TEN YEAR MASTER PLAN FOR TRUNK CYCLING AND WALKING PATH INFRASTRUCTURE 2004-14

FINAL REPORT

JOB NO: C03081

September 2004

TABLE OF CONTENTS

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

FIGURES

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

APPENDICES

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

ABBREVIATIONS

ACTPLA	ACT Planning and Land Authority
Brown	Brown Consulting (ACT) Pty Ltd
NCDC	National Capital Development Commission
NCA	National Capital Authority
JTW	Journey to Work
STP	Sustainable Transport Plan

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

1 EXECUTIVE SUMMARY

Introduction

In November 2003 W P Brown and Partners Pty Ltd, now Brown Consulting (ACT) Pty Ltd (Brown) was commissioned jointly by Roads ACT and the ACT Planning and Land Authority (ACTPLA) to undertake a study and produce a master plan for trunk cycle and walking path infrastructure in the ACT. The requirements for the consultancy were set out in the Study Brief (Brief No: AC03-25, Tender No: T03346) dated August 2003.

The objectives of the assignment can be summarised as:

- To provide a 10-year master plan that will guide prioritisation of capital works budget expenditure on trunk cycle and walking routes, and
- To assist in updating a GIS database of trunk cycle paths.

It should be noted that the scope of this study is limited to "trunk" routes using the path network and on-road cycle lanes only. Trunk routes, be they paths or on-road cycle lanes, are routes that primarily fulfil a transport function, particularly by commuters, as distinct from use for leisure, recreational or other activities.

A large amount of background data was collected and reviewed over the course of this study. These include previous reports relating to planning and feasibility assessments of numerous cycling and walking infrastructure components across the ACT from the 1970s up to the current Canberra Spatial Plan and Sustainable Transport Plan. The latter two documents set out the ACT government's current policy directions to develop the city in ways that, amongst other things enhance walking and cycling as preferred modes of transport for all Canberra residents.

On-Road Cycle Lane Survey

A survey was carried out to assess all on-road cycle lanes on arterial roads within the ACT. Data collected include location of the lanes, widths, line marking, cyclist signage, indicative pavement condition and hazard locations. The data was assembled as MapInfo format files compatible with ACTPLA's GIS system. 181 lane-kms of cycle lanes were found and surveyed on 960kms of arterial road. Of the 181 lane-kms approximately 12% (22km) was classified as complying with Austroads Part 14 design standards (albeit with the occasional sign missing) , 40% substantially complied with the Austroads standard (pavement symbols and signs were generally present although sometimes spaced too far apart), and the remaining 48% failed to comply due to missing signs and symbols or the lanes were too narrow. Only 5% (9km) fully complied with Austroads Part 14 1999 in all respects and a further 1% complied with respect to signs and markings but had insufficient lane width in relation to the adjacent road speed limit.

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Off Road Path Survey

A limited supplementary of selected off-road paths was part of the original brief for the study. However the off-road survey was deleted to conserve the budget after the on-road survey was extended beyond the originally planned scope. All information used in the study about existing off-road paths came from data held in ACTPLA's GIS database.

Deficiencies Identified by the Public

Existing databases of public complaints and comments were reviewed. These included data held on file at Roads ACT, correspondence to the Minister for Urban Services and Pedal Power's comments database.

Four two-hour public consultation sessions were held as part of this study. Members of the public were invited to advise of any missing links or deficiencies in the path network by either marking up large plans available at the public sessions or providing written submissions on comment forms. About a dozen key stakeholder organisations were also contacted directly and invited to participate in the study. Pedal Power ACT, which is a non government cycling lobby group, took up this opportunity. Over 100 people attended at least one of the public sessions and a total of over 400 comments/suggestions were received by the study team from all sources.

Travel Demand

Cycling and walking demand on the ACT trunk route network was assessed from a number of existing, albeit sparse, data sources. These included Journey to Work (JTW) data from the 2001 census, broad findings from a 1991 market survey of 1,000 Canberra households, various cyclist spot counts from 1991 – 1994 and limited central area counts from 2004. These data suggest that around 40% of the Canberra population cycle at least once per fortnight and about 20% each of these cycle to work or school.

Estimates were made using a gravity model of likely suburb to suburb origination-destination (O-D) pairs by walking and cycling in 2003 and 2013. Cycling and walking in the ACT show very dispersed trip making patterns and only eleven O-D suburb pairs showed 25 or more journey to work cycle trips per day in 2013 (assuming current mode split percentages). The main O-D travel demand relates to trips to the town centres, with the heaviest being trips between North Canberra and Civic.

Proposed Trunk Routes

A network of proposed trunk on-road cycle lanes and off road paths has been developed. The network seeks to fulfil several criteria including directly linking the town centres and other major origins and destinations, providing off-road alternatives to on-road cycle lanes in the more heavily used corridors, maximising the use of existing facilities and utilising flatter grades as much as practicable. The proposed network is shown as Figure E1 of this Executive Summary.

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Figure E1: Proposed Main Routes (1,707 KB)

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Proposed Works

Synergies exist with Roads ACT's annual resealing program where there is the opportunity to modify the existing lane configuration in conjunction with the resealing and allow provision of on-road cycling where practicable. The current (2004/05) resealing program has been reviewed. There are seven road sections on the current program which coincide with proposed trunk routes. These are located on Hindmarsh Drive, Drakeford Drive, Cotter Road and Yamba Drive.

A draft ten year capital works program has been developed to implement the proposed main route network. The following summarises the main work categories:

On-Road Cycling

- New On-Road Cycling
- New Symbols & Signs
- Widening, New Symbols & Signs
- Widening & New Signs
- New Signs
- New Symbols

Off-Road Cycling/Minor Streets

- New Signs
- New Symbols
- Reconstruction/Construction of New Routes
- Widening

Proposed works have been categorised into three priority groupings according to whether they should be built within 1 to 3 years, 4 to 7 years or 8 or more years from now. The indicative expenditure (all work categories) by priority is as follows:

Priority	Expenditure
On-Road	
Priority 1 (1-3 years)	$947,400
Priority 2 (4-7 years)	$3,175,610
Priority 3 (>8 years)	$1,328,400

The expenditure is based on no widening of the existing road carriageway

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Priority	Expenditure
Off-Road/Minor Streets	
Belconnen	
Priority 1 (1-3 years)	$72,176
Priority 2 (4-7 years)	$678,210
Priority 3 (>8 years)	$438,734
Gungahlin	
Priority 1 (1-3 years)	$46,264
Priority 2 (4-7 years)	$147,204
Priority 3 (>8 years)	$1,213,247
Inner North	
Priority 1 (1-3 years)	$250,522
Priority 2 (4-7 years)	$310,986
Priority 3 (>8 years)	$1,465,660
Inner South/City	
Priority 1 (1-3 years)	$89,680
Priority 2 (4-7 years)	$606,328
Priority 3 (>8 years)	$2,000,842
Tuggeranong	
Priority 1 (1-3 years)	$8,864
Priority 2 (4-7 years)	$112,480
Priority 3 (>8 years)	$597,314
Woden/Weston Creek	
Priority 1 (1-3 years)	$44,416
Priority 2 (4-7 years)	$284,220
Priority 3 (>8 years)	$570,020

Figure E2 of this Executive Summary shows the main network deficiencies to be addressed through the works program.

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Figure E2: Proposed Cycle Lanes and Shared Paths (1,654 KB)

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Benefits of Walking and Cycling Infrastructure

Numerous benefits may be attributed to increased walking and cycling in the ACT. They range from broad community benefits such as cleaner air and conservation of fossil fuels through reduced car travel, to user health benefits from increased physical activity and costs savings from cheaper travel. Existing walkers and cyclists will also benefit from safer, faster and more efficient travel on the proposed trunk network as it is progressively upgraded over the next 10 years. The proposed works are generally inexpensive (eg. improved signage and marking) and will be cost effective in providing network-wide benefits.

Conclusions and Recommendations

At the present time, it may be said that there is a wide consensus among transport and other professionals, and amongst public decision makers, that cycling and walking are beneficial modes of transport that should be encouraged as far as practicable, especially in preference to single occupant car travel. This is reflected in key public policy documents, such as the ACT Sustainable Transport Plan. However, there is currently much less of a consensus as to how to overcome the difficulties inherent in evaluating the benefits of specific cycling and walking infrastructure investments and to choose between completing options for spending public funds.

For the development of Canberra's trunk cycling walking infrastructure, the critical first step has been to define a city-wide network of trunk routes (on-road cycle facilities and off road paths). That has been done and shown on the master plan in this report.

The recommended steps for future action to implement the plan are to:

- Undertake feasibility studies on a corridor or district basis to quantify the physical works required and costs to upgrade all designated routes to the required trunk standard.
- Undertake separate planning and feasibility studies to further refine the path networks required for "trunk" (high volume) pedestrian routes in and through the five main town centres (Civic, Belconnen, Gungahlin, Woden and Tuggeranong).
- Implement administrative mechanisms within ACTPLA and Roads ACT to ensure that developer applications for off site works are reviewed for consistency with the trunk route master plan, especially for works around the town centres.
- Implement an administrative mechanism within Roads ACT to review future resealing and road maintenance programs against the trunk masterplan in order to maximise the synergies available from undertaking works on any route under more than one programme.
- Undertake the identified capital works so as to implement the proposed trunk route network progressively as funds permit over the coming years.

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

- Give greater recognition to the need for trip end facilities in future planning documents and policies in the ACT and consider introducing measures to encourage their provision in new development applications and retrofitting in existing high use areas.

BROWN CONSULTING (ACT) PTY LTD

September 2004

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

2 INTRODUCTION

In November 2003 Brown Consulting (ACT) Pty Ltd (Brown) was commissioned jointly by Roads ACT and the ACT Planning and Land Authority (ACTPLA) to undertake a study and produce a master plan that will guide the development of trunk cycle and walking path infrastructure in the ACT over the next ten years. The requirements for the consultancy were set out in the Study Brief (Brief No: AC03-25, Tender No: T03346) dated August 2003.

The Objective of the consultancy assignment has been set out in Section 2 of the brief. The overall purpose of the work is twofold and can be summarised as:

- To provide a 10-year master plan that will guide prioritisation of capital works budget expenditure on trunk cycle and walking routes, and
- To assist in updating a GIS database of trunk cycle paths.

The need to undertake this study was amplified by two particular concerns. Although Canberra already has an extensive network of cycleways they have been developed in the context of strategic planning carried out in the early 1990s and which is now in need of updating. Secondly, it is possible that parts of the existing infrastructure would not meet current design standards. As part of the current effort to develop a sustainable transport plan for Canberra it was necessary to take stock of the existing cycling and pedestrian infrastructure and to develop a new master plan to guide its improvement over the next 10 years.

This master planning study is being carried out in a way that is consistent with and which supports the relevant goals and strategies of the Sustainable Transport Plan (STP – April 2004). The aim of the STP is to achieve an efficient, effective, equitable, safe and sustainable transport system for Canberra. The principal objectives of the STP are to minimise the need for costly road infrastructure, increase public transport use, reduce greenhouse gases and local air emissions, increase personal physical activity from cycling and walking, make better use of existing infrastructure, reduce single occupant car travel and reduce traffic congestion.

The work covered in this report has been carried out between November 2003 and March 2004. Brown is the lead consultant and undertook most tasks in the study. Arup (Transportation Planning) of Melbourne provided specialist subconsultant input to address travel demand for cycling and pedestrian infrastructure.

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

3 SCOPE OF WORK

The scope of the master planning study is defined in the brief as follows:

- review existing cycling-related studies, plans and strategies;
- collect on-road cycling lane data on arterial roads including:
  - location of bicycle lanes that conform to Austroads Part 14 requirements;
  - location of bicycle lanes that do not confirm to Austroads Part 14 with description of non-compliance;
  - attributes, including width and location of directional signage (for cyclists only).
- enter all new cycle route data (collected by the project) into the ACTPLA GIS.
- examine the Roads ACT ACTRAMS database, information on file with Roads ACT and the Pedal Power Capital Works database (http://www.pedalpower.org.au/events/capworks/intro.htm) for deficiencies identified by the public;
- assess existing demand and anticipated demand for cycling infrastructure from new or planned developments, including the main growth scenario outlined in the Canberra Spatial Plan www.actpla.act.gov.au/ourcanberra.
- similar analysis to above for those sections of the trunk cycle paths which also serve as main pedestrian routes. Particularly those sections near urban centres and linking public transport interchanges and major trip generators;
- identify infrastructure deficiencies and gaps in the existing network and where necessary recommend new trunk routes to serve existing or anticipated demand. This should recognise that different facilities cater for different cyclist user groups and skill levels and include consideration for the use of quiet residential streets as alternatives for trunk arterial on-road cycle lanes as appropriate;
- identify significant opportunities and synergies. For example opportunities to upgrade the cycle path network in conjunction with future road construction or land use developments. This includes liaison with Roads ACT – Asset Maintenance, to identify synergies possible through future road resurfacing works planned as maintenance;
- develop a prioritised 10-year CW program, indicating priorities and timing;
- indicate costs and benefits for projects in the first 3 years (assuming $1 million per annum capital works budget).
- present the report findings and recommendations at a stakeholders meeting.

It should be noted that the scope of this study is limited to “trunk” routes using the path network and on-road cycle lanes only. Trunk routes, be they paths or on-road cycle lanes, are routes that primarily fulfil a

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

transport function, as distinct from use for leisure, recreational or other activities. A key user group of the trunk network is commuters, ie. people travelling between their homes and places of work or study. Commuters generally seek the shortest and most direct linkage between their origin and destination. Trunk routes are often characterised by higher travel volumes and longer trip lengths than other routes such as those that are more oriented to local neighbourhood use or recreation.

As off-road paths are available not only to cyclists but also to pedestrians, joggers, roller bladers and other users these are sometimes referred to as “community paths”. In this study, all references to paths in the ACT implies accessibility by all user groups. Of course “on-road” cycle lanes are, by definition, part of the roadway and intended for use by cyclists only.

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

4 BACKGROUND DATA

An initial task of the study was to assemble and review available background data relating to cycle and pedestrian planning and the path network in the ACT. In total some 45 reports and other documents were located. These were mainly reports produced and/or held by Roads ACT and ACTPLA. Additionally a further 12 electronic data sources were utilised in the study. The latter included census data from the Australian Bureau of Statistics and various GIS data from ACTPLA.

A full list of the identified background data is presented in **Appendix A.**

The first major cycle route constructed in the ACT has been reported (Ref 11, Gossip 1992) as being the Lyneham to Civic Cyclepath which was built in 1973. By 1992 this path was in need of improvement but was found by Gossip to be “very well used by a large number of people”, subject to a “steady stream of cyclists, joggers and walkers” and considered to be “a valuable asset to the community”. It is worth noting that North Canberra to Civic continues to be a very heavily travelled commuter cycling and walking corridor today.

