23 to north of Astra St - off road. On road on Wallsend Rd from north of Astra St to Maitland Rd (Pacific Hwy).	Sandgate Rd section to be completed 2011/12.	Construct off road path.	Short	High	
			Investigate issues on Wallsend Rd.	Medium		
R3	**Sandgate - John Hunter Hospital - Kotara**					
	Proposed off road path at intersection of Pacific Hwy and H23 (Shortland to Sandgate).	Access for cyclists from Pacific Hwy (southbound) to H23 westbound through intersection.				RMS
	Proposed on road on H23 from Pacific Hwy to Sandgate Road.					RMS
	On road on existing H23.	On road route paralleled in part by existing off road path L8 to Newcastle Rd service road.				
	Route to follow proposed H23 extension (Rankin Park to Jesmond) to John Hunter Hospital.	Rankin Park to Jesmond section of H23 is not funded. Completed sections of H23 have 1.5m shoulder lanes for cyclists. Advocate to RMS for provision of high standard facilities for cyclists in extension of H23.	Construct route H23 from Rankin Park to Jesmond.			RMS
	Access through John Hunter Hospital; off road on west side of Lookout Rd to signals at McCaffrey Dr.					
	On road Lookout Rd, Charlestown Rd to intersection at Carnley Ave; mainly off road adjacent to Charlestown Rd to roundabout at intersection with Park Ave; on road H23 to Lake Macquarie LGA boundary.	High traffic, high speed, narrow/no bike lanes in parts. Off road section at Carnley Ave to facilitate access through intersection and connect to off road path east side of Charlestown Rd.	Advocate to RMS for improvements.			RMS
R4	**Kotara to Tighes Hill TAFE**					
	Off road along former colliery railway from Lake Macquarie LGA boundary to Park Ave, cross at signals.	Existing path.				
	Off road along storm water channel to Bradford Cl, off road south side Bradford Cl on shared pathway and across Northcott Dr at traffic signals, along shared pathway to railway.	Existing paths, including on south side Bradford Cl connecting to path at Northcott Dr.				
	Off road through playing fields, under railway viaduct, along former colliery railway to St James Rd.	Existing path. Consider status/tenure. Difficult crossing at St James Rd.	Upgrade crossing at St James Rd/Mackie Ave.	Short	Medium	
		Consider link to Fernleigh Track (R1) through St Pius X High School. Preliminary investigations only to date.	Investigate St Pius X High School link.	Long		
		Consider off road link from R4 at St James Rd to R1 at Teralba Rd.	Investigate link to R1 at Teralba Rd for access to City Centre.	Short		
	On road along Mackie Ave, Jellicoe St.	Existing route, narrow road, concrete centre. Narrow bridge but low traffic volumes. Very poor pavement.	Symbols, signs - 900m.	Short	Low	2,500
			Pavement rehabilitation.	Medium	High	MAPP
			Upgrade/widen bridge crossing (on or off road options).	Long	High	100,000
	Off road adjacent to storm water channel to Lambton Rd. Cross at traffic signals.	Existing path.				

	DESCRIPTION	STATUS/NOTES	WORKS/ACTIONS	TIME	COST	$
	Off road along existing shared path east side Turton Rd to ISC/R5 (near intersection of Turton Rd and Monash Rd), then along R5 off road path through ISC adjacent to Styx Creek to Jackson St.	Existing path. Confirm tenure. Shared path is in very poor condition due to adjacent tree roots. Rehabilitation required. Vegetation along edge of path protrudes into path reducing usable area. New bridge across Styx Creek to connect to S3 constructed 2011 (provides better connectivity to Broadmeadow Station).				
	On road Jackson St, cross Griffiths Rd at traffic signals, to Bates St.	Short off road path (10m) from traffic signals at Griffith Rd to Bates St.	Symbols, signs - 320m.	Short	Low	7,000
		Investigate off road path on eastern side of Jackson St.				
	On road Bates St, Newcastle St, Clyde St to TAFE.	Mark route to TAFE.	Symbols, signs - 1.0km.	Short	Low	2,600
		Potential route through TAFE campus to shared path Maitland Rd and connection to R6. Negotiate route through TAFE. Option is on road via Chinchen and Hubbard St.	Negotiate for route through TAFE, mark and signpost approximately 550m.	Medium	Low	1,500
R5	**Newcastle City Centre to Glendale via ISC**					
	On road King St from Auckland St (R1) to Parry St to Hamilton.	Existing on road route, high traffic, high parking, high difficulty. Review of route for consideration of separated bike lanes and other options initiated (Inner City Bike Lanes Investigation).		Short		
	On road Donald St, Griffiths Rd, then R4 Jackson St via Showground traffic signals and short off road path.	Existing on road route, high traffic, parts high parking, parts high difficulty. Review of route for consideration of separated bike lanes and other options initiated (Inner City Bike Lanes Investigation). As per R4, investigate off road path Jackson St.	Symbols, signs as required.	Short	Low	5,000
	Off road R4 at Showground, through ISC to Turton Rd.	Existing path. Some issues with private car use. Tenure issues. Traffic signals required at Turton Rd crossing as part of stadium upgrade.				
	Off road via New Lambton Park to Tyrone Rd.	Existing path.				
	On road Tyrone Rd, Lambton Rd, Howe St to Croudace St.	High traffic in parts. Links to S6 at Lambton Park. Off road section along western boundary of Lambton Park adjacent to Howe St completed 2010.	Review marking.			
		New off road section from Tyrone Rd to Durham Rd proposed in conjunction with major road upgrades at Lambton Rd, Durham Rd, Hobart Rd and Howe St.	Off-road section from Tyrone Rd to new traffic signals at Durham Rd.	Short	High	
		Investigate alternative route through Lambton Park and Pearson St in conjunction with road upgrade.	Investigate alternative route.	Long		
	Off road via former tramway and Jesmond Park to Illoura St.	Connections to Stockland Jesmond, University, John Hunter Hospital. Safe crossing of future H23 construction required.	Advocate to RMS for facilities for cyclists at future crossing.	Short		RMS
	Proposed off road Illoura St, Newcastle Rd footways, then signals at Blue Gum Rd.	Alternative existing path through Jesmond Park to signals at Newcastle Rd near Jesmond Hotel.	120m shared path Illoura St, Newcastle Rd to signals.	Medium	High	150,000
	Off road from Newcastle Rd to Mordue Pde, on road Mordue Pde.	Shared path at rear of Jesmond Hotel completed 2010.	Symbols, signs on Mordue Pde - 800m.	Short	Low	2,000
	Off road along former tramways to lane at Wilkinson Ave.	Existing path.				
	Off road behind Wilkinson Ave along former tramway to Kemp St Wallsend.	Existing path. Conflict issues between users of shared path and residents accessing garages.	Address issues associated with private driveways and car parking.			
	On road Kemp St, Dan Rees St.		Symbols, signs as required.	Short	Low	
		Investigate crossing of Nelson St at Kemp St.		Medium		

	DESCRIPTION	STATUS/NOTES	WORKS/ACTIONS	TIME	COST	$
		Investigate changing route between Low St and Cowper St by removing parking lane on northern side of Cowper St and constructing a bi-directional protected cycleway in its place. This would require a major upgrade to the Cowper St/Nelson St intersection. This route would remove the conflicts currently experienced on Dan Rees St/Low St, particularly crossing Nelson St.		Medium	Medium	
	Off road along Cowper St and former tramway to Ganney Rd/F3 Link Road.	Existing path.				
		Construct at-grade car park on Council-owned land at corner of Bousfield St and Ganney Rd.				
	Off road along former tramway to Lake Macquarie LGA boundary near Glendale TAFE.	Off road shared path Wallsend to Glendale to be completed 2011/12.				
R6	**Newcastle City Centre to Birmingham Gardens via University**					
	On road Workshop Way.	Installation of roundabout at intersection of Workshop Way with Merewether St completed 2011 with bicycle symbols centrally located.				
		Workshop Way is narrow. Symbols marked in centre of lanes to indicate shared carriageway.				
	On road Honeysuckle Dr from Workshop Way to pedestrian refuge east of Cottage Creek.	Cycle lanes marked and green paint in conflict areas completed 2011.				
		Bicycle ramp installed in 2011 on southern side Honeysuckle Dr to access pedestrian refuge.				
	Off road along northern side of Honeysuckle Dr to former Lee Wharf Rd.	Existing footpath converted to shared path in 2011. Some obstructions and uneven surface. (This section to be revised in conjunction with future development of Honeysuckle to ensure continuity with existing shared path on harbour foreshore.)				
	Off road along Throsby Creek foreshore to Cowper St bridge.	Existing path. Some conflict issues. No clear desire lanes in area near Cowper St bridge. Additional signage with 10km/h advisory speed installed in 2011 to enable path to be used. Drop offs adjacent to boardwalk at the Fishermans Coop to be fenced to address cycle hazard.	Construct barrier fencing adjacent to boardwalks (programmed for 2012).	Short	Low	
	Off road along Throsby Creek foreshore to intersection at Hannell St.	Signs, centreline marking and symbols installed 2011/12.				
		Extremely difficult crossing of Hannell St at refuge. RMS have programmed the installation of mid block traffic control signals in 2012.	Install mid-block traffic signals.	Short	High	RMS
	Off road from Hannell St, through Islington Park to Maitland Rd at Hubbard St.	Existing path. Signs, centreline marking and bicycle symbols installed 2011/12.				
		Difficult crossing at Lewis St/William St. Design for crossing upgrade complete.	Improvements programmed for 2012.	Short	High	120,000
	On road Hubbard St to Chinchen St.	Trial on road cycle lanes were installed on Hubbard St in 2011 by narrowing the vehicle travel lanes.	Monitor trial to determine success.	Short	Low	
		Missing pedestrian leg on eastern side at traffic signals intersection of Maitland Rd and Hubbard St.	Advocate to RMS for upgrading of signals at Hubbard St/Maitland Rd.	Short		RMS
		Short off road section (approximately 10m) constructed in 2011 on west side of Hubbard St to allow safe crossing of Maitland Rd on pedestrian phase.				
		Alternative route is off road through TAFE, however there may be safety issues at night with this route.	Investigate route through TAFE as per R4.			