One of the early wide scale investigations into the Canberra cycle path network was a 1975 study by the Department of Housing and Construction of the National Capital Development Commission (NCDC) (Dept Housing & Construction NCDC 1975). In addition to reviewing the principles and standards applicable to cycle path planning and design, the study investigated and recommended three significant cross town cycle routes. These were:

- Narrabundah to Telopea Park and across the Commonwealth Avenue bridge to City West
- Turner to Belconnen Town Centre, with a branch route to the University of Canberra
- Woden to City

The study reported an informal survey of four Woden Valley schools that “revealed that approximately 15-20% of school students may be expected to ride their bikes to school during fair weather through the winter months in Canberra”. It also stated that 20% of school children would use their cycles daily for an additional inter-neighbourhood trip, apart from their trip to school.

The ACT Cycling Strategy Plan (Arup, Geoplan & Feilman, June 1992) and associated reports (ACT Bicycle Policy Market Survey, Datacol July 1991; On Road Cycling in the ACT, Arup & Feilman Feb 1992) provide much detailed information about cycling, and particularly on-road cycling, in Canberra. Amongst others, the following observations were made from the survey about commuter cycling activity (in 1991):

- Around 40% (114,000 people) of the ACT population cycled regularly, ie. at least once a fortnight;
- A much higher percentage of bicycle trips were made for non-commuting purposes (79%) than commuting purposes (21%);

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

- Among regular riders over 14 years old, around 30,000 regularly commuted by bike to work or school, and on average around 20,000 did so daily;
- There were about 18,000 cyclists who commuted to work, with an average daily trip rate of about 12,000 cyclists. This equates to a bicycle mode share of 7%, although this estimate appeared high and a 5% mode share was considered more realistic;
- The major potential market for commuter cycling was amongst the people who were regular riders, but who didn't currently cycle to work. The survey identified a potential to increase the commuter cycling market by 30% or more;
- There was a much smaller potential for working non-riders to change to commuting by bicycle in the future;
- The potential market for commuter cycling included a significant number of commuters who currently walked or rode a bus to work;
- Generally cyclists tended to use off-road facilities for at least part of the trip, particularly for Education and Recreation trips, however greater use was made of the roads for the cycling journey to work;
- Generally, parking, shower and change room facilities were available at the work place. This indicated that most potential commuter cyclists were provided for at work, but that there was room for improvement.

Another bicycle survey (Ratcliffe 1993) undertook cordon counts around the main town centres and reported that "the work trip mode split (1991) is estimated to be between 2% and 6%", a very wide range and a high uncertainty. It is also noteworthy that female cyclists were consistently under represented in Paul Ratcliffe's data, with only one third of all surveyed cyclists (in 1992) being female. He also found that female participation was lowest for work and secondary school trips (18%) and highest for adult recreational trips (40%).

The main outputs of Arup et al's 1992 Cycling Strategy were 74 policy recommendations to develop and improve cycling in Canberra. These were categorised under the four activity streams of education, encouragement, engineering and enforcement.

The 1992 strategy also put forward a Proposed (On-road) Commuter Cycling Network which is shown in **Figure 1**. The network was developed using the following criteria to identify the primary route structure:

- Every suburb should be linked to its Town Centre via at least one reasonably direct arterial route.
- The town centres should also be directly linked to each other.
- The other major nodes of employment/study (i.e. commuter trip attractors) should also be linked.
- These links should be made in the most efficient manner, and this means that some routes, or sections of routes, perform a dual function.

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

- Where possible, even / flat grades and short distance links are favoured.
- Cross town on-road links are important.

The Arup team inspected the proposed commuter cycling routes and subsequently reported over 400km of road length in the 755 road segments recorded in the survey database.

Since the 1992 Cycling Strategy, provision for arterial cycling routes has become a standard component of land use planning in the ACT. For example, master planning for Gungahlin incorporated an overall master plan for an integrated cycleway trunk route system. This in turn provided a framework for development of detailed plans for a community path system in each neighbourhood (Arup, Feilman & Margules Groome Pöyry, Sept 1992).

It should be noted that since the 1992 strategies much of the then proposed network, particularly for on-road cycling, has now been completed. However, as noted later in this report, a substantial part of it does not comply with current design standards (eg; line markings are present, but not signs).

Over the last five or so years there has been a major effort to expand, improve and formalise planning for walking and cycling in the ACT. For example, the Canberra Bicycle 2000 Strategy provided a multi faceted approach which identified the overall direction to improve cycling in the six key areas of Safety, Education, Engineering, Environment, Enforcement and Encouragement.

In the context of current land use and transport planning in the ACT there are three recent policy documents that are particularly relevant to this study. At the national level, Austroads has published the "1999 – 2004 Australia Cycling, The National Strategy". This was prepared for the Commonwealth Department of Transport and Regional Services with input from a range of national stakeholders and key state agencies. The strategy sets out a vision, goal and several objectives for cycling across Australia. The over arching vision is "Increased cycling for transport and recreation to enhance the well being of all Australians". This vision is supported by the specific goal to "Double bicycle use by the year 2004" and six key objectives focussed on improving planning, facilities, safety and public awareness of and for cycling in Australia. While it is unlikely that the goal of doubling national cycle use between 1999 and 2004 has been achieved the strategy provides a useful framework that is relevant to planning for cycling in the ACT today.

Two other key policy documents that inform cycle planning in Canberra are "The Draft Sustainable Transport Plan for the ACT" (December 2003) and "The Canberra Spatial Plan" (March 2004). The latter document is the latest in a suite of three primary elements which together (along with an Economic White Paper and a Social Plan) constitute "The Canberra Plan", a framework for resolving long term issues affecting the future of Canberra.

One of the goals of the Spatial Plan is to retain ease of movement and facilitate good transport connections. Policy responses to support this goal include encouraging a mix of land uses to reduce the number and length of trips, encouraging physical activity by locating new residential developments within

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

walking distance of activity nodes, improving trunk and local cycling and walking infrastructure measures to encourage the community to make greater use of walking, cycling and public transport and orienting new green fields developments around these high quality sustainable transport modes.

The following specific targets are amongst the outcomes sought by the Spatial Plan:

- 20% of work trips by 2011 to be by walking, cycling and public transport, and
- 30% of work trips by 2026 by waling, cycling and public transport.

Other outcomes sought by the Spatial Plan are:

- Highly accessible city on foot, bicycle and with public transport, and
- Easy and quick to get around by private vehicle.

Greater use of sustainable transport modes is also a policy response to support achievement of the Air Quality objective set out in the Spatial Plan.

The Sustainable Transport Plan (STP – April 2004) is a strategic framework to guide the planning and development of transport in the ACT. The SPT is a component of the Spatial Plan and both are closely integrated to establish the spatial direction for Canberra over the next 30 years. The SPT includes an overview of key data and statistics about the territory's transport system along with detailed policies, goals and strategies setting out how the transport outcomes of the Spatial Plan are to be achieved.

Through the SPT Canberra aims to provide opportunities for greater use of walking and cycling including:

- updating and building onto the strategic direction of the Canberra 2000 Bicycle Strategy;
- identifying and developing safe routes for walking and cycling - an integrated network of community paths, including on-road and off-road cycling opportunities;
- mapping and communication of cycling and walking routes and facilities; encouraging the provision of bicycle parking spaces, lockers and related facilities;
- promoting walking and cycling in TravelSmart programs and Travel Access Plans for employers, schools, universities and other such institutions; and
- improving opportunities to combine cycling and walking trips with bus trips.

The SPT's detailed mode split targets for work journeys in the ACT are shown in the following table:

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Table 1 STP Targets: Percentage of trips by Walking, Cycling and Public Transport (JTW)

MODE	2001	2011	2026
Walking	4.1%	6%	7%
Cycling	2.3%	5%	7%
Public Transport	6.7%	9%	16%
TOTAL	**13.1%**	**20%**	**30%**

(Source: STP, Page ii)

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Figure 1: 1992 Trunk Cycle Routes (779 KB)

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

5 ON-ROAD CYCLE LANE SURVEY

5.1 Survey Objective

The objective of the survey was to collect on-road cycle lane data on all arterial roads within the ACT, and to classify the cycle lanes according to whether or not they complied with current design standards (Austroads Part 14 1999).

5.2 Survey Scope

A checklist was used to log the cycle lane and signage characteristics. The checklist included such things as street name, cycle lane width, sign and symbol spacing, speed limit, cycle sign type, hazards and a section for any relevant comments. A sample checklist sheet is included in Appendix B.

A webcam was also connected to the survey vehicle and video footage of all existing cycle lanes was recorded during the survey. GPS Photolink software was used to link the digital still photos and the GPS track log data.

Digital still photographs were also taken at selected locations/notable features.

5.3 Equipment and Software

The following equipment was used to carry out the survey:

Garmin GPSMAP 76S – Handheld GPS with external (car roof) antenna

Kodak EasyShare CX4230 Digital Camera – to record noteworthy features

Laptop computer and webcam

GPS Trackmaker Professional – Software for real time display and recording of GPS data, and initial data processing

GPS Photolink – Software to geo-reference digital still photos.

ARCGIS – Principal GIS software package

5.4 Data Collected

The following data was collected during the survey:

- Location of cycle lanes
- Cycle lane width categories ie 1.2-2.5m for 60km/hr, 1.8m-2.7m for 80km/hr and 2.0-3.0m for 100km/hr speed limits.
- Linemarking – frequency of bicycle pavement symbols, location of green pavement marking and intersecting street name

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

- Location and description of cyclist signage
- Location and type of hazards including potholes, damaged kerb, kerb clearances, overhead clearances.
- Cycle lane pavement condition (Percent Poor/Fair/Good/Excellent)

5.5 Data Format

The format of the GPS data and other specific requirements for the entry of data into the GIS system were reviewed by Brown's GIS analyst. Uniformity was a vital consideration in the collection of useful data. Each feature type was therefore given a unique tag (eg. all R7-1-4 'Cycle Lane' signs) to be used when recording the data. This was to ensure the data could be processed efficiently.

Each new cycle lane was given a descriptive name. The street name and direction were used to identify the cycle lanes eg Northbourne Avenue Northbound.

The data was collected using the AMG coordinate system and converted to ACT grid by Brown's GIS analyst.

5.6 Trial Survey

A trial survey of a few cycle lanes was carried out in order to test the surveying procedure, equipment, software and GPS data formats and to allow for fine tuning of the data collection procedure. Two surveyors did the work. One drove the vehicle whilst the other logged the cycle lane/sign location using the GPS unit, completed the checklist, took photos and made relevant notes. The vehicle pulled over intermittently in order to enable width measurements of cycle lanes and take additional photos.

The test survey data was collected and forwarded to Brown's GIS analyst for confirmation that the collected data was in the correct format and was able to be integrated into the ACTPLA/Roads ACT GIS systems.

5.7 Temporary Traffic Management Procedure

The survey vehicle only stopped and/or pulled over when it was safe to do so. When a closer inspection was required and there was no safe place to stop and temporarily park the vehicle, the vehicle proceeded to a safe location nearby, parked and investigations were carried out on foot. No survey work was carried out during peak traffic times.

5.8 Full Survey

Following confirmation from the trial surveys that the data format was suitable, the full scale survey was conducted in December 2003. The majority of the data logging was completed from inside the slow moving survey vehicle. Digital photos were taken of any relevant features and later correlated to the GPS coordinates

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

using timestamp software (GPS Photolink). The data and photos were periodically downloaded to a laptop computer onboard the survey vehicle to ensure no data was lost or overwritten. As with the test survey, the vehicle stopped intermittently during the survey to measure widths of lanes and observe significant features. At the end of each day, the information recorded on the laptop was be forwarded to Brown's GIS analyst for checking and processing.

5.9 Data Processing

The collected data was processed and submitted as files in MapInfo format ready for incorporation into ACTPLA's GIS system.

5.10 Compliance with AUSTROADS Standards

The individual sections of cycle lanes were examined to determine compliance with Austroads Part 14. The cycle lanes that did not conform to the standard, were then further investigated and subdivided into categories based on their deficiencies.

5.11 Survey Findings

A total of some 1,280km were travelled over six days in order to traverse all of ACT's 960km of arterial roads. Both sides of all the arterial roads were investigated for the presence of on-road cycle lanes. A total of 180.7 lane-km of on-road cycle lanes were found and surveyed.

Figure 2 shows the extent and location of all the cycle lanes and signs recorded as part of the survey. In the figure the existing cycle lanes have been grouped into three categories as defined in the following table.

5.12 Off Road Path Survey

A limited supplementary survey of selected off-road paths was part of the original brief for the study. However the off-road survey was deleted to conserve the budget after the on-road survey was extended beyond the originally planned scope. All information used in the existing off road paths came from data held in ACTPLA's GIS database.

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Compliance Categories Used in Figure 2

Category Description	Categories included from Table B2 (Appendix B)	Length (m)	% of Total
Complies with Austroads Part 14 (Occasional Sign Missing)	1, 2d	22,391	12
Substantially Complies with Austroads Part 14) (Symbols Present, Too Few Signs)	2a, 2b, 2c, 2g	72,038	40
Non Compliant with Austroads Part 14 (No Symbols, Too Few Signs or Too Narrow)	1(i), 2a(i), 2b(i), 2c(i), 2d(i), 2e, 2e(i), 2f, 2f(i), 2g(i)	86,295	48
	TOTAL	**180,724**	**100**

Additional detailed survey findings are presented in **Appendix B**. **Table B1** in Appendix B lists all of the 138 surveyed on-road cycle lane sections in the ACT along with their lengths and their compliance status. **Table B2** in Appendix B lists the compliance categories used in the survey.

The survey found that only approximately 5% of the 180.7 lane-km of surveyed on-road cycle lanes fully complied with Austroads Part 14. A further 1% of the lanes complied with respect to linemarking and signage but had a non-conforming width for the existing speed limit.

A large proportion of the cycle lanes (approximately 33%) fall into the single non-compliant category defined as “Symbols present – non compliant; Signs present – non compliant; Width – non compliant”.

The remaining 61% of the surveyed cycle lanes do not comply with Austroads Part 14 because they fail to satisfy at least one of the line marking, signage, or width criteria.

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Figure 2: 2003 Exisitng On-Road Cycle Routes (1,020 KB)

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

6 DEFICIENCIES IDENTIFIED BY THE PUBLIC

Both Roads ACT and Pedal Power maintain their own separate databases recording complaints/comments from the public on deficiencies in the ACT path network. These have been reviewed to identify issues relevant to the current study.

6.1 ACTRAMS Database (Roads ACT)

Roads ACT's "ACTRAMS" database records the date of the complaint, path location and extent of rectification works. The database also records how the complaints will be dealt with by Roads ACT. One way of dealing with a complaint is to list it on a separate register for future Capital Works for Paths. This listing is kept by Roads Act's Asset Creation and details the estimated cost and priority for dealing with each complaint. The priority system uses the following rankings:

1. high priority – meets ACTCODE criteria of 1,000 vehicles per day or ministerial direction
2. high priority – adjacent to medium density leases (ACTCODE criteria) and high pedestrian volumes, eg shops.
3. high priority - both side of the road for bus routes (ACTCODE criteria)
4. high safety risk – non standard paths including pram crossings
5. medium safety risk – access for the elderly, children at schools and the disabled
6. low safety risk – pedestrian/traffic conflict or high potential for slips and trips
7. continuity – worn paths in unpaved areas
8. others – not recommended for construction
9. construction completed

Comments/complaints with rankings of 1 to 5, and 7 and dated 1 January 2000 or later were reviewed as part of the study. Comments relating to maintenance work on existing paths were not considered.