NEWCASTLE CYCLING STRATEGY AND ACTION PLAN - WORKS PROGRAM

DESCRIPTION	STATUS/NOTES	WORKS/ACTIONS	TIME	COST	$
On road Chinchen St.	Trial on road cycle lanes were installed on Chinchen St in 2011 by narrowing the vehicle travel lanes.	Monitor trial to determine success.	Short	Low	
On road Scholey St including rail bridge, Gardiner, Upfold Sts and cut through to Braye St.	Narrow rail bridge and approaches on Scholey St. Riders must 'command the lane'. Symbols were marked in the centre of the lanes over the rail bridge and in the bicycle operating space along Gardiner St and Upfold St in 2011/12 to indicate the presence of cyclists. Bridge alterations will be very high cost.				
On road and proposed off road Hanbury St/Platt Sts over railway bridge to traffic signals at Waratah Station (Platt St) and Prince St.	Modify existing median on Hanbury St northwest of Braye St by providing cut throughs and linking paths and ramps on Hanbury St, Braye St and Upfold St.	Modify median (programmed for 2012).	Short	Low	
	Construct shared pathway linking Prince St to Braye St via the Platt St overbridge. The works will remove cyclists off road from the Platt St railway overbridge, crossing the traffic signals at Waratah Station and bypassing the Turton Rd at Platt St roundabout to avoid conflict with motor vehicles. These works will partly complement/complete missing link on the University to City Centre cycle project.	Construct shared path (programmed for 2012).	Short	High	
	Bike lane widened on inside lane over rail bridge to increase space and green paint added at Braye St intersection to improve safety for on road cyclists in 2011/12.	Add green paint on inside lane over rail bridge (programmed for 2012).	Short	Low	
	Upgrade of crossing and link to Platt St west of Station St subject to negotiation with rail authorities. Include ramp to enable on road cyclists to exit Platt St to access signals.	Upgrade signalised crossing at Waratah Station to cater for cyclists (programmed for 2012).	Short	Low	
		Construct ramp (programmed for 2012).	Short	Low	
On road Prince St to Maud St, cross at refuge to Vera St.	Symbols were marked in the bicycle operating space along Prince St and Vera St in 2011/12 to indicate the presence of cyclists.				
	Improved crossing of Maud St required.	Investigate option of pedestrian signal crossing at Maud St with RMS.	Medium	High	
	Alternative option to crossing at Maud St is to investigate off road path under Maud St rail bridge, or a tunnel adjacent to the bridge. Land acquisition and negotiation with rail authorities required. Potential high cost of works.	Continue to negotiate with rail authorities.	Long	High	
On road Vera St to Queen St.	Symbols were marked in the bicycle operating space along Prince St and Vera St in 2011/12 to indicate the presence of cyclists.				
Off road on Council and University land along former railway corridor to Wirra Cr.	Existing shared path.				
On internal University roads to east gate entry road, cross at refuge. Off road through University to H23 and R3/L8 (cross west gate entry road at refuge).	Improve signposting of route to clarify path through internal roads.	Mark and signpost route in consultation with University approximately 1.5km.	Short	Low	5,000
Cross H23 via grade separated shared path.	Existing ramps.				
On road Wilkinson Ave, then to storm water channel/R8/R5 via path beside No. 115 Wilkinson Ave.	Existing marked route extends on road to Tillie St. Requires partial removal and redirection.	Signpost connection beside No. 115; remove marking west of No. 115 on Wilkinson Ave; mark rear lane.	Short	Low	5,000
Future route from Regal Theatre via new off road path through Council car park, then on north side of University Dr, then on west side of Blue Gum Rd to Cameron St, then on road along Cameron St and across storm water channel to R5.	Proposed option, requires bridge over storm water channel. Cameron St is a quiet residential street.	Construct off road shared path 320m long, mark and signpost Cameron St, construct bridge 17m long over storm water channel.	Long	High	270,000

	DESCRIPTION	STATUS/NOTES	WORKS/ACTIONS	TIME	COST	$
		Alternative, high cost option to above is future off road route via former rail corridor from Blue Gum Rd to storm water channel/R5/R8. Land dedicated/owned by NCC; Hunter Water Corporation approval required for new bridge over storm water channel. High cost works, low priority. Works would involve construction of off road shared path approximately 650m including bridge approximately 17m long. Estimated cost $450,000.				
R7	**Fernleigh Tunnel to Newcastle City Centre**					
	From Faul St near the Fernleigh Tunnel, the route is on road on Faul St, Fernleigh Loop to Pacific Hwy/City Rd, and then proposed off road to Scenic Dr.	Future off road path on southern side Pacific Hwy from Scenic Dr to intersection at Fernleigh Loop.	Construct 700m off road shared path or bi-directional protected cycle lanes.			RMS
	On road Scenic Dr, Yule Rd and Morgan St.		Mark and signpost.	Short	Low	
	From Morgan St, cross roundabout to proposed shared path on southern side of Glebe Rd, to the traffic signals at Union St.		Construct bicycle bypass at roundabout (including pedestrian/cycle refuge).	Long	Medium	
			Construct shared path southern side of Glebe Road from Morgan St to Union St.	Long	High	
	Cross Glebe Rd at Union St.	Investigate crossing at Union St. Consider access from Glebe Rd shared path to proposed separated bike path Union St south of Glebe Rd.	Investigate crossing arrangements as part of feasibility assessment of separated bike paths on Union St.	Medium	Medium	
	Proposed separated bike paths along Union St to Hunter St/King St.	High activity area, schools, shopping centre.	Investigate 40km/h speed limit and traffic calming measures through The Junction.	Medium		
			Investigate feasibility of separated bike paths along Union St to Hunter St/King St (study area to be confirmed).	Medium		
R7A	**Scenic Dr at Yule Rd to Newcastle City Centre (via Watkins St)**					
	On road Scenic Dr.	From Yule Rd to Charlotte St, shoulder widening is programmed for 2012-14.	Construct shoulder widening Yule Rd to Charlotte St	Short	Medium	
		Scenic Dr reconstruction (Charlotte St to Frederick St) programmed for 2011-13.	Construct uphill marked bike lane and downhill wide kerbside lane as part of Scenic Dr reconstruction.			
	On road Frederick St to John Pde, on road Watkins St to Patrick St, then Union St.	Proposed marked on road lanes as part of the Merewether Public Domain Masterplan and Coastal Revitalisation project.	Mark on road lane.			
	Proposed separated bike paths along Union St to meet R7.	Investigate separated bike paths as per R7.				
R8	**Birmingham Gardens to Tarro via Hexham Swamp**					
	Proposed off road from R5/R6 at former tramway/Wilkinson Ave via Harold Myers Park to Sandgate Rd.	New off road path through Harold Myers Park.	Construct 300m off road shared path at cost of approximately $120,000.	Long	High	
	Proposed on road Sandgate Rd to Chichester pipeline north of Mawson St.	Existing edge lines mostly marked, parking at shopping centre, heavy vehicles.	Symbols, signs 2km.	Long	Low	5,000
	Proposed off road along reserve for Chichester water supply pipeline from Sandgate Rd to Tarro at New England Hwy, connect to R2.	Long term future works, environmental issues, Hunter Water Corporation approval required. Approximately 9km including bridges over creeks and crossing of New England Hwy. Very high cost. Monitor for long term opportunities with other works.	Investigate project and funding options. If approved construct approximately 9km shared path. Cost approximately $5.5M. Ensure ongoing communication with National Parks and Wildlife Service to incorporate route in Hunter Wetlands National Park Plan of Management.	Long	High	NPWS

NEWCASTLE CYCLING STRATEGY AND ACTION PLAN - WORKS PROGRAM

	DESCRIPTION	STATUS/NOTES	WORKS/ACTIONS	TIME	COST	$
R9	**Minmi to Hexham**					
	Proposed off road on former railway corridor.	Future works. Environmental and land ownership issues. Approximately 8km, includes bridge over Great Northern Railway and Pacific Hwy. Difficult connection to Pacific Hwy southbound. Very high cost (> $6M).	Monitor for opportunities to coordinate with other works and future development in the vicinity of Minmi. Ensure ongoing communication with the National Parks and Wildlife service to incorporate route in Hunter Wetlands National Park Plan of Management.	Long	High	
R10	**Wallsend to Minmi**					
	On road Minmi Rd from Sandgate Rd at R5 to Minmi.	Mostly edge line marked. High peak traffic on Minmi Rd, some higher speed sections.	Symbols and signage.	Short	Low	
		Some sections require widening. Investigate.	Investigate shoulder widening.			
		Route on Minmi Rd is paralleled in parts by off road sections, some of which comprise local routes (e.g. refer to L33).	Identify and construct works (additional off road sections) as development proceeds.			
R11	**Minmi to Beresfield**					
	From Lake Macquarie LGA boundary, route is on road Woodford St, then Lenaghans Dr, to intersection at Blackhill Rd. Northbound cyclists need to turn left on Blackhill Rd to access F3 Freeway.	Mostly edge line marked. High volumes. High speeds. Some narrow sections.	Widen or reseal road shoulders including Weakleys Flat Creek Bridge and mark on road route.	Medium		RMS
		Proposed off road Woodford St and Lenaghans Dr to provide alternative path.				
	On road Blackhill Rd, roundabout, Blackhill Rd.					
	On road F3/Lenaghans Dr to roundabout at John Renshaw Dr.	Northbound cyclists are required to travel on F3 for a considerable distance (approximately 2.75km). Investigate connection from northern end of Lenaghans Dr to F3 northbound/John Renshaw Dr roundabout.		Long		
		No facilities for northbound cyclists through roundabout at John Renshaw Dr. Investigate bypass of roundabout on western side for northbound cyclists.				RMS
	On road Weakleys Dr to Maitland LGA boundary.	Existing off road bypass of roundabout at Yangan Dr/Enterprise Dr.				
R11	**Beresfield to Minmi**					
	From intersection of Weakleys Dr and New England Hwy, on road Weakleys Dr to roundabout at John Renshaw Dr.	Narrow shoulders in parts. Some off road sections eastern side of Weakleys Dr. Off road bypass of roundabout at Enterprise Dr.				
	On road roundabout at John Renshaw Dr, on road F3 Freeway, on road Lenaghans Dr, Woodford St to Lake Macquarie LGA boundary.	Southbound cyclists travel on F3 for a short distance then access Lenaghans Dr from slip lane. Off road bypass required at roundabout John Renshaw Dr.				
R12	**Newcastle Link Road to City Centre**					
	Primarily on road, Newcastle Link Rd, Thomas St, Newcastle Rd, Griffiths Rd.	Upgrade works identified by the RMS under the MR82 F3 Freeway to Newcastle Route Development Study. Refer to http://www.RMS.nsw.gov.au/roadprojects/projects/the_hunter_region/f3_newcastle/index.html.				RMS
R13	**R2 (Industrial Dr at Tourle St) to Port Stephens**					
	On road Tourle St, Cormorant Rd, Teal St to service road on approaches to Stockton Bridge.	Continue proposed off road section at Tourle St intersection (see R2) for approximately 100m west side of Tourle St.	Construct shared path 100m.	Medium	Medium	
		Route is narrow in parts. Some sections will require shoulder widening.	Review symbols and signs.	Short	Low	

	DESCRIPTION	STATUS/NOTES	WORKS/ACTIONS	TIME	COST	$
		Section of off road path required from service road to stairs at Stockton Bridge.	Construct shared path.			
		Construct bicycle wheel ramp on stairs.	Construct bicycle wheel ramp.			
	Cross bridge on pedestrian footway.	Approval required.	Symbols, signs.			
		Construct bicycle wheel ramp on stairs on eastern side of bridge.	Construct bicycle wheel ramp.			
	Off road from bridge to shoulder on Nelson Bay Rd, then on road to Port Stephens LGA boundary.	Construct off road path approximately 120m from stairs to shoulder on Nelson Bay Rd.	Construct shared path approximately 120m.			
R13	**Port Stephens to R2 (Industrial Dr at Tourle St)**					
	From Nelson Bay Rd, off road on R1, cross refuge at Fullerton St, off road on R1 approximately 70m to service road on bridge approaches.	Short section of off road path required from service road to stairs.	Construct shared path.			
	Cross bridge on pedestrian footway in centre.	Construct short off road section to connect to service road (approximately 30m).	Construct shared path.			
	On road service road, Teal St, Cormorant Rd, Tourle St.	Some narrow sections. Improve markings at roundabout at Teal St/Cormorant Rd.				
	Cross bridge on off road path, or on road on shoulder.					
	Continue on road on Tourle St.	Some narrow sections. Shoulder widening required in parts.				
		Existing off road path extends approximately 180m from Industrial Dr. Potential to extend off road path approximately 480m.		Long	High	
	Local Routes					
L1	**Lenaghans Dr to Maryland**					
	Proposed off road on former South Maitland railway corridor at Fletcher and Hunter Water Corporation pipeline to Balarang St Maryland.	Approximately 4km, includes existing tunnel under F3 and Lenaghans Dr. High cost route, potential environmental and land use and ownership issues. Section of route northeast of Kurraka Dr Fletcher constructed. Adjoining western section scheduled for construction 2012 and eastern extension to S7 scheduled for construction 2013-15 in conjunction with adjacent development.	Construct approximately 4km off road shared path. Monitor for opportunities to construct sections in conjunction with other works and development in Blue Gum Hills.		High	
	On road Maryland Dr to Minmi Rd (eastern intersection).		Symbols, signs where required.	Short	Low	2,000
L2	**Maryland to Wallsend**					
	Off road on existing path north side Minmi Rd from Maryland Dr (east) to signals at Macquarie St.	Existing path.				
	Proposed on road Macquarie St from Minmi Rd/R10, to Kenrick St, then Devon St, Bousfield St and Ganney Rd to R5.	Access to Callaghan High (Wallsend Campus), Wallsend pool, commercial area, library, etc.	Symbols, signs 2km.	Short	Low	5,000
L3	**Wallsend to Jesmond**					
	Proposed on road from R5 across Cowper St onto Murnin St, Elermore Pde, Cressington Way, Douglas St, Birchgrove Dr, Victory Pde to R3, R5.	Some steep sections; inconvenient access from R5 requires assessment. Access to R3 to be considered with extension of H23.	Symbols, signs 3.7km. Investigate access options across Cowper St.	Short	Low	9,500
L4	**Wallsend to New Lambton Heights**					
	On road from R5 across Cowper St onto Brooks St, off road via existing path in Wallsend Park to Thomas St/Walford St signals.	Refuge access across Cowper St to Wallsend Park completed 2012				

	DESCRIPTION	STATUS/NOTES	WORKS/ACTIONS	TIME	COST	$
		Signpost existing path as a shared path through Wallsend Park from Cowper St to Walford St. Approval required. Monitor use to determine requirement for future widening.	Symbols, signs.	Short	Low	
	Cross at signals at Thomas St, on road Walford St, Cardiff Rd, Croudace Rd, McCaffrey Dr to R3 at Lookout Rd.	Steep sections, narrow sections, moderately heavy traffic in parts. Access to John Hunter Hospital.	Symbols, signs.	Short	Low	
L5	**Wallsend to Cardiff Rd (Lake Macquarie)**					
	On road from L4 at Croudace Rd/Cardiff Rd along Cardiff Rd to Lake Macquarie LGA boundary.	Narrow on Cardiff Rd.	Symbols, signs 1.1km.	Short	Low	3,000
L6	**Wallsend to Jubilee Rd (Lake Macquarie)**					
	On road from R5/Turrama St, on Turrama St, Rundle Ave, across Lake Rd to existing off road connection to Jubilee Rd.	Off road path 35m approximately required from Rundle Ave to refuge at Lake Rd crossing. Refuge crossing of Lake Rd challenging, volumes increasing.	Symbols, signs 370m. Construct 35m shared path at Rundle Ave to Lake Rd.	Short	Low	20,000
	On road Jubilee Rd to Lake Macquarie LGA boundary.	Moderate traffic, some narrower sections, roundabouts. Access to school.	Symbols, signs 1.5km.	Short	Low	4,000
L7	**Maryland Dr to Churnwood Dr Link**					
	On/off road Maryland Dr from L1/Gundaroo Cct to Minmi Rd/Churnwood Dr.	Some off road sections, access to Glendore School, community centre.	Symbols, signs 850m.	Short	Low	2,100
L8	**University to John Hunter Hospital**					
	On road from R8 at Sandgate Rd onto Vale St and private road across H23 to research facility/University.	Investigate land tenure issues, confirm approvals as required.	Confirm approvals, symbols, signs 200m.	Medium	Low	500
	Off road University/H23 from research facility to Newcastle Rd service road.	Existing off road path. Connections to adjoining roads, shopping centre, schools, shared paths. Parts on private land, confirm approvals as required.		Medium	Low	
	On road, service road off Newcastle Rd to Coles St, cross Newcastle Rd at traffic signals.	Existing path. Review signage and markings.	Symbols, signs.	Medium	Low	
	Off road on path south side Newcastle Rd to Robinson Ave.					
	On road Robinson Ave to R5.		Symbols, signs 400m.	Medium	Low	1,000
		Alternative route to section off road south side of Newcastle Rd and on road Robinson Ave is off road from crossing of Newcastle Rd through Jesmond Park to meet R5. Investigation and cost estimates required.	Investigate.			
	Off road on R5, then on track to John Hunter Hospital.	Very steep track from R5 to John Hunter Hospital. Audit to determine if improvements can be made.	Symbols, signs approximately 500m.	Medium	Low	
	On road John Hunter Hospital roads to Lookout Rd.	Private land, obtain approvals where required.	Approvals required. Symbols, signs approximately 1.6km.	Medium	Low	4,000
	Off road on path western side Lookout Rd to R3 at John Hunter Hospital southern access/H23.	Investigate widening of 200m narrow section between hospital entrances.		Long	Medium	85,000
L9	**Lambton to H23 Kotara (R5 to R3)**					
	On road from R5 Howe St/Tyrone Rd to Lambton Rd, Regent St, Queens Rd, Orchardtown Rd, Grinsell St, to Carnley Ave opposite Carisbrooke Ave.	Some congestion in shopping centres. Connections to pool, parks, schools, shopping centres, Blackbutt Reserve. Some steep sections, some moderate traffic volumes.	Symbols, signs 4.4km.	Short	Low	11,000
	Off road on shared path south side Carnley Ave to Lookout Rd/R3.					