A full summary of the comments/complaints is contained in **Appendix C**.

The majority of the comments/complaints relate to minor footpaths. The construction/upgrading of these paths would not contribute to the development of the 'trunk' network.

Table 2 summarises the comments/complaints considered relevant to this study. The table data has been sorted according to the above priority.

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Table 2: Comments/Complaints from Roads ACT "ACTRAMS" Database

DATE	PATH LOCATION	Roads ACT RANKING
14/3/00	Weston – Streeton Dr, path along southbound carriageway leading from road shoulder commencing at Streeton Dr through to existing path at Cotter Road in amongst the trees.	1
26/4/00	Page – Southern Cross Dr, southern side between Coulter Dr and Chewings St.	1
23/3/01	Campbell – Rosenthal St between Treloar Cres and Jackson St underpass.	1
30/4/01	Page – Southern Cross Dr, southern side, between Coulter Dr and Chewing St.	1
15/10/02	Melba – Kingsford Smith Drive between No. 175 and Bainton Crescent (east)	1
31/1/00	Barton – Sydney Ave Blk 3 Section 30	2
16/10/01	Latham, Ginninderra Drive/Florey Drive -on road cycling to Dunlop.	3
17/8/01	Woden/Civic cyclepath – requires a design review for southside cyclepaths. Roads ACT committed to 02/03 CWP bid	4
17/9/01	Fraser, cyclepath along Kuringa Drive	5

The majority of the above comments/complaints relate to minor footpaths. The construction of these paths would not contribute to the development of the 'trunk' network.

6.1.1 Comments/Complaints to Minister and Roads ACT

Roads ACT also processes comments and complaints relating to cyclepaths and footpaths which have been submitted to either the Minister for Urban Services or to Roads ACT itself. Each item of correspondence is held on file at Roads ACT and has been responded to individually. In the case of letters to the Minister they are responded to by a representative of the Minister. A summary of the issues

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

raised by this correspondence is included in **Appendix D**. Issues considered relevant to this study have been summarised in **Table 3.**

Table 3: Comments/Complaints to Minister and Roads ACT

DATE	ISSUE
25/9/03	Provide on road cycling on Kings Highway within the ACT.
21/3/03	Cycle path along Sulwood Drive between Tuggernong Parkway and Athllon Drive connecting existing off road cycle paths.
18/3/03	On road cycle lane from Wanniassa to Barton using Adelaide Avenue. No direct routes from Kambah to Civic or within the inner north suburbs.
27/2/03	Extend cyclepath from along Parkes Way where the city bound emergency lane ends before Commonwealth Ave Bridge through the tunnel.
4/2/03	Cycle path along Sulwood Drive between Tuggeranong Parkway and Athllon Drive connecting existing off road cycle paths.
16/1/03	Hackett to Parliamentary Triangle. No bike paths along direct route using Majura Avenue, Limestone Avenue, Anzac Parade to Kings Avenue Bridge. Require a cycle path to service the inner north (Watson, Downer, Dickson, Ainslie and Hackett).
25/11/02	Spence to City. Off road cycle path along Owen Dixon Drive (Evatt and Spence).
28/10/02	Cycle path along Owen Dixon Drive adjacent to Evatt and Spence.
8/3/02	Squeeze point on Fairbairn Avenue at overpass at Jackson Street. Construct new path from Rosenthal Stret along Fairbain Avenue as shown as proposed on Canberra Cycleways map
22/10/01	Construct off road path along Erindale Drive from Fadden to Isaacs.

6.2 Pedal Power

The Pedal Power website contains a members' comments database where cyclists can register suggestions for future Capital Works. The database was last updated in November 2003 and is grouped into six geographical areas namely Tuggeranong, Gungahlin, Woden/Weston, Belconnen, South

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Canberra and North Canberra. Each of the sections were reviewed and the relevant suggestions listed below. Again, suggestions relating to maintenance issues have been omitted.

6.2.1 North Canberra Section

Table 4: Pedal Power Database - North Canberra Section

Cycle lanes Mouat St- Lyneham- would connect existing lanes on Ginninderra Dve with planned lanes on Northbourne Ave.
Sealed Bike path across lowest point on Majura-Ainslie Ridge from Hackett to Majura Road- major short cut to future growing employment area in Majura Valley
Median bike path on Northbourne Ave
Bike path parallel to Fairbairn Ave from War Memorial to Airport
Kerb ramp at western end of Wendouree Drive (near Carillon) to allow access to bike path to Kings Ave
Seal current dirt path at Regatta Point, Commonwealth Park, from Commonwealth Ave to Nerang Pool- would allow cyclists quicker route avoiding hill, car-parks, road crossings and Floriade closures
Airport Bike path extending from existing path at Dairy Flat Rd along North bank of Molonglo river, passing underneath Dairy Flat Rd and Monaro Hwy at river bridges (ample existing space on river bank), then continuing along southern side of Pialligo Ave to cross just east of Ulinga Pl and continue into airport. Noted that Airport precinct is the only major employment area in Canberra (apart from Hume) not serviced by bike paths. Also when combined with other path improvements would create a city-to-airport bike path for visitors.
As above but continuing along riverbank to connect with Kallaroo Rd Pialligo as a recreational path
Linking path allowing eastbound cyclists on Fairbairn Ave/Pialligo Ave to connect into Nomad St, Pialligo
Bike path full length of Haig Park from Knibbs St Turner to Limestone Ave Braddon, connecting with trunk Path through Turner, and all north/south streets in Turner/Braddon heading into Civic West and Civic East

Upgrade pedestrian path on South side of Barry Drive by ANU between Clunies Ross Street and McCaughey Street, to connect paths along these streets with each other.
Upgrade various paths and fill missing gaps to create continuous cycle path along Sullivan's Creek through ANU campus. (ANU property)
Underpass beneath Barry Drive at Sullivans Creek to connect Watson St Turner path with proposed Sullivan's creek path above
East Ainslie bike path in nature reserve behind Duffy St, connecting existing trunk bike path near junction of Majura Ave and Phillip Ave Dickson, with Chisholm St, Ainslie Ave, and Trelour Crescent with connection s to proposed Fairbairn Avenue path.
Ainslie/ Watson bike path from existing trunk bike path near junction of Majura Ave and Phillip Ave Dickson, through Canberra Nature park behind Hackett, then along Stirling Avenue power line reserve, before turning south to connect to existing Watson path at junction with Flemington Rd
Bike path at current missing link adjacent to Wendouree Drive East at Hospice.
Re-mark Northbound carriageway of Federal Hwy at junction with Flemington Rd, Lyneham, to allow cycle lane to go through intersection. Can be done on existing road space.
Upgrade sub standard footpath Moat St to proper Austroads standard bike path
Construct new bike path alongside Moat St Eastbound, adjacent to Southwell Park, from Hockey Centre to Northbourne Avenue
Cycle lanes Northbourne Ave – will fit on existing road space without widening, but will need repairs to kerbing/guttering
Underpass beneath Parkes Way west of Russell roundabout, with bike path from Lakeshore path near Carillon to Defence HQ. To be jointly funded by ACT/NCA/Dept of Defence- has been on hold for some years due to lack of NCA funding.
Cyclist/pedestrian refuge in middle of Wakefield Ave at junction of Wakefield Ave/Dooring St. Braddon. Many cyclists cross Wakefield at this point but visibility is poor due to hill crest.
Link path (30M) between Wendouree Drive and lake shore bike path at Blundell's cottage

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Upgrade footpath on Limestone Ave to full cycle path standard
Cycle lanes on Limestone Ave- will fit within existing road width
Cycle path on Limestone Ave Median
Tourist/Commuter Lake-to-War-Memorial bike path via tunnel under Parkes Way at Commonwealth Park, along Constitution Ave and then via Anzac Parade memorials with link to St Johns Church, crossing to War Memorial at underpass or pedestrian crossing on Limestone Ave. Optional link paths to Anzac Park West for commuters. Noted that at present the War Memorial is the only major tourist attraction not served by ANY cycle paths.
Tourist/Commuter Lake-to-War-Memorial bike path via tunnel under Parkes Way at Wendouree Drive, along Constitution Ave and then via Anzac Parade memorials, crossing to War Memorial at underpass or pedestrian crossing on Fairbairn Ave. Optional link paths to Anzac Park East for commuters. Noted that at present the War Memorial is the only major tourist attraction not served by ANY cycle paths.
Cycle lanes Macarthur Ave- will fit on existing road space
Kings Avenue North of lake- on-road bike lanes from bridge to roundabout with kerb ramps to allow cyclists to transfer from path to road and vice versa
Bike path from Rosenthal St Campbell to Campbell Park Offices. This has been formally requested in PP submission 8/02 and detailed engineering study has been done on Fairbairn Ave section- however no funding allocated yet.
Replace at-grade bike path crossing of Northbourne Ave Dickson with underpass to save waiting time at lights for both cars and cyclists- could probably be justified economically on these grounds alone.
Cycle lanes on Majura Road: unlikely due to eventual long term plans for a separate Majura Parkway however some road widening due in summer of 2002/3
Cycle lanes on London Circuit
Cycle lane on Kings Ave southbound from Russell roundabout to bridge, with connecting ramp to bridge path

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Cycle lanes on Flemington Rd Lyneham between Federal Highway and where existing cycle lanes end at Randwick Rd- including to left of bus priority lane at junction with Federal Hwy- existing bike path does not work well due to heavy traffic at EPIC entrance on weekends, and need for northbound cyclists to cross Flemington Rd twice in short distance across continuous traffic. (This road a likely candidate for widening to 4 lanes, cycle lanes should be included as part of works)
Cyclist/Pedestrian Crossing on Officer Crescent, Ainslie, at junction with Majura Ave to allow Hackett and some Ainslie residents easy access to Dickson trunk bike path
Cyclist/pedestrian crossing on Phillip Avenue, Hackett, near junction with Majura Ave, with direct path connection along Majura Ave to end of Dickson trunk bike path
Kerb ramp on Aspinall St, Watson, allowing access to intersecting footpath 20m north of junction with Stirling Ave
On-road Cycle lanes on Wattle St Lyneham and David St Turner, between De Burgh and Forbes Sts
Northbourne Ave Service Road Downer, Southern end- close off connection to Antill St to prevent peak hour rat-running. This is a busy cycle route connecting bike path further north with Dickson group centre and bike path
New bike path about 2km long, from intersection of Flemington/Randwick Rds to intersection of Sandford/Hoskins Rds, Mitchell, passing behind buildings at southern end of Mitchell industrial area (with minor path links to employment centres on Sandford St)- would link existing paths that terminate at these locations to create new Gungahlin-Mitchell-Nth Canberra bike path route
10 metre extension of bike path at junction of Flemington Rd and Federal Highway, Mitchell, to allow direct connection between path and northbound cycle lane on Federal Hwy

6.2.2 South Canberra Section

Table 5: Pedal Power Database - South Canberra Section

Cycle lanes full length of State Circle- can be done by line marking only in some locations, others need widening.

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Scrub median cross hatch lines on Hopetoun Circuit at junction with slip lanes from/to Adelaide Avenue- These make traffic lanes unnecessarily narrow. Use currently wasted space as cycle lanes on edge of road.
Cycle path from junction of State Circle and Rhodes Pl (opposite South African High Commission) to connect with existing cycle path crossing Forster Cres, Yarralumla- see wear line on grass.
Link path connecting main Flynn Drive bike path with lake-side recreational path, at point where they come within a few metres of each other at north edge of Lennox Gardens
Link path to eliminate hairpin bend on bike path for cyclists using lakeshore path who then want to access Commonwealth Bridge. Note NCA have refused to construct this for aesthetic reasons.
Cycle lanes State Circle Flynn Dve to Adelaide Ave Only- can be done without widening.
Bike path adjacent to Parkes Place needs bollards or similar to prevent cars parking with fronts protruding over bike path.
Kerb ramps needed at both ends and centre of Parkes Pl near lake to allow cycle access to/from adjacent bike path
Linking path from Adelaide Ave eastbound to bike path at junction Novar St/Dudley St Yarralumla (app. 100M) Deakin. Cyclists currently push bikes up grass slope.
Link path (150M) between Jerrabomberra Ave south end and Monaro Hwy Northbound cycle lane- possible crossing of Monaro Hwy median strip to also connect with southbound lanes. Would provide short cut and avoid dangers on Hindmarsh Drive. Opposed by Roads ACT on grounds that it would lead cyclists to illegally ride south in nthbound lane- PP regards this risk as minor compared with cyclists making right turns across Hindmarsh drive. Currently at stalemate. Current cyclist numbers could not justify underpass.
Rebuild Junction of Carruthers St to eliminate dangerous continuing eastbound left lane becoming compulsory exit into Denison St, with cyclists currently forced to move right into squeeze point created by Denison St median jutting into Carruthers St.
Cycle lanes on Telopea Park and Manuka Circle (widespread comment from contributors of this suggestion regarding low standard of Telopea Park bike path).
Replace worn out and meandering Telopea Park bike path with new, more direct path alongside

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Telopea Park Rd East
Replace 2 narrow sub-standard bridges on Telopea Park bike path across culvert drain with single modern bridge
Cycle lanes on Captain Cook Crescent- will fit on existing road space
Upgrade shoulders (esp westbound) on Canberra Avenue from Newcastle St to NSW border to proper on-road cycling standard
Bike path on Captain Cook Crescent Nature Strip
Remove squeeze points, Dalrymple St Red Hill
Cycle lanes on Capital Circle- northbound
Replace Bowen Drive crossing with ramp from Kings Ave Bridge Northbound direct to lakeshore. Unlikely to be built due to NCA plans to close Bowen Drive by 2005.
Kerb ramp from footpath alongside Langton Crescent onto road, to allow northbound cyclists to get off bridge and transfer to road before King Edward Tce intersection.
Bike Path on Melbourne Ave median, with path connections north to Federal Parliament and south to Red Hill nature reserve
Foreshore Bike path from Bowen Park to Jerrabomberra Wetlands: PP is currently trying to get best possible route for cyclists through Kingston foreshore project
Commuter bike path through Jerrabomberra Wetlands from Newcastle St Kingston to Dairy Flat Rd
Bike path between Ipswich St and Whyalla St Fyshwick, placed between service road and Canberra Ave proper.
Bike path connecting existing Jerrabomberra wetlands path with Newcastle St Fyshwick
Bike path alongside Ipswich St Fyshwick connecting above with Canberra Ave path
Reconstruct bike path ramp from Flynn Drive to Commonwealth Bridge (west side) to provide easier gradients, better sight lines and also to connect to recreational path on lakeshore.

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

4 Kerb ramps required on footpath on Hobart Ave, Forrest, where 2 driveways enter Forrest Primary School across footpath
Kerb ramp on Hobart Ave, Forrest, where existing footpath crosses Hobart Ave to Somers Cres
Cyclist/pedestrian crossing on Novar St, Deakin near Denison St, to connect Deakin trunk bike path to connecting link path to Newdegate St
Cycle lane on Adelaide Ave Southbound off-ramp to Novar St Deakin. Would allow cyclists to easily pass large peak hour build up of cars queuing against kerb.
Link path (about 50m) from Adelaide Avenue southbound cycle lane to footpath on Nathan St Deakin

6.2.3 Belconnen Section

Table 6: Pedal Power - Belconnen Section

Bike Path alongside College Street Bruce, between Eastern Valley Way and Haydon Drive
Bike path along Kuringa Drive and Barton Hwy connecting Fraser main path near Somerville St with Curban Drive path and Federation square, with crossing at junction of Kuringa Drive and Barton Hwy.
Adapt existing equestrian underpass on William Hovell Drive near Caswell Drive to dual purpose facility allowing cyclist access between William Hovell westbound and bike path on north side of William Hovell
Short Linking path between Belconnen Way bike path and fruit/veg markets
Bike path from existing Ginninderra Drive underpass, Kaleen, to existing Maribyrong St underpass, Kaleen, passing south of Shannon Circuit and then north along drain, with minor connecting paths to Shannon Circuit and Pambula St. To allow by-pass of Alberga St and Shannon Circuit
Bike path along Eastern Valley Way and Cameron/Chan Sts from Lake Ginninderra eastern shore to Benjamin/Cameron office precinct, to provide safe route through Belconnen TC for cyclists in North Belconnen and Gungahlin
Bike path on western side and adjacent to Owen Dixon Drive

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

On road cycle lanes Belconnen Way/Barry Drive.
Upgrade and fill missing gaps in sealed shoulders on Ginninderra Drive to create continuous cycle lanes
Install cycle/ped crossing on Haydon Drive where bike path crosses at Purdie St
Bike path along eastern bank of Lake Ginninderra, Lawson, connecting existing lakeside paths north of Baldwin Drive and South of Ginninderra Drive beneath existing bridges over lake.- should be built as part of Lawson development
On-road Cycle lanes on Maribryong St Kaleen

6.2.4 Woden/Weston Creek Section

Table 7: Pedal Power - Woden/Weston Creek Section

Bike path from Woden trunk path (via above underpass) to connect with existing westbound path near junction of Gordon and Webster Sts- would allow Hughes to be easily linked to Woden TC
Install/upgrade cycle lanes full length of Kent St, with works to eliminate squeeze points and modify cyclist-hostile traffic calming measures
Replace dangerously sited refuse trap in Yarralumla Creek at McCulloch St causes bike path to flood whenever there is heavy rain and causes damage and silting problems to path. This should be a stormwater rather than cycle infrastructure cost. However, if a new one is to be built, it should be placed just upstream of Cotter Rd and a bike path bridge placed on top of it to allow cyclists to by-pass current convoluted arrangement at Cotter Rd
Kerb ramps on footpath on eastern side of Melrose drive Phillip, at junctions with Corinna ST and Morgan St. Currently no means of getting across these junctions for disabled, difficult for cyclists
Place cycle lanes on Dixon Dr Holder, by re-allocating large area of wasted space painted as medians in middle of road.
Cycle lanes on Hindmarsh Drive in Woden/Weston Creek - on most of length will fit on existing road space by re-marking lines

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

On-road cycle lanes full length of Launceston St Philip/Lyons. In Philip would require road widening or reduction to two general traffic lanes + bike lane
Cycle path connecting Tamar St Red Hill with Curlewis Crescent Garran, taking easiest possible gradient over Red Hill/Mount Mugga Mugga ridge alongside Hindmarsh Drive
Upgrade/connect/ add to shoulders on Hindmarsh Drive from Yamba Drive to Mugga Lane to create full on-road cycle lanes
Link Path Launceston St Philip to Conyers St Hughes
Underpass beneath Hindmarsh Drive on Red Hill/ Mount Mugga Mugga ridge allowing easy MTB continuation along ridge.
Cycle lanes on Cotter Rd from Streeton Drive to Mount Stromlo turn-off- busy road with many recreational riders/drivers on weekends
Bike path along Cotter Rd from Tuggeranong Pkwy to Dudley St Yarralumla

6.2.5 Gungahlin Section

Table 8: Pedal Power - Gungahlin Section

Bike path Mirrabrie Drive Amaroo to Anglis Close Nicholls following northern tributary of Ginninderra Creek downstream to Gungahlin Pond. Currently private land (golf course) but should be noted for future public ownership or as development conditions.
Bike path Yarrabi Pond Amaroo to existing bike path at Gungahlin Pond near Ibis St. Currently private land (golf course) but should be noted for future public ownership or as development conditions.
Work to fix numerous minor discontinuities on Gungahlin Dve cycle lanes. Roads ACT has investigated and will be fixing- low priority where good bike path is alongside rd in same direction.
Link ramp between Gungahlin Dve bike path and Gungahlin Dve northbound at southern end of Palmerston, to allow northbound path cyclists to switch to road to avoid hilly path and annoying pedestrian crossings at Kosciusko Ave.

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Reseal shoulders of Flemington Rd with smooth tarmac from Mitchell to Gungahlin
Bike path connecting Koskiusko Ave through Gungahlin TC to connect directly with on-road cycle lanes on Flemington Rd
Extend bike lanes on Flemington Rd all the way to Gungahlin Town Centre
Linking bike path between Barunga St Ngunnawal, and Wanderer St Amaroo, via existing underpass beneath Mirrabell Drive, connecting with bike paths alongside Mirrabell Drive- a short cut to Gungahlin Town Centre that would avoid some hills
Mirrabell Drive bike path northern end in Ngunnawal, (just south of Wangeneen Ave) where path loops underneath road- kerb ramp required to allow cyclists heading north on path to transfer to road

6.2.6 Tuggeranong Section

Table 9: Pedal Power - Tuggeranong Section

Cycle lanes on Athllon Dve from Drakeford Dve to Anketell St- particularly southbound
Works to eliminate dangerous squeeze point in Tharwa Drive, immediately south of Lanyon Marketplace
Mark Cross Hatching and Keep Clear Symbols where bike paths cross roads at Athllon/Sulwood Dve Roundabout
Traffic light crossing on Sulwood Drive near Athllon Drive where Tuggeranong to Woden bike path crosses
Underpass beneath Sulwood Drive near Athllon Drive where Tuggeranong to Woden bike path crosses
Redesign intersection Drakeford Drive/Barr Smith Avenue Bonython to eliminate dangerous line of-sight problems
Paint additional bike logo markings on sealed shoulder, Monaro hwy southbound Hume to Isabella Dve

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Construct missing section (about 700m) of bike path along west side of Athllon Drive
On Road Cycle lanes on-Point Hut-Tharwa-Lanyon- Circuit

Each of the above suggestions was considered and combined with to the suggestions received at the public consultation sessions. The comments and suggestions were assessed to determine whether they would satisfy the 'Trunk Route' criteria (See Section 9.4) if constructed. Suggested missing links were identified and also assessed to determine if their construction would add to the 'Trunk' network. Any duplication of suggestions was noted as this gave weight to these routes being flagged as 'high demand'. Some suggestions were disregarded if they would require detailed investigations at specific locations which would need to be examined through separate feasibility studies which would be beyond the scope of this strategic plan.

The Pedal Power website also lists what it describes as "Canberra's Top 13 Missing Cycle Links". These links have been reviewed and considered when preparing this Trunk Network Master Plan. The items are essentially the same as those mentioned in Pedal Power's initial submission to this study, the text of which is reproduced in **Appendix E**.

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

7 CYCLING AND PEDESTRIAN TRAVEL DEMAND

7.1 Cycling and Pedestrian Demand in 2001

The assessment of cycling and pedestrian demand on the trunk cycle network has been undertaken by a specialist transportation planning subconsultant, ARUP Transport Planning of Melbourne. The analysis is based on available information supplied by others and further transportation surveys were not undertaken. The purpose of the assessment was to forecast desire lines between major origins and destinations for cycling and walking trips as a basis for developing the ACT Trunk Network Cycling Master Plan. Given the lack of survey data, this could only be carried out at a coarse level utilising historic data and applying growth assumptions. There was particular concern was the lack of information on pedestrian traffic on which to base the forecasts.

The Trunk Cycling Network as broadly defined in the brief is “high demand and expected/ planned high demand”. Given that further definition of “Trunk Cycling Network” was not provided in the brief some judgement has been used to identify demand.

The data sources used for the assessment were as follows:

- The Journey to Work (JTW) results of the 2001 census was the primary source for determining the number of commuting (to work) cyclists in the ACT, and their origins and destinations. Note that the JTW data is for one way trips from home to work only and does not include the return journeys from work to home.
- Some broad findings of the 1991 market survey of 1,009 Canberra households were also used to assess non-commuter trips [1]
- Spot counts of usage levels by cyclists on key routes throughout the ACT collected between 1991 and 1993/94 as summarised in the “Trends, Variations, Survey Results, Helmet Wearing and Cyclists’ Characteristics: 1991 – 1993/94” report prepared by ACT Department of Urban Services.

Figure 3 summarises the estimated major cycle demand lines in the ACT as at 2001. This analysis was primarily based on the cycle to work trips taken from the 2001 census JTW data, as this was the only recent dataset available that could be used to forecast origin and destination patterns. The detailed data matrix is included in **Appendix I**. The 1991 market survey was used to estimate non-JTW cycling trips; i.e. cycle to the shops and cycle to school/ education. Journey to work data provides one-way trip information. The demand analysis shown in the following figures therefore shows one-way cycle and walking trip rates only. The assumptions are discussed below.

[1] Arup Transportation Planning (June 1992), *ACT Cycling Strategy Plan;* pp.E.3 - E.4.

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Figure 3: Cycle Demand 2001 by Suburb (288 KB)

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

The 1991 market survey found that 40 per cent of the Canberra population cycled frequently. To qualify as a regular cyclist however, residents had to cycle at least once per fortnight. It is therefore conceivable that a resident may only cycle for any of the purposes once in a fortnight. Of those 40 per cent that cycled:

- 19 per cent cycled to work
- 21 per cent cycled to school
- 55 per cent cycled to the shop
- 75 per cent cycled for recreation.

Clearly, cycling trips to work represent the smallest, but most consistent and predictable, portion of trip purposes based on the results of the 1991 market survey. Although cycling trips for recreation and shopping represent by far the largest proportion of trips generated, the frequency of these trips are likely to be much lower than that of trips to work and to school. The market survey found that the "fortnight trip frequency varies significantly for different trip purposes, with a much higher frequency amongst cyclists who commute (ride to work or school) than those who cycle for recreation or shopping" [2].

Trips to schools are difficult to determine accurately without the benefit of school enrolments and other detailed data such as the number of students that cycle to school and where they live. These trips however, are expected to be short, within suburbs and are more likely to use local streets than main trunk routes. Many factors affect whether or not a student will ride to school such as traffic around the vicinity of the school and along their travel path, weather, provision of end of trip facilities such as bicycle racks and whether the school encourages cycling as a mode of transport.

Trips for shopping are expected to also be short and utilise local streets within suburbs. They are generally infrequent. Trips for recreation can range from visiting friends, to sporting venues or for competition. They are the hardest group to classify and can vary from very short to quite long trips and can use local streets to main on-road routes to main off-road paths. Trips for recreation are also inconsistent adding to the difficulty in analysing them. The majority of these trips generally occur during weekends.

To incorporate some assessment of non-work cycling trips, both the JTW data and survey findings were used. The cycling trips recorded from the 2001 census were factored by the relevant proportions noted in the market survey findings. To account for the fact that the frequency of cycling trips to school and to shopping is likely to be less than once per day and less for shopping trips than school trips, it was assumed that on any given day:

- 60 per cent of the 21 per cent cycled to school

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

- 20 per cent of the 55 per cent cycled to the shops.

For example, 15 cycling trips originated from Acton in the 2001 census. Therefore, the number of trips to schools and shops within Acton was calculated by estimating trips for non-work purposes as follows:

15 x [(60% x 21) + (20% x 55)]/ 19 = 19 trips

These trips to school and shops were assumed to be local as described above and thus within suburbs. It is clear that the number of trips within suburbs (represented largely by trips to school and shops) is significantly greater than inter-suburb trips (represented by trips to work).

Recreational cycling trips are not represented in this analysis. This is due to the difficulty in categorising them and limited information known regarding them. Recreational cycling trips normally occur on weekends and very infrequently for such purposes as visiting friends, to sporting venues and for fitness. It is fair to suggest that local recreational trips would be undertaken on the same local path network used by cyclists commuting to schools and shops. Similarly, trips for fitness or competition would be done using the on-road paths/ trunk routes used by commuters to work. These paths are free of cyclists heading to work and school on the weekends and are thus available for recreational cyclists to use. For these reasons, trip generation of recreational cyclists have not been analysed separately in relation to trunk routes.

Figure 4 shows the pedestrian trips that coincide with the higher cycling trips demand shown in **Figure 3.** The single source of pedestrian trip numbers was from JTW tables and this information is summarised in **Figure 4.**

7.2 Correlation with Surveyed data

As indicated in Section 7.1 of this report, spot counts of usage levels by cyclists on key routes throughout the ACT were collected between 1991 and 1993/94 [3]. These spot counts are also used as a basis to identify if there are any constant correlation factors between JTW and actual counts.

---

[2] ibid; pp.E.4
3 ACT Department of Urban Services (Sept 1994, Trends, Variations, Survey Results, Helmet Wearing and Cyclists' Characteristics: 1991 – 1993/94.

Figure 4: Pedestrian Demand 2001 (239 KB)

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

The top ten daily bicycle use sites, taken from the above report, are shown in the table below:

Location	Site	Max Average daily Flow 1993/94 weekday
A	South Canberra	740
B	Belconnen	540
C	North Canberra	505
D	South Canberra	380
E	Belconnen	378
F	Woden	330
G	Belconnen	296
H	Woden	264
I	Woden	256
J	Belconnen	256

These sites are referenced on **Figure 10.** Trips recorded from 2001 JTW data are shown in the following table and compared where possible to the spot count data. This has been done at a town/district level eg. Belconnen (rather than at the suburb level eg. Florey), since the JTW data and spot counts are not directly comparable. The JTW data does not detail the path taken by commuters cycling to work, but rather their origins and destinations at a suburb level. The spot counts were actual survey numbers of cyclists traversing a given path in ACT. Therefore, in order to enable a comparison, the JTW data was grouped to a town/district level to determine the demand lines. The results are shown in **Figure 5**. Arup has subsequently made some assumptions regarding the paths taken by commuters represented in the JTW data. These assumptions are based on main road linkages to existing trunk routes. For instance, the number of linkages across and around Lake Burley Griffin are limited and therefore a high proportion of trips between the north and south side of the lake were assigned to Commonwealth Avenue. Similar assumptions were made on other routes throughout the ACT.

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Figure 5: Cycle Demand by Town (477 KB)

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

The results are shown in the table below.