	DESCRIPTION	STATUS/NOTES	WORKS/ACTIONS	TIME	COST	$
L10	**Callaghan to Georgetown (University to R6)**					
	Off road on path from R6 in University to east gate, across signals to proposed on road Stannett St, Allowah St, Acacia Ave, Traise St, Christo Rd to Georgetown Rd.	Some narrow sections, some steep, some moderate speed/volumes e.g. on Acacia Ave.	Symbols, signs 3.7km, include bike crossing in signals at east gate of University.	Medium	Low	10,000
		No road shoulder on Acacia Ave between Greystone St and Alnwick Rd. Road widening programmed for 2012.	Road widening.	Short	Medium	
		Crossing of Lambton Rd near Christo Rd via short off road section to traffic signals on Lambton Rd. Path requires upgrading to shared path standard. Kerb ramps and refuges on Christo Rd do not comply and require upgrading. Alternative is to cut refuge into medians on Lambton Rd to allow continuity for cyclists on Christo Rd.	Improve crossing of Lambton Rd.			
	Route continues on Georgetown Rd, then Clyde St to R4, TAFE and R6.	Investigate options from Christo Rd to Clyde St for safe crossing of Georgetown Rd and to bypass roundabout.	Investigate options.			
		As per notes R4, negotiate route through TAFE (option is on road via Chinchen and Hubbard St).				
L11	**Waratah to Lambton**					
	Off road from Acacia Ave/L10 to Nerong Rd.	New off road connection Acacia Ave to Nerong Rd 50m.	Construct 50m shared path connecting Acacia Ave to Nerong Rd.	Short	Low	25,000
	On road Nerong Rd, Hill St, Morehead St (crossing Newcastle Rd at signals), then to Howe St/R5.	Steep sections, generally low/moderate traffic. Safe crossing of Newcastle Rd at Morehead St signals. Access to University via L10, also to Lambton shops, library, park and pool, and to R5.	Symbols, signs 830m.	Short	Low	2,100
		Signals require upgrading to incorporate cycle lantern. RMS approval required.	Request RMS to modify Newcastle Rd/Morehead St signals.			
L12	**University to Warabrook (Pacific Hwy)**					
	Off road on existing path and overbridge from University to Warabrook Station car park.	Approval required.	Symbols, signs.	Short	Low	
	Off road on proposed path west of Eucalyptus Cct (S5) then off road on proposed shared path north of and adjacent to Coachwood Dr, then off road on proposed shared path on old road corridor to Pacific Hwy/Maitland Rd.	Proposed path (S5/L12) approximately 250m.	Construct shared path approximately 250m.		High	RMS
		Proposed path north of and adjacent to Coachwood Dr approximately 550m.	Construct shared path approximately 550m.		High	
		Proposed path from north of Coachwood Dr to Pacific Hwy/Maitland Rd approximately 540m.	Construct shared path approximately 540m.		High	
L13	**Waratah to University via Warabrook**					
	Proposed on road from R6/Braye St on Hanbury St, across road closure to Railway Tce, Cadell Ave, Leonard St, Frith St, Adrian St, Stedman St to Maitland Rd.	Hanbury St, Railway Tce high volumes, congestion, difficult for cyclists. Cross Hanbury St at zebra eastbound. Investigate new refuge on Hanbury St at Braye St for west bound cyclists as per R6.	Symbols, signs 2.1km.	Medium	Low	6,000
	Proposed off road on shared path to traffic signals at Maud St, across to western side, on shared path to Carandotta St.	Some trees, some driveways in Maitland Rd. Requires investigation.	Construct off road shared path in Maitland Rd: 290m Stedman St to Carandotta St crossing Maud St at signals.	Medium	High	200,000
		Signals require upgrading to incorporate cycle lantern. RMS approval required.	Request RMS to modify signals.			

	DESCRIPTION	STATUS/NOTES	WORKS/ACTIONS	TIME	COST	$
	Proposed on road Carandotta St, then off road on pathway at Nos 39/41, to Casuarina Cct. On Casuarina Cct, Warabrook Blvd, Eucalyptus Cct to Warabrook Station.	Quiet local streets.	Symbols, signs 830m.	Short	Low	
		Narrow pathway Carandotta St to Eucalyptus Cct.	Widen pathway. Length approximately 75m.	Short	Low	35,000
L14	**Waratah Station to Mayfield East**					
	Proposed on road from Hanbury St/L13/R6 to Braye St, Nile St, Church St, Crebert St to Ingall St/L15/Mayfield East Public School.	Cross Maitland Rd at Nile St/Church St signals. Low to moderate traffic, some congestion, extensive parking near Maitland Rd. No pedestrian phase at lights. Long term potential for upgrade of signals and off road sections to access new cycle phases of signals.	Symbols, signs 2.3km.	Short	Low	6,000
L15	**Mayfield to Mayfield North**					
	Proposed on road from Scholey St/R6 at Nelson St intersection, Lord St, Silsoe St, cross Maitland Rd at signals, then Carrington St, Park St, Ingall St to Industrial Dr/R2 at signals.	Access between TAFE/Islington and BHP site, Mayfield East Public School, with a safe crossing of Maitland Rd at traffic signals. Could be developed with off road link at signals.	Symbols, signs 1.9km.	Short	Low	5,000
L16	**Broadmeadow to Georgetown**					
	Proposed on road Darling St at Racecourse/L18, then on Melville Rd (part R1), Coorumbung Rd, Graham Rd (under bridge), Young Rd, Market St to overbridge.	Circuitous but avoids crossing Lambton Rd at signals. Some congestion, heavy parking around Broadmeadow Station.	Symbols, signs 2km.	Short	Low	5,000
			Investigate short 25m shared path in Market St.	Short	Low	
	Off road Lambton Rd overbridge (north side) to Moira Rd.	Existing off road path on overbridge. Short off road connection to Moira Rd required.				
	Proposed on road on Moira Rd to proposed off road section east side of Curley Rd, cross Curley Rd at proposed refuge, then on road Curley Rd, Broadmeadow Rd to L10 at Christo Rd.	Consider off road path west side of Broadmeadow Rd from Jackson St through to Griffiths Rd, then on road. Intersection treatment at Griffiths Rd requires cycle lanterns and short sections of shared path to access signals.	Symbols, signs 1.6km. Construct 90m shared path from overbridge to Curley Rd.	Medium	Medium	50,000
	Proposed on road on Chatham Rd to Young St, on road Young St to Waratah Park, off road through Waratah Park to Platt St.	Off road path through Waratah Park completed 2011.	Symbols, signs.	Short	Low	
L17	**Hamilton**					
	Proposed on road on Steel St from Dumaresq St at Broadmeadow Racecourse, across Tudor St at traffic signals to Lindsay St, then Samdon St to Donald St/R5 at traffic signals.		Symbols, signs 1.2km.	Short	Low	3,000
L18	**Adamstown to Hamilton South**					
	Proposed on road from R1 at Teralba Rd on Victoria St, Brunker Rd, Lockyer St, James St, Glebe Rd, Hassall St, Darling St, Beaumont St to Dumaresq St/R1.	Possible use of zebra crossing of Brunker Rd at Victoria St. Introduce 40km/h high pedestrian area with traffic calming devices to lower speed environment (scheduled for completion 2011).	Symbols, signs 3.8km.	Medium	Low	9,500
		Difficult crossing of Glebe Rd between James St and Hassall St both ways.	Provide alternative route via June St then shared path to signals, cross Glebe Rd, then shared path to Hassall St.	Short	Medium	60,000
			Investigate crossing improvements at Glebe Rd between James and Hassall Sts.	Long	High	