Location	Site	Max Average daily Flow 1993/94 weekday	Approx 2001 JTW two-way flow grouped by LGA
A	South Canberra	740	516
B	Belconnen	540	644
C	North Canberra	505	264
D	South Canberra	380	72
E	Belconnen	378	206
F	Woden	330	538
G	Belconnen	296	274
H	Woden	264	444
I	Woden	256	114
J	Belconnen	256	274

This macro analysis provides a basis to compare the JTW data against actual surveys and therefore to validate the base data used in this forecast. The 10 most frequently used bicycle paths in ACT as of 1993/94 have some correlation with the JTW results from the 2001 census. The comparison of JTW data and survey counts reflects relatively good correlation with 40 per cent of sites. Other sites reflect variations of ±50%, which could well be due to factors relating to assumptions made on trip distributions to nominated locations. Small differences in the survey counts and grouping of the JTW data could also be attributed to a number of criteria such as:

- increases in population over the 1993/94 to 2001
- increases in popularity of the car as the preferred mode of transport over the period
- changes in employment densities
- effect of weather on the day of the census and the bicycle counts

Given the assumptions in assigning JTW trips to particular paths, the results of the above comparative analysis provide reasonably support to the JTW data and, therefore, the base data used in our analysis.

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

7.3 Estimated Cycling and Pedestrian Demand at 2013

A gravity model was used to assess the future cycling demand by predicting the increases in cycling trips in ACT based on population and job forecasts. The results of the cycling demand assessment are shown in **Figure 6**.

The equation used in gravity model is as follows:

$$T_1 = \frac{k \times P_a \times J_b}{d_2\ (a\text{-}b)}$$

where; T_1 = number Trips in time period 1

k = constant

P_a = population in suburb A (origin)
J_b = number of jobs in suburb B (destination)
d = distance between suburbs A and B

Since the population and numbers of jobs in each suburb were known at 2001, the distance could be determined between each suburb and the numbers of cycle trips are known at 2001 from JTW, the constant 'k' could be determined. Using this 'k' value with the estimates of populations and jobs growth in each suburb for 2013 as provided by ACTPLA, the cycling trips between and within each suburb for work purposes could be estimated. A similar analysis using the proportions of work trips versus trips to school and shops were applied to these numbers and the results are shown in **Figure 6**.

It should be noted that in Australia the demand for trips less than 2 km or 5 minutes in length may be somewhat less than predicted by this type of model. However these shorter trips are predominantly intra-, rather than inter-suburb in nature and are thus generally outside the definition of "trunk" trips adopted in this study, although short trips may still be considered as "trunk" where they are part of high volume demand in town centres.

Figure 7 shows the estimated pedestrian trips that coincide with the cycling trips to work demand identified in **Figure 6** in line with the previous discussion. The detailed data matrix is included in **Appendix I.**

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Figure 6: Projected Cycle Demand 2013 (299 KB)

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Figure 7: Projected Pedestrian Demand 2013 (232 KB)

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

It is clear from the analysis that intra-suburb trips represent by far the largest source of cycling trips in 2013. This correlates with general intentions of the Draft Canberra Spatial Plan (3 November 2003) to intensify residential and commercial development around existing urban town and commercial centres respectively to reduce the need for additional infrastructure and to minimise the length of journey to work or to education facilities. This will call for special attention to the provision of "end of trip facilities for cyclists in new developments such as bicycle parking, showers etc.

7.4 Future Mode Split

It should be noted that the above analysis assumes that the proportion of commuters travelling to work by bicycle in 2013 will remain approximately the same as it was in 2001 ie. about 2%. However ACT's transportation and planning policies are aimed at significantly increasing the non-car share of work trips in future years. If current targets are achieved and cycling increases to reach a 6% mode share then the 2013 inter- and intra-suburb cycling demand will be as indicated in **Figure 8** and **Figure 9** respectively (ie. Based on a pro-rata increase in cycle trip numbers by a factor of three (6/2)).

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Figure 8: Projected Inter-Suburb Cycle Demand 2013 (Assuming 6% Mode Split) (301 KB)

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Figure 9: Projected Intra-Suburb Cycle Demand 2013 (Assuming 6% Mode Split) (275 KB)

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Figure 10: Cyclist Spot Count Sites 1991-94 (384 KB)

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

8 STAKEHOLDER CONSULTATION

As part of the participative consultative process for this project, four, two hour, public information sessions were held. The key objective of these sessions was to identify "missing links" and other deficiencies in the trunk on- and off-road path and cycle lane network. The sessions were held at the following locations in order to attract comments from a wide cross section of the community:

GUNGAHLIN / NORTH CANBERRA AREA

Majura Community Hall

Monday 9 February 2004

SOUTH CANBERRA / WESTON CREEK / WODEN AREA

Southern Cross Club

Tuesday 10 February 2004

TUGGERANONG AREA

Tuggeranong Art Centre

Wednesday 11 February 2004

BELCONNEN AREA

Kaleen Community Hall

Monday 16 February 2004

The sessions were conducted by Brown with representatives from ACT Planning and Land Authority (ACTPLA) and Roads ACT in attendance to field questions. The sessions were conducted informally with information on the existing network, travel demand analysis and future Capital Works Projects being displayed for the public to view at their leisure. Attendees were invited to advise on any missing links or deficiencies in the path network by sketching them on a large scale (1:20,000) plan of the existing ACT path network. A new plan was used for each session.

Every attendee was also provided with a comments/feedback sheet which contained a scaled down plan of the cycle network, an area for comments and submission details. The feedback sheets could be

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

completed and submitted on the night or forwarded to Brown or Roads ACT within a week of the final session.

As well as holding the public information sessions, Brown also contacted several key stakeholders within the ACT including Pedal Power, Environment ACT, Heart Foundation, Australian Federal Police, Conservation Council, NRMA, ACT Cycling Federation, ACT Cycle Traders Association and several ACT Government Departments. The stakeholders were invited to attend the upcoming information sessions, meet with Brown, ACTPLA and Roads ACT and/or submit a written submission.

Over one hundred people attended at least one of the sessions with over 400 comments/suggestions being received from the sessions or via the comments sheets. Several independent submissions were also received.

A table in **Appendix F** summarises the comments received. Reduced copies of the sketch plans from the information sessions are also enclosed in Appendix F.

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

9 PROPOSED TRUNK NETWORK

The assembled background data, existing databases, public submissions and travel demand analyses were reviewed to inform the process of identifying and refining a proposed trunk cycle and pedestrian route network for the ACT. Amongst these data sources, the general public submissions, the submission from Pedal Power and the consultant's travel demand analysis were particularly relevant to this task. The most relevant information from these three sources is summarised below. It should be noted that virtually all the submissions related exclusively to cycling and there was very little explicit reference made to walking as a travel mode.

9.1 Public Submissions

There was a broad support for the following routes to be part of the trunk network and/or to be given high priority to remedy existing deficiencies and provide continuity for cyclists:

- Cotter Road eastwards from Streeton Drive (Weston) towards Capital Hill
- Woden to Civic route (including an easier means of crossing the Melrose/Yamba/Yarra Glen roundabout)
- Hindmarsh Drive (from Weston to Fyshwick)
- Barton Highway/Ellenborough/Moaut (from Hall to Lyneham)
- Kings Avenue bridge, from Parkes to Russell and Campbell offices
- NE Canberra to Civic corridor (Watson, Dickson, Ainslie, Braddon, Civic)
- Ginninderra Drive
- Belconnen Way/Barry Drive to Civic
- Tuggeranong to Civic (Erindale/Yamba/Yarra Glen/Adelaide/Commonwealth Ave)
- Kuringa Drive (Kingsford Smith to Barton Highway)
- Parkes to Fyshwick (via Wentworth/Commonwealth)
- Airport to Barton/Kingston (via Jerrabomberra wetlands)
- Flemington Road (Mitchell/EPIC/Federal Highway)

The above list shows the mostly frequently mentioned routes in comments received from the general public at the project information sessions and through submissions to the project team. It should be noted that over 420 individuals commented on the project. This submissions were summarised by grouping them geographically according to the road or route referred to. This resulted in 203 routes that were commented upon. Only 37 routes were commented upon in 3 or more submissions. The above list represents routes commented upon in 5 or more submissions.

9.2 Pedal Power Submission

Pedal Power is a non government organisation formed in 1974 as a rallying point for cyclists in the ACT and Queanbeyan region and to represent the interests of cyclists in Canberra. Pedal Power made an 11 page submission accompanied by a map of its own proposals for the trunk network. It also nominated a list of the "Top 12 Missing Cycle Links" of recommended priority works. These include works located on many of the routes highlighted in the public submissions and also city wide improvements such as a comprehensive system of destination signage for cyclists.

The submission (the text of which is reproduced in full in **Appendix E**) requests that the designated trunk network should include:

- Routes directly connecting major destinations that are within about 10kms of each other (eg. Belconnen to Civic)
- All cycle paths within approximately 3km radius of a major destination (or within 5km of Civic)
- Completing a route around Lake Burley Griffin (via Jerrabomberra wetlands)
- Improved routes through and between the inner north and inner south utilising quiet streets parallel to major roads as much as possible
- Symonston/Fyshwick to Garran, parallel to Hindmarsh Drive
- Upgrade existing Sullivan's Creek cycle path with lighting (ANU to Dickson)

9.3 Travel Demand Analysis

As described elsewhere in this report an analysis was carried out of likely future travel demand (by cyclists and pedestrians) based on available information which included the latest census Journey to Work data and projections of future land use. For the trunk network we have considered only the inter, and not intra-, suburb travel. The heaviest travel demand, based on 25 or more journey to work trips in the 2013 horizon year assuming the 2001 cycle mode share, is forecast to be between the following origin and destination suburb pairs:

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

From	To	Cycle Trips
O'Connor	Acton	74
Ainslie	Acton	38
Lyneham	Acton	36
Kingston	City	36
O'Connor	City	35
Turner	City	34
Downer	Acton	32
Turner	Acton	29
Ainslie	City	29
Lyneham	City	29
Kambah	Greenway	29

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

It can be seen that Acton (which includes the ANU) and Civic (City) are destinations for high volumes of cyclists. Considering trips originating in all suburbs, the following are the twelve highest destinations for cyclists (2013):

Destination Suburb	Total Cycle Trips
City	518
Acton	419
Belconnen	239
Barton	219
Gungahlin	181
Phillip	167
Bruce	161
Greenway	161
Parkes	158
Braddon	68
Dickson	65
Russell	62

As would be expected, the major trip destinations include the City centre (Civic), the universities (ANU in Acton and U of C in Bruce) and the main town centres (Belconnen, Gungahlin, Greenway – Tuggeranong, Phillip - Woden).

9.4 Trunk Route Criteria

Cyclists generally may be considered as falling into several groups according to their skill and comfort levels while cycling and the purpose of their cycle trips. VicRoads (Cycle Notes No. 7, VicRoads, August 2000) identifies Children, Family Groups, Recreational Cyclists, Commuters and Trainers, in that order, as five sub groups that possess increasing levels of cycling skill and experience and who are correspondingly better able to deal with high stress cycling environments. Less experienced cyclists, such as children, family groups and recreational users generally ride for pleasure and recreation. They tend to avoid busy roads and prefer off-road paths and quiet streets on which they have a more

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

predictable cycling environment and can avoid or minimise potentially risky and uncomfortable interactions with motorised traffic.

However commuter and training cyclists are usually more experienced and competent and generally want to cycle as fast as practical on the shortest and most direct route that serves their purpose. These cyclists are comfortable using busy roads when it suits their trip objective. On-road cycle lanes on arterial roads tend to be used mainly by experienced cyclists whereas off-road paths and quiet streets are used proportionally more by families, recreational cyclists and less experienced commuters.

This strategic planning study is focussed on cycling and walking as a means of transport and is therefore primarily concerned with commuter cyclists and pedestrians who will be the principal users of the trunk route network, even though non-work trip purposes (e.g. travel to shops, entertainment etc) does form part of the cycling/walking as transport task. However, it must also be recognised that there are likely to be significant numbers of commuters who will use off-road paths and quiet streets for parts of their commuting trips. For this reason it is desirable, where practical, to include off road paths and quiet streets in the trunk route network. These sections can provide alternatives to on-road cycle routes and offer a more pleasant, lower stress option to less experienced riders while still fulfilling their need for fast, convenient higher speed travel.

The following criteria have been adopted in defining a trunk route network for the ACT:

- The town centres and major origins/destinations (eg. universities, employment centres) should be directly linked to each other
- Many cyclists are not comfortable using arterial roads and for them off road paths or quiet streets may be preferred.
- Recognising the diversity of skill and comfort levels of cyclists it is desirable to provide a choice of both on-road and off-road routes where practicable, at least in the more heavily used corridors
- Existing facilities (on-road cycle lanes and off-road paths) should be utilised for the trunk routes as much as possible
- Where possible, flat grades and shorter routes are preferred
- Continuity of route, reasonable priority for cycle movements and minimising at-grade crossings of busy roads are preferred

9.5 Trunk Route Standards

To be designated as a ‘Trunk Route’ the cycle lane or path must meet certain requirements as outlined in Austroads Part 14. The requirements for the proposed on-road cycle lanes include (but are not limited to) the following:

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

- Desirable lane widths of 1.5m, 2.0m and 2.5m for 60km/hr, 80km/hr and 100km/hr roads speeds respectively
- Bicycle stencils at intersections and maximum 200m intervals
- Bicycle signs at the start and end of lanes and at maximum 500m intervals
- 100mm wide white unbroken line separating the cyclist from the traffic
- Lighting in accordance with Austroads Part 12 – Roadway Lighting.

All off-road paths in the ACT are designated as shared paths. In accordance with Austroads Part 14 1999 the requirements for the proposed off-road shared paths include (but are not limited to) the following:

- Desirable minimum path width of 2.5m
- Guide signs at the following locations:
  - path/path junctions and path/road junctions advising of key destinations, distances to destinations and intersecting road names.
  - between junctions at a maximum spacing of 3 kilometres
  - on adjacent road systems to guide cyclists to paths
  - on paths directing cyclists to toilets, water, shops etc
- Pavement markings including separation line, edge line, continuity line and stop or give way line as required
- Minimum lighting illumination level of 5 lux.
- Provision of designated crossing points

9.6 Proposed Trunk Routes

A large amount of data was collected and reviewed and this has informed the development of the masterplan. In developing proposed trunk routes for the ACT a brief review was also carried out of similar work in other jurisdictions in Australia and overseas. Cycle maps are available on the internet of many towns and cities although these do not always distinguish between trunk routes and other cycle and walking routes. The underlying land use and built fabric of a city is a determining factor in appropriately defining the major strategic or trunk cycle route network of a city.

In Australia, VicRoads has published maps of its Principal Bicycle Network (PBN) for Melbourne. They show many categories of existing and proposed on-road and of-road cycle facilities. In keeping with Melbourne's city form, the PBN has a predominantly rectangular grid style layout with typically 1.5km to 3km spacing between parallel cycle corridors. The Queensland Government (Queensland Transport) has published maps of its Integrated Regional Cycle Network (ICRN). The ICRN covers most of the South East Queensland urban areas from the Gold Coast through Brisbane to the Sunshine Coast. The ICRN consists of a relatively sparse (compared to VicRoads' PBN) network in an irregular pattern and follows the local landforms that have defined the urban fabric. Parallel routes in the Queensland plan are typically separated from each other by distances of 3 to 6km in the these built up areas.

Overseas cycle master plans examined include examples from Ireland, USA and New Zealand. The Dublin Transportation Office's proposed Cycle Network has a radial/orbital layout with a mesh spacing varying from 0.5 to 1km in the central area to 2 to 3km in suburbs 10km further out. In New York City bicycle maps of the densely populated Brooklyn and Staten Island districts have bicycle routes marked about 1 to 2 km apart. The Auckland Regional Council's Regional Cycle Network Map shows a sparse and irregular shaped cycle network, generally following major roads, with routes typically 3 to 5km apart or more.

For the ACT, trunk routes were initially identified for areas of high travel demand. From the data available significant cycle demand was identified only between North Canberra and Civic. This has been reflected in the proposed masterplan with several routes proposed to be designated as trunk routes running North South along and parallel to Northbourne Avenue. All other origin-destination suburb pairs showed relatively lower cycle and walking demand and dispersed patterns of trip making activity.

Some inferences were drawn from the number of times routes were commented upon in written public submissions during the consultation phase. However, in general there were large numbers of minor issues or routes that received 1 or 2 comments and only a few received more than 5 comments each. The latter were selected out and considered in developing the masterplan. The others were generally too minor, scattered and/or localised to be included in detail.

The proposed network was then developed so that trunk routes connected the major town centres and off-road alternatives were proposed for many, but not all, of the designated on-road arterial cycle routes. The identified network was also expanded to include off-road paths that would serve as feeder routes from some of the larger suburbs to the main inter-town routes. The resulting network has designate routes typically 2 to 3km apart and passing within 2km or less of most homes in Canberra.

The map on **Figure 11** shows the proposed trunk route network.

9.7 End of Trip Facilities

Every bicycle trip has two basic components: the route selected by the cyclist, and the "end-of-trip" facilities available at the destination. The end-of-trip facilities include parking for the bicycle and showers and changing space for the rider. If the end-of-trip facilities do not meet the users' needs, other means of transportation may be used. Potential cyclists often say they would ride more if showers, lockers, and secure bicycle storage were available at their destinations (ie. places of work or education). Lack of end of trip facilities are often cited as a reason for not riding a bicycle for commuter trips. The availability of convenient, secure bicycle parking is therefore a critical factor in an individual's decision whether or not to use a bicycle to commute. Good, secure bicycle parking offers these benefits:

- it inexpensively and efficiently increases a work place's parking capacity;
- it serves those who use bicycles as a mode of transportation; and
- it encourages bicycle use.

As a rule of thumb it is desirable that the number of available bicycle parking spaces should be at least 3% to 5% of the number of car parking spaces available at major destinations such as universities, work places and commercial activities, such as shopping centres. Bicycle parking should be conveniently located to the main entrances of buildings and short term (eg. less than 2 hours) bicycle parking should be no further away from the entrance than the nearest car parking spaces.

Cyclists' needs for bicycle parking range from simply a convenient piece of street furniture, to storage in a bicycle locker that affords weather, theft and vandalism protection, gear storage space, and 24-hour personal access. Where a cyclist's need falls on this spectrum is determined by several factors:

- **Type of trip being made:** whether or not the bicycle will be left unattended all day or just for a few minutes.
- **Weather conditions:** covered bicycle parking is desirable for long term (more than 2 hours) parking to protect bicycles and riders from the risk of rain.
- **Value of the bicycle:** the more a cyclist has invested in a bicycle, the more concern she or he will show for theft protection. New bicycles can cost up to several thousand dollars and bicycle theft is an ongoing problem in most cities, including Canberra.
- **Security of area:** determined by the cyclist's perception of how prone a given area is to bicycle theft. This is fairly subjective, and probably predicated to a degree on an individual's experiences with bicycle theft.

Important needs for many potential cycle commuters are showers, lockers, and changing rooms at their trip destinations. For those cyclists whose employment requires them to dress more formally, travel longer distances, or cycle during wet or hot weather, the ability to shower and change clothing can be just as critical as bicycle storage, in deciding whether or not they will actually cycle to work.

Unlike the en-route infrastructure, responsibility for providing end of trip facilities does not fall solely, or even mainly, to the public sector. End of trip facilities will often be owned and maintained by the

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

proprietor of the destination itself (ie. Employers, landlords, shopping malls etc). It is recommended that the needs for trip end facilities be given greater recognition in future planning documents and policies in the ACT and that measures be considered to encourage their provision in new development applications and retrofitting in existing high use areas.

9.8 Proposed Trunk Routes Within Each Town Area

Summarised below are the main routes proposed for each of the six town areas (Belconnen, City/Inner South, Gungahlin, Inner North, Tuggeranong and Woden Valley/Weston) in the ACT.

Belconnen

- Three on road cycling lanes (Barton Highway, Ginninderra Drive and Belconnen Way) to the City
- Off road path running parallel to Ginninderra Drive
- Off road paths connecting the outer suburbs (Dunlop, McGregor, Holt, Fraser) to Belconnen Town Centre and through to the City
- Off road path around Lake Ginninderra

City/Inner South

- On road cycling lanes heading north (Northbourne Avenue), south (Adelaide Avenue) and east (Canberra Avenue)
- On road cycling lane from the airport to the City
- Off road path from the airport to the city
- Off road path around Lake Burley Griffin

Gungahlin

- Four on road cycling lanes (one to Belconnen, three to the City)
- Off road paths running parallel to Gundaroo Drive, Gungahlin Drive and Flemington Road
- Off road path to Town Centre

Inner North

- On road cycling along Northbourne Avenue

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

- Four on road cycling lanes to Belconnen (Barry Drive, Macarthur Avenue,

  Ginninderra Drive and Barton Highway)
- Two on road cycling lanes to Gungahlin (Barton Highway, Flemington Road)
- Off road path to Australian National University
- Two off road paths/minor street routes running parallel to Northbourne Avenue

Tuggeranong

- Five on road cycling lanes (Athllon Drive, Drakeford Drive, Erindale Drive and Isabella Drive and Monaro Highway)
- Two on road cycling lanes to the Town Centre
- Off road paths running parallel to Drakeford Drive, Isabella Drive, Athllon Drive and Erindale Drive.
- Off road path to Erindale Centre
- Off road path around Lake Tuggeranong

Woden Valley/Weston

- Two on road cycling lanes heading North/South (Yamba Drive/Yarra Glen and Athllon Drive/Melrose Drive).
- One on road cycling lane heading North (Cotter Road)
- One on road cycling lane running East/West from Duffy to Fyshwick along Hindmarsh Drive
- Off road paths running parallel to Athllon Drive and Cotter Road.
- Off road path to Woden Town Centre and Coolaman Court

9.9 Priority Locations for Lighting

Below are the routes with the highest priority for installation of off road path lighting within each of the six town areas (Belconnen, City/Inner South, Gungahlin, , Inner North, Tuggeranong and Woden Valley/Weston).

Belconnen

- Off road paths connecting the outer suburbs (Dunlop, McGregor, Holt, Fraser) to Belconnen Town Centre and through to the City
- Off road path around Lake Ginninderra

City/Inner South

- Off road path from the airport to the city

Gungahlin

- Off road path to past Yerrabi Pond to Town Centre

Inner North

- Off road path to Australian National University

Tuggeranong

- Off road path to Erindale Centre
- Off road path around Lake Tuggeranong

Woden Valley/Weston

- Off road path to Woden Town Centre

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Figure 11: Proposed Trunk Routes (1,707 KB)

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

10 PROPOSED WORKS

10.1 ACT Roads Resealing Program

Each year Roads ACT carries out resealing work on the existing ACT road network. As part of the resealing program, new linemarking is installed. Synergies exist as there is the opportunity to modify the existing lane configuration in conjunction with the resealing and allow provision of on-road cycling where practicable. A copy of Roads ACT's 2004/05 resealing program for arterial roads is included in **Appendix H**. Roads ACT has identified several locations where on-road cycling will be added following the resealing works. Of these locations, seven sections of road coincide with nominated cycling 'Trunk Routes'. These sections are located on Hindmarsh Drive, Drakeford Drive, Cotter Road and Yamba Drive. These sections of road have been included in the Draft Ten Year Capital Works Program although they are expected to be delivered by the end of the 2004/05 financial year.

10.2 Draft Ten Year Capital Works Program

A draft ten year capital works programme has been developed to support the trunk route network shown on **Figure 11**. The detailed capital works items are shown in **Appendix G**, along with indicative unit costs ($/km) for the different work categories.

The following caveats should be noted in reading the draft capital works programme:

- Unit costs have been estimated from a range of recent similar works. However the final extent of works required to bring any particular route section up to the desired trunk standard will require specific investigations at a route and/or project level prior to implementation.
- Existing cycle lanes on arterial roads were surveyed as part of this study. Good base data was therefore available about the condition of these on-road cycle lanes.
- The survey brief did not include measurement of the width of existing traffic lanes. Hence the necessity for widening the road pavement, rather than just re-painting lane lines, to accommodate new on-road cycle lanes has not been determined. Cost estimates for both options have been provided and will need to be refined on a case by case basis prior to implementation.
- No information was available about the condition of existing off-road paths. Therefore, the proposed trunk network was broken into six districts namely Tuggeranong, Woden/Weston Creek, Inner South/City, Inner North, Gungahlin and Belconnen. Assumptions were then made as to the proportions of designated routes that would need various upgrade treatments within each of the districts including provision of signs, provision of linemarking/stencils, widening existing paths and construction of new paths.

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

The following work categories were used in developing the capital works program:

On-Road Cycling

- New On-Road Cycling
- New Symbols & Signs
- Widening, New Symbols & Signs
- Widening & New Signs
- New Signs
- New Symbols

Off-Road Cycling/Minor Streets

- New Signs
- New Symbols
- Reconstruction/Construction of New
- Widening

Proposed works have been categorised into three priority groupings according to whether they should be built within 1 to 3 years, 4 to 7 years or 8 or more years from now. The indicative expenditure (all work categories) by priority is as follows:

Priority	Expenditure
On-Road	
Priority 1 (1-3 years)	$947,400
Priority 2 (4-7 years)	$3,175,610
Priority 3 (>8 years)	$1,328,400

The expenditure is based on no widening of the existing road carriageway

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Priority	Expenditure
Off-Road/Minor Streets	
Belconnen	
Priority 1 (1-3 years)	$72,176
Priority 2 (4-7 years)	$678,210
Priority 3 (>8 years)	$438,734
Gungahlin	
Priority 1 (1-3 years)	$46,264
Priority 2 (4-7 years)	$147,204
Priority 3 (>8 years)	$1,213,247
Inner North	
Priority 1 (1-3 years)	$250,522
Priority 2 (4-7 years)	$310,986
Priority 3 (>8 years)	$1,465,660
Inner South/City	
Priority 1 (1-3 years)	$89,680
Priority 2 (4-7 years)	$606,328
Priority 3 (>8 years)	$2,000,842
Tuggeranong	
Priority 1 (1-3 years)	$8,864
Priority 2 (4-7 years)	$112,480
Priority 3 (>8 years)	$597,314
Woden/Weston Creek	
Priority 1 (1-3 years)	$44,416
Priority 2 (4-7 years)	$284,220
Priority 3 (>8 years)	$570,020

Figure 12 shows the main network deficiencies to be addressed through the works program.

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

10.3 Network Deficiencies

The proposed trunk routes (as shown on **Figure 11**) are a mix of existing routes, some of which need to be upgraded to meet desired standards, and new routes which will need to be implemented from scratch.

The latter have been shown separately on **Figure 12**.

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Figure 12: Proposed Cycle Lanes and Shared Paths (1,616 KB)

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

10.4 Priority Category Criteria

The proposed trunk routes were prioritised into three categories for the Draft Ten Year Capital Works Program. The criteria used for these three categories is shown below:

Priority 1 (Years 1-4)

- Link town centres and major origins/destinations (eg. universities, employment centres)
- High Cycle demand
- Significant comments received from public consultations (typically, comments received from two or more sources).
- Off road paths that only require minor upgrades (lines and signs)

Priority 2 (Years 5-7)

- Significant cycling demand
- Routes nominated through public consultation
- Links to minor origins/destinations (eg district shopping centres)

Priority 3 (Years 8-10)

- Less Cycle Demand
- Feeder routes from larger suburbs to the main inter-town routes
- Widening and/or reconstruction of existing off road paths

10.5 Benefits of Cycling and Walking Infrastructure

Many types of benefits can be credited to cycling and walking. These benefits can be broadly classified according to whether they are primarily benefits to the user of the cycling or walking infrastructure or whether they are benefits to society as a whole. The benefits of improving cycling and walking infrastructure should also be considered with regard to whether they are benefits to people who currently travel by other modes but will switch to cycling or walking, or whether they are are benefits to current walkers and cyclists.

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Societal benefits of increased cycling and walking include:

Cycling and Walking are Environmentally Friendly and Sustainable.

Bicycles need no fuel, give off no fumes and make almost no noise. In fact, the bike is claimed to be the most energy efficient vehicle invented. Increased cycling and walking, particularly if replacing short trips and "cold starts" by car, offers a benefit in improving local air quality.

Cycling and Walking Offer Social and Community Benefits

Cycling and walking are already a chosen transport mode for many young people. They provide children with a sense of independence and increase their road awareness. These modes have the potential to expand their participant base in other age groups too. Cycling and walking are relatively inexpensive and provides access and transportation to segments of Canberra's population that would otherwise not be able to travel (or travel as far, in the case of cycling) independently. It is important to foster cycling and walking as viable transport modes for these groups.

Better cycling and walking facilities are often seen as enhancing the amenity, liveability, equity and quality of life of residents in the areas served.

Cycling and Walking Offer Economic Benefits

It costs far less to provide cycle infrastructure than to provide motorways or roads that accommodate the same number of person trips.

User benefits include:

Cycling and Walking Offer Health Benefits

Physical inactivity levels in Australians are a cause for concern. As activity habits are ingrained at an early age, increasing physical activity among children is of great importance. Incorporating regular cycling and walking into people's everyday lifestyles is one way to increase physical activity.

Improving Canberra's cycling and walking infrastructure, as proposed in the capital works plan, will also provide the following benefits to existing walkers and cyclists:

Travel Time Savings – time saved by reducing the length, and increasing the speed, of travel currently made on existing lower standard routes. Improved directional signage will also facilitate more efficient trip making.

Safety Benefits – providing less conflict with vehicular traffic by providing or improving alternative off-road routes and improving priority control where paths cross roads. The reduction in vehicle conflicts is perceived as a benefit mainly by the user groups who prefer not to cycle on-road. Lighting of paths will also improve security for night time users of the path network.

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Assessment of Benefits

Although the perceived benefits of walking and cycling can be readily described, analysing and quantifying them is often not straightforward. Difficulties encountered in assessing economic benefits of investments in walking and cycling infrastructure include:

- **At which scale?** – Walking trips and their associated infrastructure occur at an inherently smaller scale than cycle trips, which in turn generally tend to be more local than car or passenger transport trips. Should cycling and walking infrastructure benefits be assessed at the scale of the local neighbourhood, across the ACT as a whole, or somewhere in between? Additionally, walking is a component of most trips made by the other modes (car, bus, bicycle, train) and can not be viewed entirely in isolation from them.
- **Who are the beneficiaries?** - Should benefits to potential new walkers and cyclists be given the same weight as benefits to existing walkers and cyclists. The latter group are easier to quantify using standard survey techniques (eg. pedestrian and cycle counts) whereas the former are very uncertain and difficult to measure or validate in practice (eg. stated preference surveys, hedonic pricing).
- **Which benefits?** - Should benefits such as amenity or liveability be included in economic analyses? Should these be compared against more tangible benefits (eg. travel time savings) and benefits of other competing transport investments (eg. for passenger transport or road improvements)? How should on-road safety benefits be quantified and compared to the benefits off-road facilities, especially given the preferences of different user groups for each type of travel.
- **What units or methods should be used?** – What units are appropriate for the health benefits of greater physical activity, air quality benefits or reduced traffic noise? Should non-transport benefits (eg. improved security through path lighting) be assessed and compared against traditional transport benefits (eg. travel time and accident savings). What performance indicators should be used to compare infrastructure options eg. net present value, benefit/cost ratio.