	DESCRIPTION	STATUS/NOTES	WORKS/ACTIONS	TIME	COST	$
L19	**Hamilton South (Gordon Ave) to R5**					
	On road Gordon Ave from Dumaresq St/R1 to Donald St/Parry St/R5.	Some existing markings.	Symbols, signs (especially north of Tudor St).	Medium	Low	2,500
L20	**Stockton**					
	From ferry terminal, proposed on road on Mitchell St to Stone St, then on road on Barrie Cres to Griffith Ave, then Griffith Ave to Eames Ave, then on road on Meredith St to R1 at Fullerton St.		Symbols, signs 2.7km.	Short	Low	
		An off road path from S2 to connect to R1 near Fullerton St via shared path east side of Pitt St and east side of Mitchell St is currently under investigation as part of the Coastal Revitalisation project.				
L21	**New Lambton to Fernleigh Track and Teralba Rd (R1)**					
	On road from L9/Regent St on St James Rd to east of Kings Rd. Off road on north side of St James Rd to refuge. Cross St James Rd at refuge and continue off road through the level crossing to Park Ave.	Traffic congestion at Bridges Rd signals, Adamstown rail crossing. Off road section between Kings Rd and Park Ave provided.	Symbols, signs 1.1km	Short	Low	3,000
			Investigate feasibility of provision of off road path from Mackie Ave through Adamstown railway gates to Teralba Rd.	Short	High	350,000
	Off road on western side Park Ave shared path to R1 opposite Victoria St.					
L22	**Tighes Hill TAFE - Hamilton**					
	Proposed on road Chinchen, Fern, Beaumont Sts to R5/R12/Donald St at Hamilton.	Some issues crossing Hubbard St, also Beaumont St (eastbound).	Symbols, signs 1.4km.	Short	Low	3,500
L23	**John Hunter Hospital to R4/Turton Rd**					
	Off road on existing shared path from L8 to traffic signals at Lookout Rd/John Hunter Hospital access, cross to east side.					
	Off road on footway to Carrington Pde.	Existing footpath requires widening for two-way shared path.	Construct 75m off road shared path, widen and convert existing median to refuge.	Medium	Medium	50,000
	On road Carrington Pde, Brett St, Curzon Rd, Carrington Pde, Regent St (L9) then Victoria St, Burke St, cross Bridges Rd at existing signals to Sketchley Pde to Mackie Ave/R4.	Consider ramp adjacent to stairs on Carrington Pde to provide a more direct route.	Symbols, signs 2.5km.	Short	Low	6,500
L24	**Merewether to The Junction**					
	On road from Curry St on Mitchell, to Union St/R7A and The Junction.	Refer to R7A for proposed treatment on Union St.	Symbols, signs 965m.	Short	Low	4,500
L25	**Bar Beach**					
	On road Parkway Ave from R1/Corlette St to Memorial Dr.	Roundabout at Darby St has line marking - option to use paths to bypass.	Symbols, signs 750m.	Short	Low	2,000

	DESCRIPTION	STATUS/NOTES	WORKS/ACTIONS	TIME	COST	$
	Cross Memorial Dr to S1 at Bar Beach.	Improved access across Memorial Dr required. This is currently under investigation as part of the Coastal Revitalisation project (Bathers Way Public Domain Plan).	Signpost connection, provide widened paths as required.	Medium		
L26	**Maryland Dr to Minmi Rd**					
	Proposed on road Boundary Rd from Maryland Dr to Warkworth St, proposed on road Warkworth St to Berrico St, then off road path to Minmi Rd and cross to R10 at existing refuge.	Provides connection for Fletcher residents to Maryland facilities via refuge and path to Oak Cl.	Symbols, signs 850m.	Short	Low	2,200
L27	**Merewether to Newcastle West/Throsby Creek Shared Pathway**					
	Proposed on road Llewellyn St from Morgan St/R7 to Railway St, on Railway St to National Park St.	Access to shops and facilities, schools, Newcastle West. Several roundabouts, concrete road joints a safety issue but volumes generally low to moderate.	Symbols, signs 380m.	Short	Low	1,000
	Proposed on road National Park St crossing Glebe Rd at traffic signals, continue to Hunter St/R5.	Part road closure in National Park St north of Glebe Rd. Congestion north of Parkway Ave. Primary east west route is currently being investigated.	Symbols, signs 1.5km. Provide paths to allow cyclists to exit southbound through National Park St part closure.	Short	Low	14,000
	Off road on southern side of Hunter Street from National Park St to Bellevue St/Hunter St traffic signals		Upgrade existing path to shared path (signs, markings).	Short	Low	2,000
	On road Bellevue St, Beresford St to Stewart Ave level crossing.	Forward angle parking on Beresford St can create conflict with vehicles exiting parking spaces.	Change to reverse angle parking.			
	Off road on western side of Stewart Ave/Hannell St over level crossing, cross Honeysuckle Dr at signals and connect to Throsby Creek shared pathway via a connection between Hannell St footpath and old Lee Wharf Rd at location of existing informal track.	Hannell St has trees and other constraints that will need to be addressed through the risk assessment process prior to upgrading to shared path.	Upgrade existing path to shared path, construct 15m new shared path link between Hannell Street and old Lee Wharf Road.	Short	Low	20,000
L28	**Waratah Local**					
	Proposed on road from Christo Rd/L10 on Harriet St, High St, Bridge St to R6/Prince St.		Symbols, signs 1.8km.	Short	Low	4,500
L29	**Carrington Loop to Hamilton**					
	Proposed on road from R2/Hannell St on Cowper St, Young St, Elizabeth St to R2/Hannell St.	Access to shops, school.	Symbols, signs 1.9km.	Short	Low	2,500
	Cross Hannell St to Branch St, on road Branch St, Albert St, Ivy St and Fern St to L22/L40.	Provides connection for Carrington residents to Hamilton shopping district. Upgrading of off road bypasses of the Hannell St roundabout required.	Upgrade off road roundabout bypasses	Short	Low	
L30	**Merewether Beach Link (R7 to Dixon Park)**					
	Proposed on road on Berner St from R7 (intersection at Morgan St) to Ocean St.		Symbols, signs 920m.	Short	Low	
		On road facility proposed for Ocean St north and investigation of connection to S1 (Bathers Way) north.	Symbols, signs 490m.	Short	Low	
	Proposed on road on Berner St to John Pde.		Symbols, signs.	Short	Low	
	On road John Pde.	Works to be undertaken in implementing the Merewether Public Domain Masterplan include conversion of John Pde to one-way and contra-flow bike lane.		Short	High	

	DESCRIPTION	STATUS/NOTES	WORKS/ACTIONS	TIME	COST	$
L31	**John Hunter Hospital to Wallsend Link**					
	Proposed off road from L8 at John Hunter Hospital through bushland to connect to proposed on road on Elermore Pde and Cressington Way.	Ridgeline link from John Hunter Hospital to Elermore Pde Wallsend. Bushland route - investigate route feasibility and construction standards.	Investigate in longer term.	Long		
		Investigate additional links (e.g. to Bellinger Cl).		Long		
L32	**Braye Park Links**					
	Proposed on road from L10 at Acacia Ave, on Allowah St to end of Allowah St at Braye Park.	Route through Braye Park provides alternative to L10.	Symbols, signs 540m.	Short	Low	1,250
	Off road in Braye Park to Clarence St.	Existing off road route. Alternative route is off road path through Braye Park to High St, to join L28 at Bridge St, then L28 to L10.				
	On road Clarence St, rejoin L10 at Christo Rd.		Symbols, signs 450m.	Short	Low	1,250
L33	**Minmi to Maryland Dr West**					
	Off road shared path adjacent to Minmi Rd north side from intersection at Woodford St to Maryland Dr west.	Some sections of path have been completed. Path to be extended and connected in line with future development.	Construct section from Woodford St to west of Brookfield Rd, 1750m.		High	
			Construct section east of Brookfield Rd to west of Kurraka Dr, approximately 1070m.		High	
		Construct section from east of Awabakal Dr to Maryland Dr west.	Construct shared path section 350m.	Short	High	800,000
L34	**Foreshore (S1) to King Edward Park (S1)**					
	Proposed shared path east side of Watt St between S1 at foreshore east of roundabout on Wharf Rd and Scott St.	Construction of raised pedestrian crossing east of roundabout on Wharf Rd completed in 2011.	Symbols, signs approximately 180m.			
	Cross Scott St at traffic signals.	Signals require upgrading to incorporate cycle lantern. RMS approval required.			Low	
	Proposed protected two-way lanes between Scott St and Church St.	Reconfigure carriageway to allocate road space for bike lanes.	Construct two-way protected bike lanes 360m.	Long	High	
	Cross Shortland Esp at cycle refuge, then off road on proposed shared path on east side of Watt St to S1.	Refuge constructed during 2011. Narrow carriageway to allow for widening of existing footway to shared path standard.	Upgrade footpath to shared path standard approximately 180m.	Long	High	
L35	**Wharf Rd (Ferry Terminal) to Watt St**					
	Proposed on road Wharf Rd from Ferry Wharf, then on Shortland Esp to Watt St.	Shortland Esp not marked. Investigate under Newcastle Coastal Revitalisation projects.	Symbols, signs 2.2km.		Low	5,500
L36	**R11 to Beresfield Station**					
	On road John Renshaw Dr to north bound slip lane to New England Hwy.	Short existing off road section to allow safer crossing of Kinta Dr. Marked on shoulder.				
	Off road on path to New England Hwy, cross north bound lanes of highway, off road path through median, cross south bound lanes.	Off road path required from western side of New England Hwy to northern side of John Renshaw Dr western bound slip lane.				
		Investigate off road link to Allendale St.				
	On road Allendale St, to intersection with Anderson Dr, on road Anderson Dr/R2 to Lawson Ave, on road Lawson Ave through centre to Beresfield Station.					
L37	**R3A Wetlands Place Link**					

	DESCRIPTION	STATUS/NOTES	WORKS/ACTIONS	TIME	COST	$
	Proposed off road link from R3A to potential redevelopment of Astra St golf practice range.			Long	High	
L38	**Wallsend Park to Dangerfield Dr**					
	Proposed off road shared pathway from Walford St/Thomas St traffic signals. Route follows Ironbark Creek through Upper Reserve, Croudace Road Reserve, crossing Croudace Rd west of Sherwood St, Jarvis Close Reserve, crossing Cardiff Rd adjacent to Ironbark Ck, Elermore Vale Park, crossing Grandview Rd west of Croudace Rd and Croudace Rd south of Grandview Rd to connect to Dangerfield Dr.	Route requires feasibility study to determine viability and extensive planning. Crossings of Ironbark Creek will likely be required, along with major road crossings.		Long	High	
		Investigate links from Dangerfield Dr to L31 to complete connection between John Hunter Hospital and Wallsend/Elermore Vale.				
L39	**National Park Links**					
	Proposed east-west and north-south off road paths through National Park as proposed in the draft National Park Plan of Management. Links will provide local access to Marketown, and connect to the R1 investigation route. The links will also provide off road alternatives to R1 on Union St and Parkway Ave.	Exhibit draft National Park Plan of Management and seek Council approval of proposed shared pathways.	Construct shared pathways.	Long	High	
L40	**Mayfield West to Hamilton**					
	On road George St from L15 (Ingall St) to Industrial Dr.		Symbols, signs 580m.			
	Off road on shared path on southern side of Industrial Dr from George St over rail overbridge to William St.	Existing shared path over rail bridge requires upgrading to a usable standard. The existing path currently finishes 135m prior to George St, and requires extending.	Upgrade existing shared path, construct 135m new shared path.			
	On road William St, Lewis St, Morgan St and Mary St to Maitland Rd.		Symbols, signs 580m.			
	Off road on northern side of Maitland Rd from Mary St to Beaumont St traffic signals/L22/L29.	Investigation of existing path required to determine level of upgrade required.	Upgrade 40m existing path to shared path.			
	On road Beaumont St to Hamilton shopping centre.	As per L22.				
L41	**Hunter Stadium (R4/R5) to Waratah Park**					
	Off road eastern side of Turton Rd signals from R4/R5 at the Hunter Stadium on existing shared path to Griffiths Rd traffic signals.	Existing path				
	Cross Griffiths Rd at traffic signals.	Upgrade northern Turton Rd exit slip lane to include pedestrian crossing/pedestrian cyclist phase.				RMS
	Off road Turton Rd on eastern side to unnamed lane north of City of Newcastle works depot.	Construct new shared pathway. One power pole will require relocation.	Construct shared path 240m	Medium	High	
	On road unnamed laneway, Asher St, cross Georgetown Rd at pedestrian crossing, and Parkview St to L16/Waratah Park.	Bollards are spaced too closely at the end of the unnamed laneway preventing pedestrians and cyclists from entering.	Replace bollards with complying terminal treatment. Signs, symbols 1km.	Short	Low	

Scenic/Recreational Routes

	DESCRIPTION	STATUS/NOTES	WORKS/ACTIONS	TIME	COST	$
S1	**Throsby Foreshore to Merewether Baths** Note: All works in this section will be dependent on the outcomes of current public domain, traffic and parking investigations being undertaken as part of the Coastal Revitalisation project.					
	Proposed off road on northern side of Throsby foreshore from Hannell St, on road Tighes Tce, proposed off road on foreshore to connect to existing path Islington Park, continue on Throsby foreshore south side (as per R6).	Negotiations required with Hunter Water Corporation.				
	Proposed off road from R6 at Wickham along foreshore to Nobbys.	Foreshore path to be completed with future development of Honeysuckle.				HDC
		Foreshore is not officially marked as a shared path, but is currently used by bike riders. Investigate options.	Signs.			
		Extend path eastern end of foreshore at end of Tugberth Rd approximately 290m to connect to path at Nobbys.	Widen existing footway.			
		Bathers Way Coastal Walk currently extends from Nobbys headland to Merewether Beach. Council is currently investigating the feasibility of upgrade of the route to accommodate pedestrians and bike riders (Bathers Way Public Domain Plan). Investigations are being undertaken as part of the Coastal Revitalisation project, in conjunction with investigation of options for Shortland Esp for one way traffic. Path is currently highly utilised by pedestrians. The works listed below are possible options for consideration as part of this project.				
	Proposed off road from Shortland Esp to Watt St through Fletcher Park.	Construct shared path through Fletcher Park. Investigate feasibility of widening existing path or constructing new route.	Construct shared path.			
	Off road on proposed shared path on east side of Watt St to southern end of Fletcher Park.	Works as per L34 - upgrade footpath to shared path standards approximately 180m.				
	Proposed off road on shared paths Ordnance St, Reserve Rd to The Terrace.	Approximately 480m shared path required south side Ordnance St, Reserve Rd.	Mark and signpost approved route. Construct shared path 480m.	Medium	High	250,000
	Proposed off road on shared path east side of The Terrace to connect to existing paths Cliff St and Memorial Dr to Bar Beach car park.	Possible conflict with pedestrian. Steep sections.	Construct shared path east side of The Terrace, approximately 300m.			
	Off road on pathway east side Bar Beach car park to pavilion.	Construction to commence 2011.			High	
	Proposed off road from Bar Beach pavilion to Dixon Park pavilion then Merewether baths,	Steep sections, conflict with pedestrians at busy times. Upgrades to be investigated as part of the Coastal Revitalisation project.				
		Works to be undertaken in implementing the Merewether Public Domain Masterplan include off road paths from Dixon Park to Merewether ocean baths. Works to be initiated 2011/12.				
S2	**Stockton Foreshore - Break Wall to Port Stephens**					
	Off road from break wall to Chester St.	Existing route from break wall to Punt St. Punt St to Chester St completed in 2010. Cost shared between Department of Planning and Council.				
	Off road from Chester St to Port Stephens LGA boundary.	Construction of shared path to be completed 2012.	Construct shared path (3.3km).	Short	High	
S3	**District Park Circuit**					

	DESCRIPTION	STATUS/NOTES	WORKS/ACTIONS	TIME	COST	$
		Bridge from R4/R5 to S3 constructed 2011. Section of S3 from bridge to Curley Rd constructed 2011.				
		Shared fitness track, to be considered in future development of area. Excludes R4/R5.	Construct off road shared path approximately 2km.			
S4	**Waratah Park Circuit**					
		Shared fitness track.	Construct off road shared path approximately 1.4km.	Long	High	700,000
S5	**Warabrook Wetlands Tracks**					
		Extension of existing recreational shared paths. Staged work. Construct path west of Eucalyptus Cct as per L12 to connect to existing path north of Eucalyptus Cct (approximately 250m).	Construct shared path from existing path at Eucalyptus Cct to car park/path to Station and University, approximately 310m.	Medium	High	155,000
			Construct shared path from existing path at southern end of Decora Cres to Pacific Hwy, including a connection north across the Pacific Hwy rail bridge to the Sandgate industrial area at Ayrshire Cres, and a connection to the northern end of Decora Cres, approximately 1100m.	Long	High	350,000
S6	**Lambton Park Circuit**					
		Shared path adjacent to Howe St, Durham Rd and part Karoola Rd completed 2010. Remaining section from Bowling Club on Karoola Rd to Morehead St programmed for completion 2011/12.	Construct shared path.	Short	High	300,000
S7	**Maryland Wetlands and Local Tracks**					
		Some paths already exist. Focus is recreation. Section from Minmi Rd to Ajax Ave, adjacent to Maryland Dr east, completed 2010.				
		Construction of paths from intersection of Maryland Dr and Ajax Ave through Bill Elliot Oval to Hardes Ave and Maryland Dr, across Maryland Dr at the skate park and through Grange Avenue Reserve, across Boundary Rd and through the reserve south of Rosamond St to connect to Kensington Gr will require further investigation to determine feasibility and address constraints. Route modification may be required.	Construct shared paths, approximately 1.5km, subject to investigations.	Medium/Long	High	
		Proposed on road path on Kensington Gr, Tomaree Way, Moonan St and Hampton Way.	Symbols, signs 430m.	Long	Low	
		Upgrade footpath from Hampton Way to Maryland Dr west to shared path standard.	Upgrade path, approximately 180m.	Long	High	
S8	**Federal Park Track Wallsend**					
		Connect Wallsend Pool and Callaghan High Wallsend Campus to Wallsend business centre. This is a long term project to be considered in conjunction with future development of 1A Minmi Rd.	Construct shared paths.	Long	High	410,000
S9	**Hunter Wetlands National Park**					
		Extension of existing path system - recreational/educational focus. Changes to the boundaries of the Hunter Wetlands National Park were gazetted in February 2011, to incorporate the Kooragang Rehabilitation Project. Council to ensure ongoing communication with the National Parks and Wildlife Service for identification of bike paths in Plan of Management.	Ensure ongoing communication with the National Parks and Wildlife Service to identify paths in the Plan of Management.			