One Australian source (Queensland Transport 2004) cites the following figures as indicative of the economic benefits of cycling and walking:

- The Australian family car costs up to 55c/km to run. In comparison, buying and maintaining a bike costs only 1% of the corresponding car costs.
- To all intents and purposes, there are no operating costs of walking. Walking is essentially free.
- Cycling 10km each way to work each day would save about $1,700/year in transport costs (running costs and depreciation) compared to car travel.
- Bicycle parking is usually free, which provides additional savings for bike travel compared to car use.

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

- For every car trip replaced by a bike ride the community saves 60 cents per kilometre (in road maintenance costs)
- Between 14 and 20 bikes can be parked in the space required to park one car
- Employees who cycle or walk to work are more punctual and take less sick days. Absenteeism can be reduced 14% - 80% by encouraging cycling to work.
- Australia wide, an estimated $600 million could be saved in health care costs annually if 10% more people participated in regular physical activity (eg 30 minutes walking or cycling on most days of the week). On a pro rata basis this equates to a saving of $10 million per annum for health care costs in the ACT.
- Children who walk to school benefit from improved concentration and memory, in addition to the physical health benefits.
- Higher volumes of pedestrians and cyclists on streets and paths means that neighbourhoods are under natural surveillance, thus providing a safer environment for the whole community.

A Norwegian study (NRTP 2002 has estimated that a physically inactive person who starts to walk or cycle to work instead of using a car or public transport gives economic benefit to society of 3,000 to 4,000 Euro (AUD5,000 to AUD7,000) per year. Even someone who is already physically active was estimated to yield a benefit of AUD800 to AUD500 per year by changing from motorised transport to walking or cycling.

One meta study (Krizek 2004) examined economic benefit indicators for various cycling infrastructure projects in six countries (USA, Netherlands, Columbia, Tanzania, India, Norway). The study reported cost-benefit ratios ranging from 1.4:1 to 14.3:1 in sic projects that involved construction of new cycle and walking path infrastructure. These results incorporate numerous assumptions and variables and none are directly comparable to current Australian conditions. However, it is reasonable to assume that the projects required to implement the proposed ACT cycle and walking infrastructure master plan will be beneficial in economic terms. Subject to route specific feasibility studies, it is expected that the works recommend in this report for the ACT will yield cost-benefit ratios greater than 1:1 and typically say 1.5:1 to 4:1.

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

11 CONCLUSIONS

At the present time, it may be said that there is a wide consensus among transportation and other professionals, and amongst public decision makers, that cycling and walking are beneficial modes of transport that should be encouraged as far as practicable, especially in preference to single occupant car travel. This is reflected in key public policy documents, such as the ACT Sustainable Transport Plan. However, there is currently much less of a consensus as to how to overcome the difficulties inherent in evaluating the benefits of specific cycling and walking infrastructure investments and to choose between competing options for spending public funds.

For the development of Canberra's trunk cycling and walking infrastructure, the critical first step has been to define a city-wide network of trunk routes (on-road cycle facilities and off road paths). That has been done and shown on the master plan in this report. The next steps are to undertake feasibility studies on a corridor by corridor basis to quantify the physical works required to bring each route up to the desired trunk standard. These can then be implemented progressively as funding permits over the coming years.

BROWN CONSULTING (ACT) PTY LTD

September 2004

APPENDICES

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

APPENDIX A

Background Data (35 KB)

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

APPENDIX B

On Road Cycle Lane Survey (1,091 KB)

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

APPENDIX C

Summary of ACTRAMS Database Comments (33 KB)

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

APPENDIX D

Summary of Public Complaints (28 KB)

(including Correspondence to Minister)

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

APPENDIX E

Pedal Power Submission (57 KB)

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

APPENDIX F

Summary of Public Comments and Sketch Maps (5,591 KB)

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

APPENDIX G

Draft Capital Works Programme (48 KB)

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

APPENDIX H

Roads ACT's 2004/05 Resealing Program – Arterial Roads (14 KB)

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

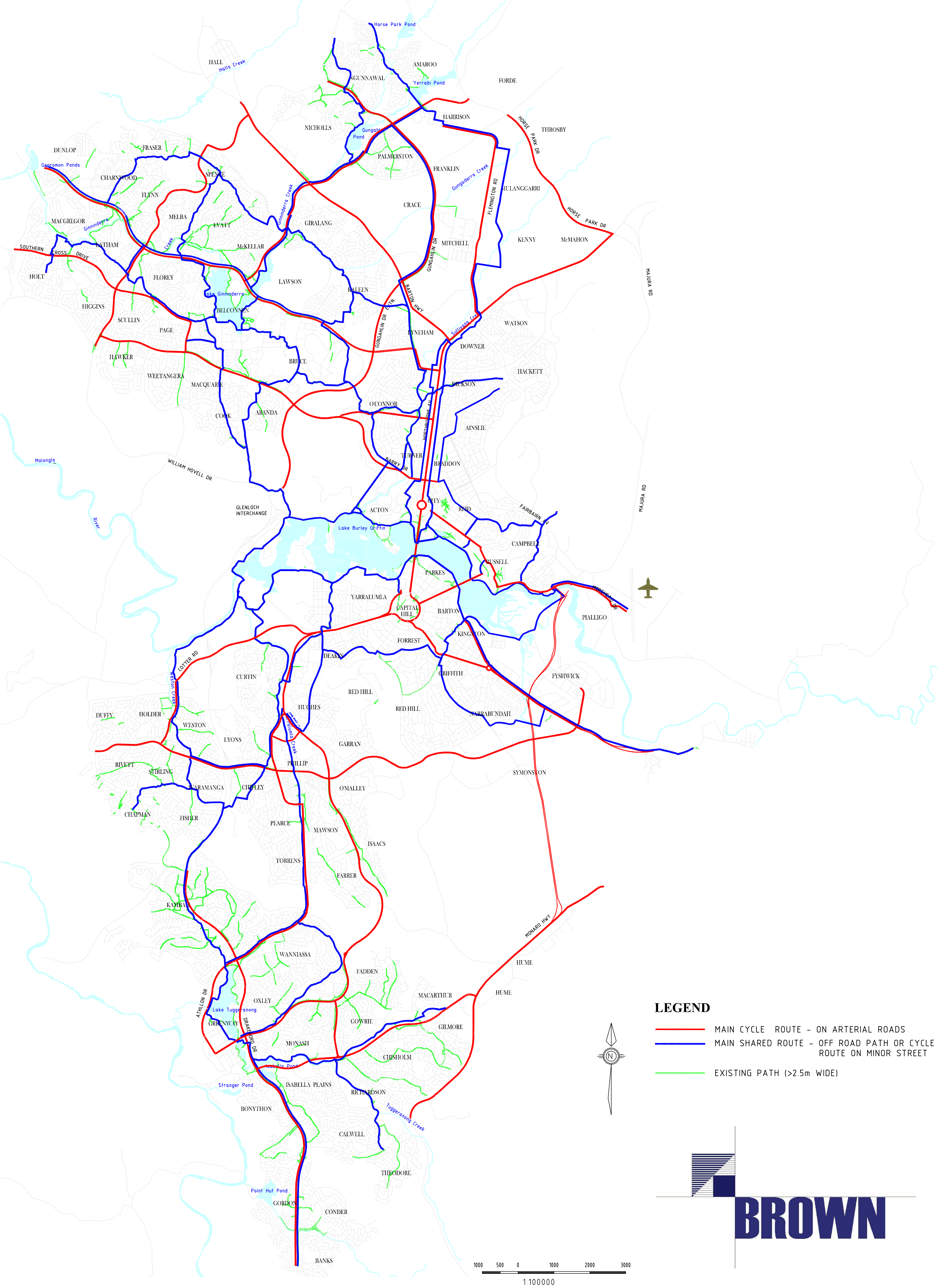
APPENDIX I

Detailed Demand Data (61 KB)

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

TEN YEAR MASTER PLAN
TRUNK CYCLING AND
WALKING PATH INFRASTRUCTURE
2004 - 2014

FIGURE E1 - PROPOSED MAIN ROUTES



LEGEND

- MAIN CYCLE ROUTE - ON ARTERIAL ROADS
- MAIN SHARED ROUTE - OFF ROAD PATH OR CYCLE ROUTE ON MINOR STREET
- EXISTING PATH (>2.5m WIDE)

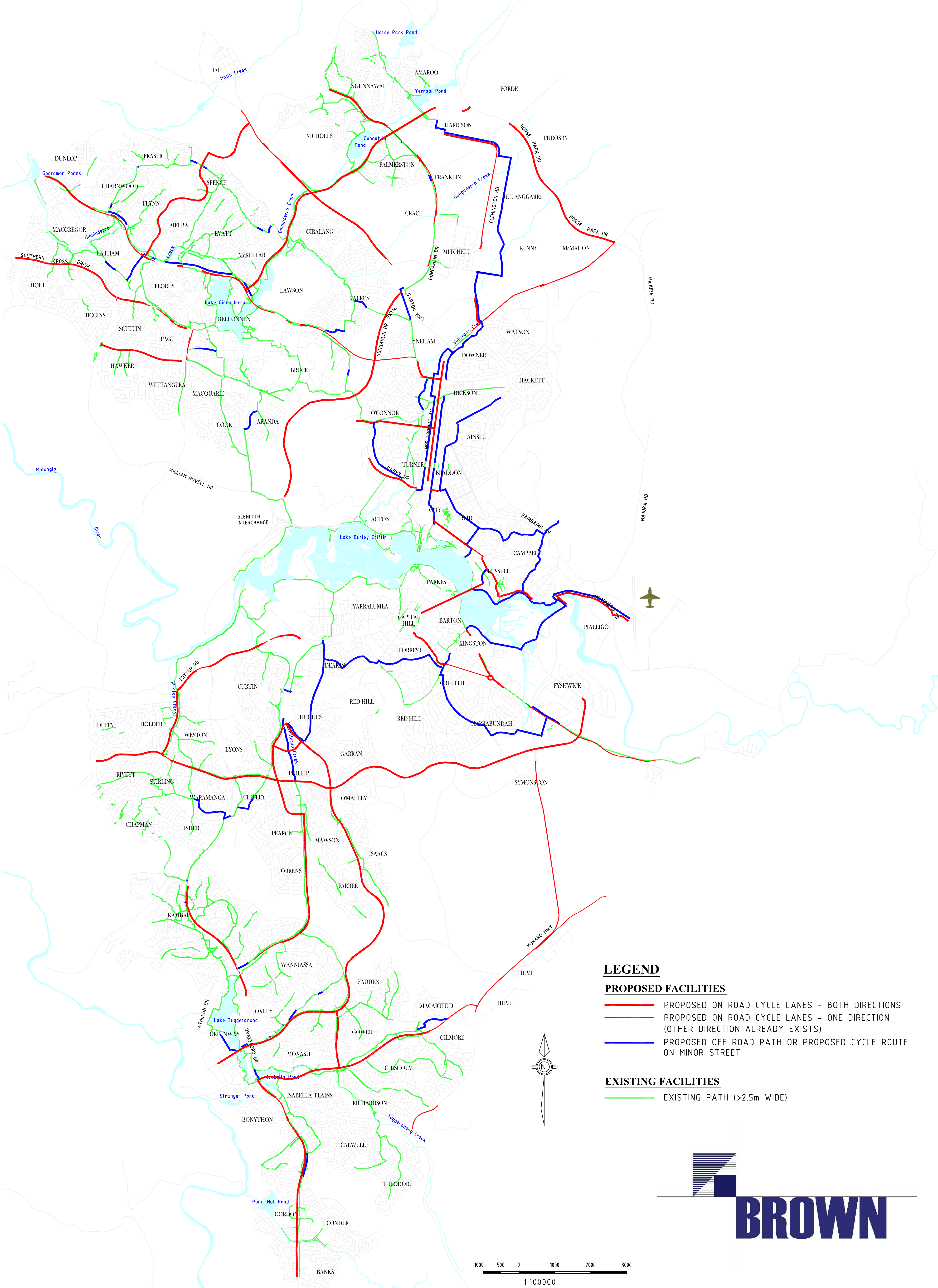
H:\C03000\C03081\drawing\C03081trunkroutesfigureE1.dwg