	DESCRIPTION	STATUS/NOTES	WORKS/ACTIONS	TIME	COST	$
S10	**Throsby Creek Paths - Carrington/Wickham** Existing off road path around Throsby Creek foreshore from Cowper St bridge to Hannell St bridge, across Throsby Creek on eastern footpath.					
	Proposed off road shared path south side Elizabeth St to existing shared path along east side Throsby Creek to Kennedy Cove (near Arnold St).	Existing path is not sealed.	Construct off road shared path on south side Elizabeth St approximately 200m.	Long	High	120,000
		Investigate shared path from Kennedy Cove to boat launching ramp and back to Cowper St path to complete link.	Construct off road shared path from Kennedy Cove to Cowper St.	Short	High	200,000
S11	**Adamstown Park/Myers Park circuit**					
		Shared fitness track.	Construct off road shared path approximately 2km.	Long	High	
S12	**King Edward Park**					
		Existing roads and paths, some shared with traffic. Details of paths to be finalised as part of the Coastal Revitalisation project.				

Appendix 5 – Route Treatments

List of Figures:

Part 1 - On road shared and visually separated facilities

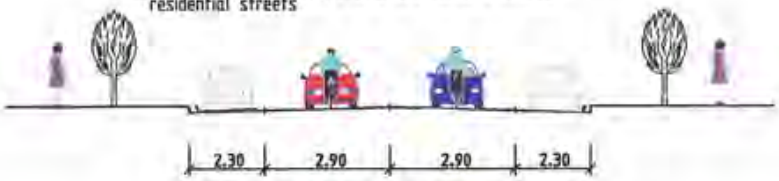
Part 2 – Physically separated facilities

PART 1 - ON ROAD SHARED AND VISUALLY SEPARATED FACILITIES

FIGURE 1.1 NARROW SHARED LANE (MIXED TRAFFIC - TIGHT PROFILE)

USE ON LOWER VOLUME (<5000 VPD)
LOCAL AND COLLECTOR ROADS

Notes
1. Maximum width of shared lane to be 3.3m
2. Edgelines may be required to define the shared lanes where carriageway width is above 10.6m
3. PS-2 (Bicycle) symbols to be located in the centre of the travel lanes when parking demand is high or in locations with no parking lanes, and in the parking lane where parking demand is low
4. Consider traffic calming devices to reduce traffic speed
5. Narrower carriageway widths are suitable in local residential streets

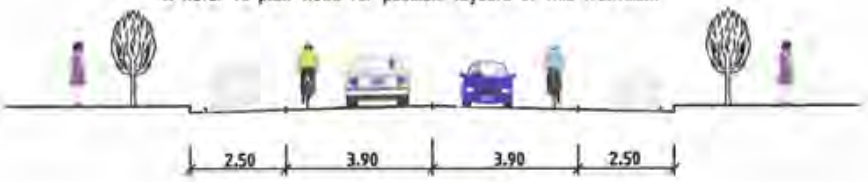


DIMENSIONS FOR 10.4m WIDE CARRIAGEWAY
WITH PARKING LANES

FIGURE 1.2 WIDE SHARED LANE (MIXED TRAFFIC - SPACIOUS PROFILE)

USE ON LOCAL, COLLECTOR ROAD
AND SUB ARTERIAL ROADS

Notes
1. Wide shared lane to be minimum 3.7m wide with PS-2 (Bicycle) symbols to be located on left side
2. Where edgelines are required, a green broken line is to be marked to the right of the edgeline, and PS-2 (Bicycle) symbols to the right of the green broken line. Bicycle lanes with green paint can be marked through high conflict side roads to highlight treatment
3. Consider traffic calming devices to reduce traffic speed
4. Refer to plan views for possible layouts of this treatment

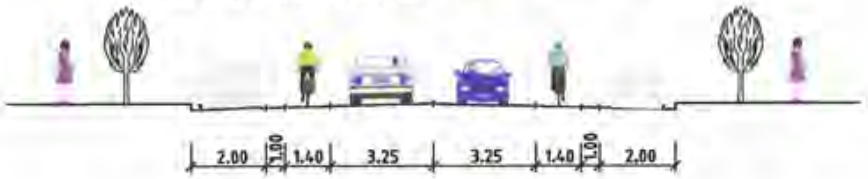


DIMENSIONS FOR 12.8m WIDE CARRIAGEWAY

FIGURE 1.3 BICYCLE LANE

USE ON HIGHER VOLUME (>5000 VPD) COLLECTOR AND
SUB-ARTERIAL ROADS WHERE SEPARATION IS CONSIDERED
NECESSARY AND PARKING DEMAND IS HIGH
ADVANTAGES: CAN ASSIST WITH TRAFFIC CALMING

Notes
1. PS-2 (Bicycle) symbols to be placed in the bicycle lanes
2. Green paint in the bicycle lanes can be considered in conflict areas, eg across side roads
3. To fit this treatment onto a 12.8m wide carriageway parking would need to be removed on one side



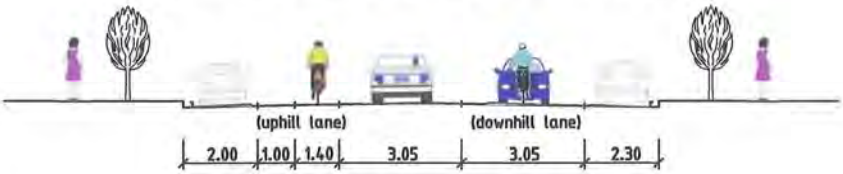
ABSOLUTE MINIMUM DIMENSIONS FOR 15.3m WIDE CARRIAGEWAY

FIGURE 1.4

SEPARATE UPHILL/DOWNHILL TREATMENT

USE ON LOCAL, COLLECTOR AND SUB-ARTERIAL ROADS

Notes
1. PS-2 (Bicycle) symbols should be placed in the centre of the downhill lane where there is a parking lane on this side to encourage cyclists to command the lane rather than ride in the car door opening zone



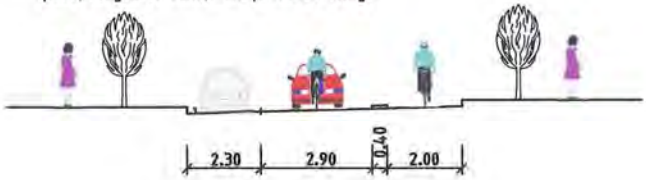
DIMENSIONS FOR 12.8m WIDE CARRIAGEWAY

FIGURE 1.5

CONTRA-FLOW LANE ON NARROW ONE-WAY STREET

USE ON LOWER VOLUME (<5000 VPD)/LOW SPEED LOCAL AND COLLECTOR ROADS

Notes
1. Maximum width of shared lane to be 3.3m
2. An edgeline may be required to define the shared lane where carriageway width is above 7.7m
3. PS-2 (Bicycle) symbols to be located in the centre of the travel lane and in the contra-flow bicyle lane
4. Consider traffic calming devices to reduce traffic speed
5. Consider green paint for the contra-flow bicycle lane
6. Median island can be replaced with a white L5 line in low speed (<40km/hr) environments
7. Width of contra-flow lane to be between 1.4-2.0m, depending on available space, length of lane, and predicted usage



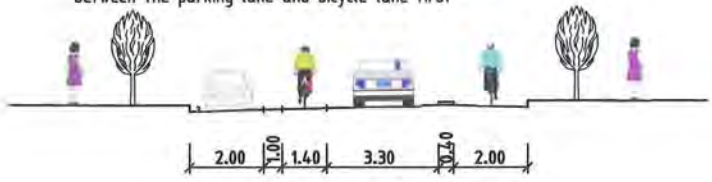
DIMENSIONS FOR 7.6m WIDE CARRIAGEWAY

FIGURE 1.6

CONTRA-FLOW LANE ON WIDE ONE-WAY STREET

USE ON HIGHER VOLUME (>5000 VPD) COLLECTOR AND SUB-ARTERIAL ROADS

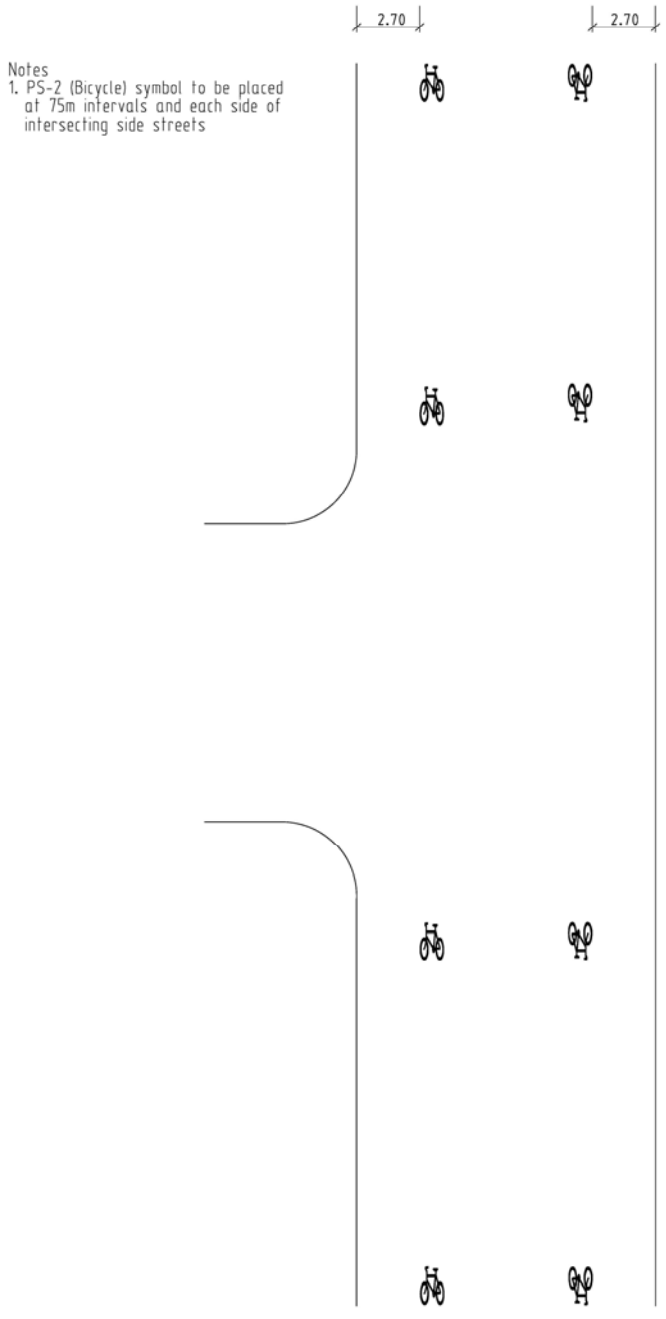
Notes
1. PS-2 (Bicycle) symbols to be placed in the bicycle lane and contra-flow bicycle lane
2. Consider green paint in the bicycle lane in conflict areas and in the contra-flow bicycle lane
3. Width of contra-flow lane to be between 1.4-2.0m, depending on available space, length of lane, and predicted usage
4. Any additional width available is to be allocated to the safety space between the parking lane and bicycle lane first



DIMENSIONS FOR 10.1m WIDE CARRIAGEWAY

WIDE SHARED LANE PLAN VIEW

A) FOR USE ON LOCAL AND COLLECTOR ROADS

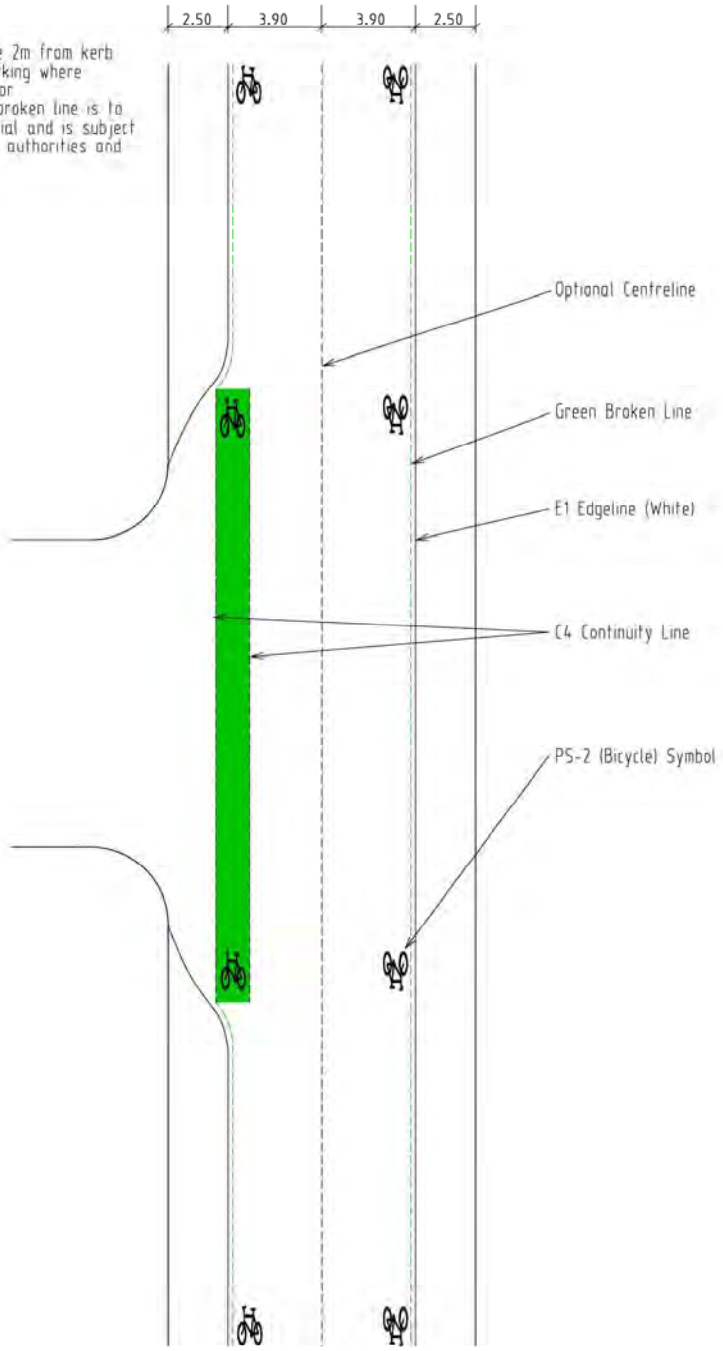


Notes
1. PS-2 (Bicycle) symbol to be placed at 75m intervals and each side of intersecting side streets

WIDE SHARED LANE PLAN VIEW

B) FOR USE ON COLLECTOR AND SUB-ARTERIAL ROADS

Notes
1. Consider additional line 2m from kerb to indicate limit of parking where parking discipline is poor
2. Installation of green broken line is to be undertaken as a trial and is subject to acceptance by road authorities and user groups



PART 2 - PHYSICALLY SEPARATED FACILITIES

USE ON SUB-ARTERIAL AND ARTERIAL ROADS
WHERE PHYSICAL SEPARATION IS REQUIRED
IN ACCORDANCE WITH FIGURE 3:
SEPARATION OF BICYCLES AND MOTOR VEHICLES
ACCORDING TO TRAFFIC SPEED AND VOLUME

FIGURE 2.1 SEPARATED OFF-ROAD PATH

FIGURE 2.2 SHARED OFF-ROAD PATH

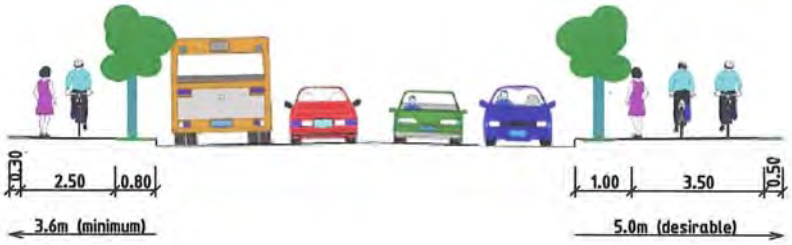
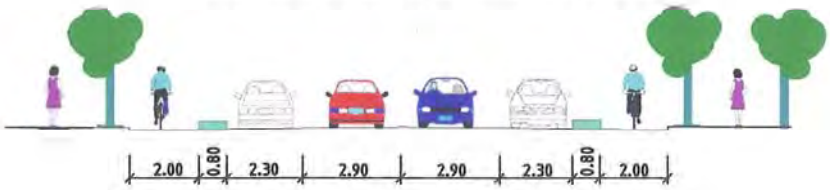


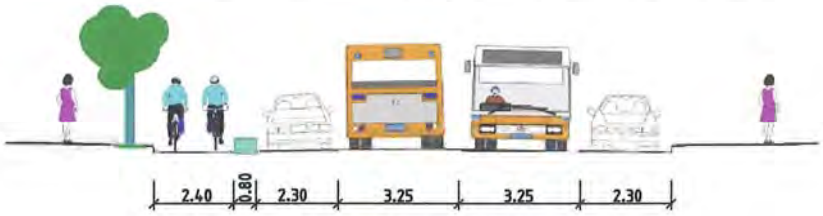
FIGURE 2.3 ON ROAD PHYSICALLY SEPARATED BICYCLE LANES

Note
1. Increase travel lane width to 3.25m minimum on bus routes



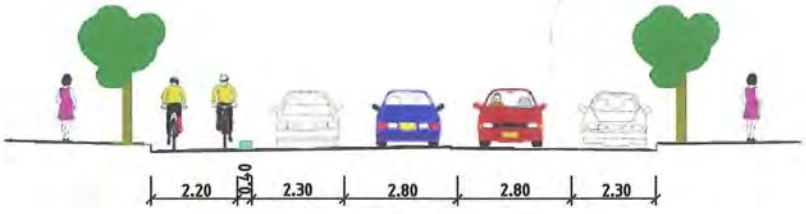
DIMENSIONS FOR 16.0m WIDE CARRIAGEWAY

FIGURE 2.4 ON ROAD BI-DIRECTIONAL PHYSICALLY SEPARATED BICYCLE LANE - BUS ROUTE



DIMENSIONS FOR 14.3m WIDE CARRIAGEWAY

FIGURE 2.5 ON ROAD BI-DIRECTIONAL PHYSICALLY SEPARATED BICYCLE LANE - NON BUS ROUTE



DIMENSIONS FOR 12.8m WIDE CARRIAGEWAY

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