Roads ACT
URBAN SERVICES

actpla ACT PLANNING & LAND AUTHORITY

TEN YEAR MASTER PLAN TRUNK CYCLING AND WALKING PATH INFRASTRUCTURE 2004 - 2014

FIGURE E2 - PROPOSED CYCLE LANES AND SHARED PATHS



LEGEND

PROPOSED FACILITIES

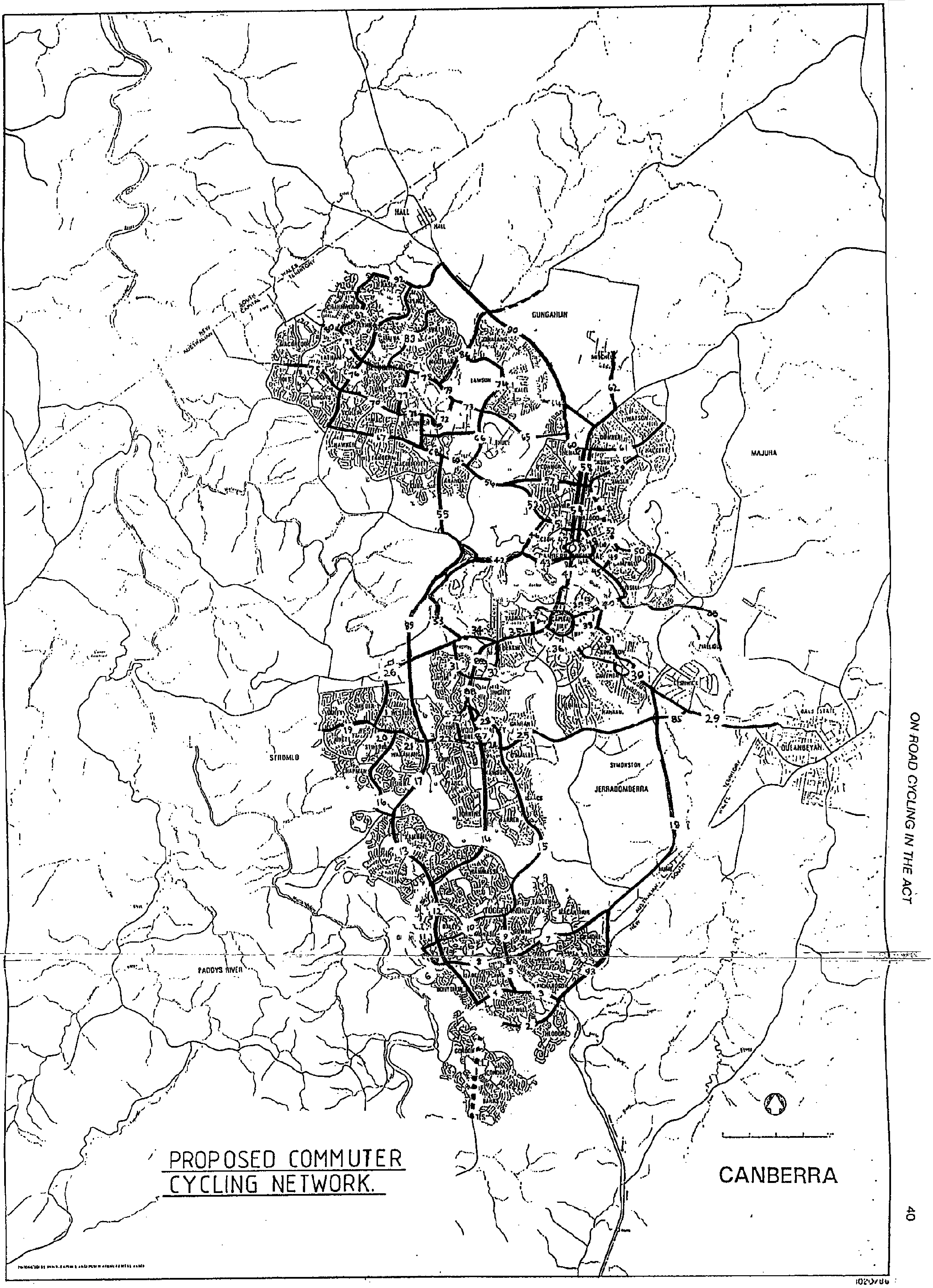
- PROPOSED ON ROAD CYCLE LANES - BOTH DIRECTIONS
- PROPOSED ON ROAD CYCLE LANES - ONE DIRECTION (OTHER DIRECTION ALREADY EXISTS)
- PROPOSED OFF ROAD PATH OR PROPOSED CYCLE ROUTE ON MINOR STREET

EXISTING FACILITIES

- EXISTING PATH (>2.5m WIDE)

BROWN

H:\C03000\C03081\drawing\C03081Missing LinksFigure E2.dwg



Arup Transportation Planning

Feilman

ON ROAD CYCLING IN THE ACT

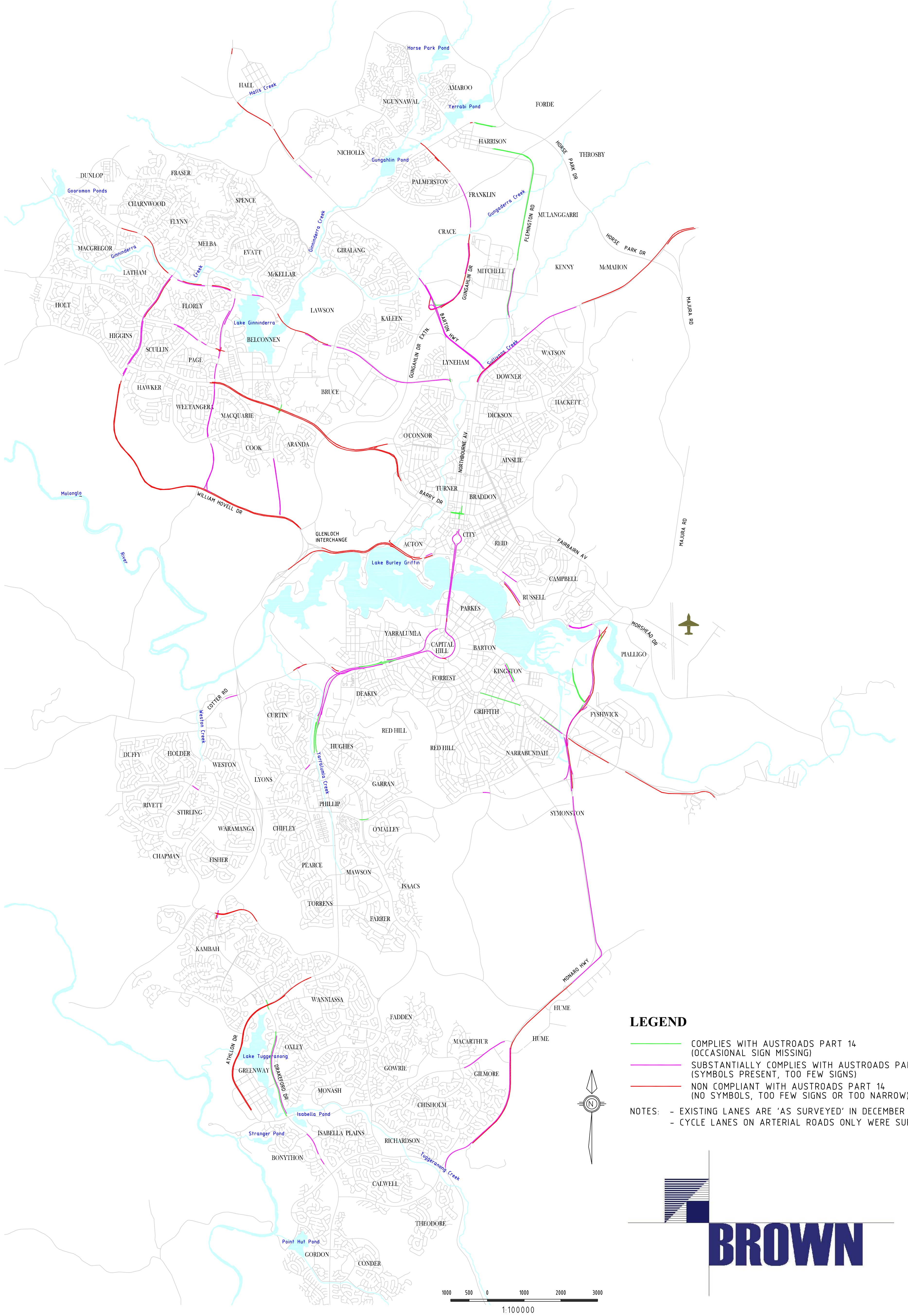
Figure 1: 1992 Trunk Cycle Routes

Roads ACT
URBAN SERVICES

TEN YEAR MASTER PLAN
TRUNK CYCLING AND WALKING PATH INFRASTRUCTURE
2004 - 2014

actpla ACT PLANNING & LAND AUTHORITY

FIGURE 2: EXISTING ON-ROAD CYCLE LANES ON ARTERIAL ROADS (SURVEYED DECEMBER 2003)



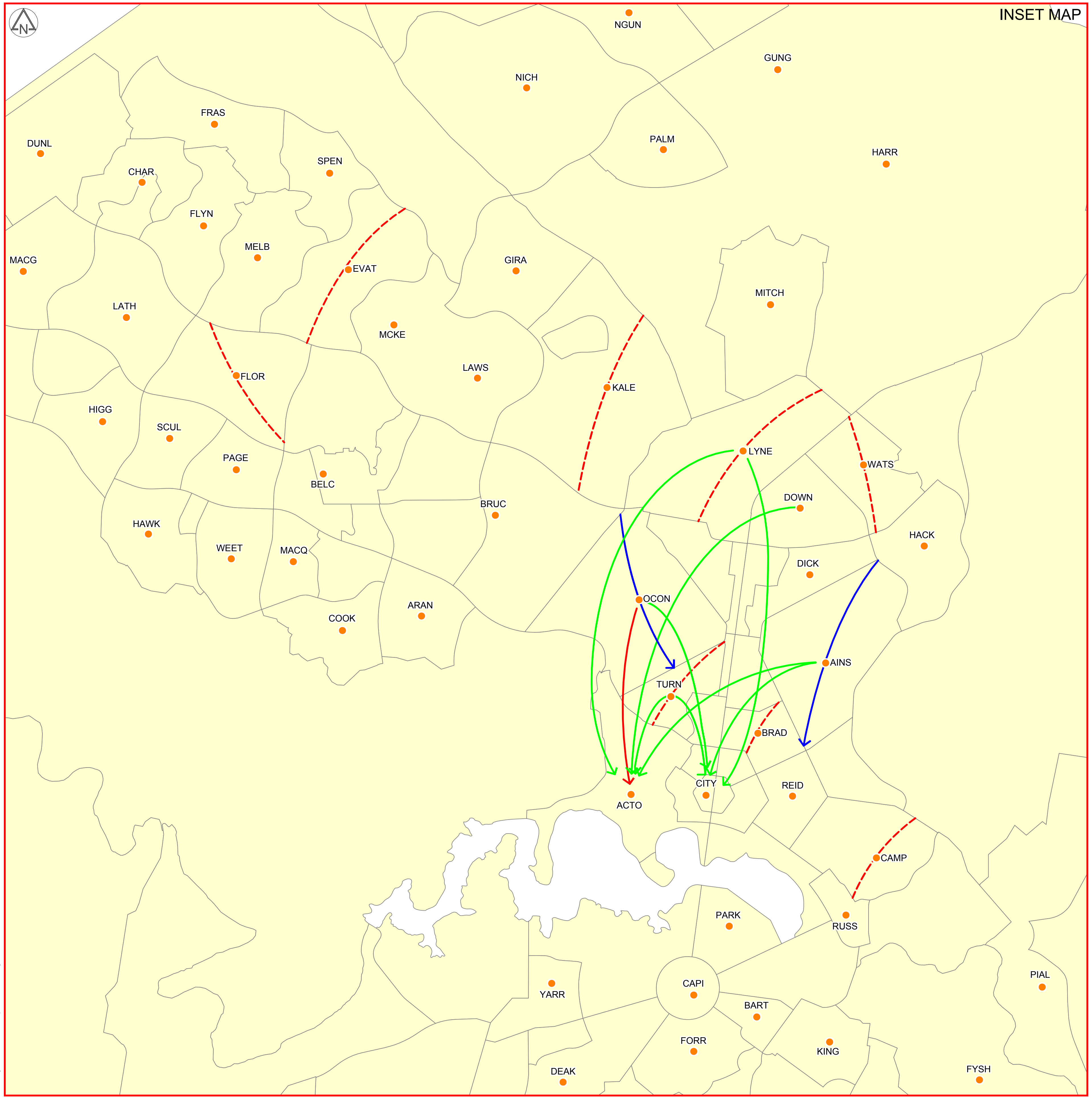
LEGEND

- COMPLIES WITH AUSTROADS PART 14 (OCCASIONAL SIGN MISSING)
- SUBSTANTIALLY COMPLIES WITH AUSTROADS PART 14 (SYMBOLS PRESENT, TOO FEW SIGNS)
- NON COMPLIANT WITH AUSTROADS PART 14 (NO SYMBOLS, TOO FEW SIGNS OR TOO NARROW)

NOTES:
- EXISTING LANES ARE 'AS SURVEYED' IN DECEMBER 2003
- CYCLE LANES ON ARTERIAL ROADS ONLY WERE SURVEYED

BROWN

H:\C03000\C03081\drawing\C03081Figure2 Final.dwg



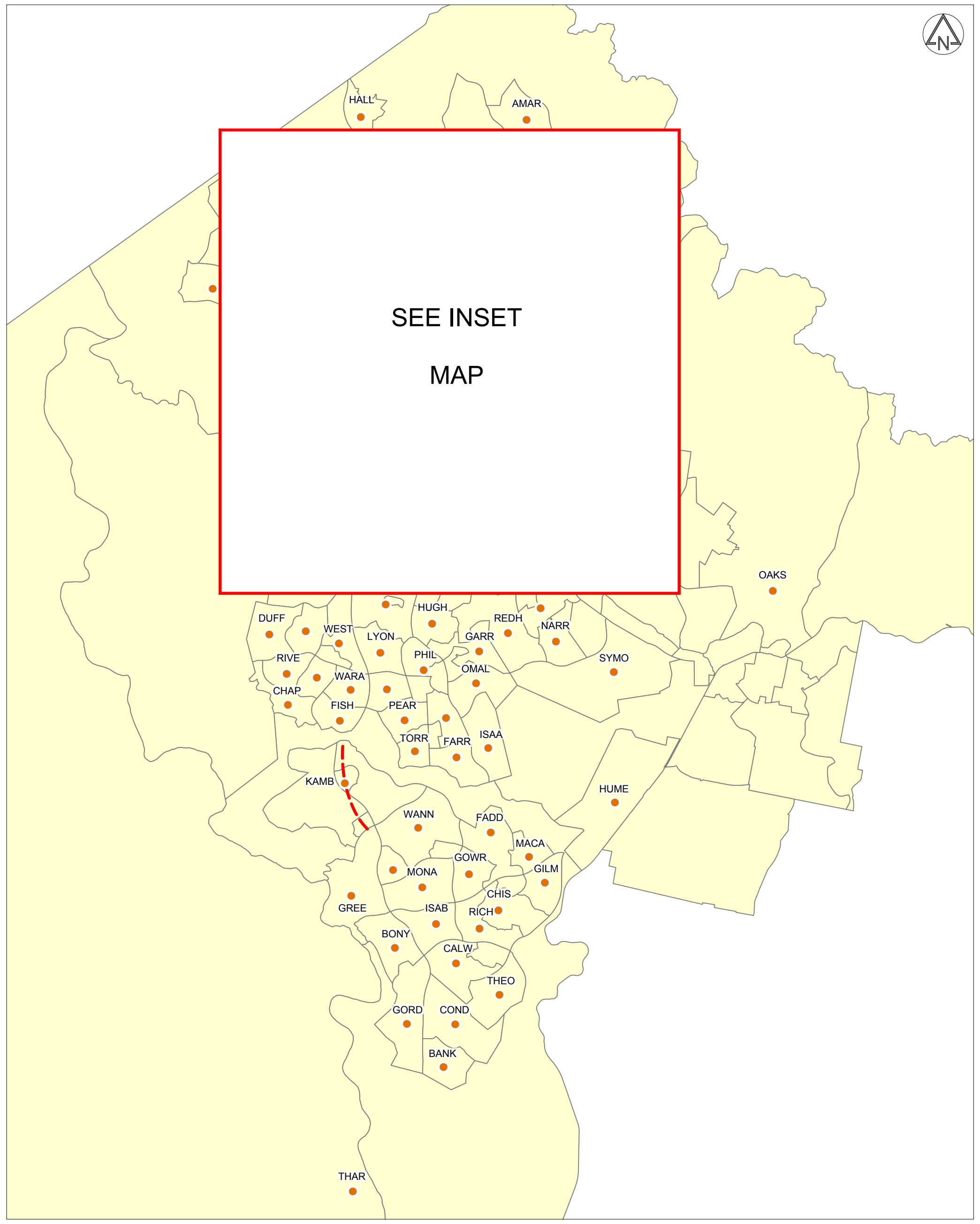
J:\Project\83430\Maps\Desire Cycle Line.wor 30/01/04 TPK

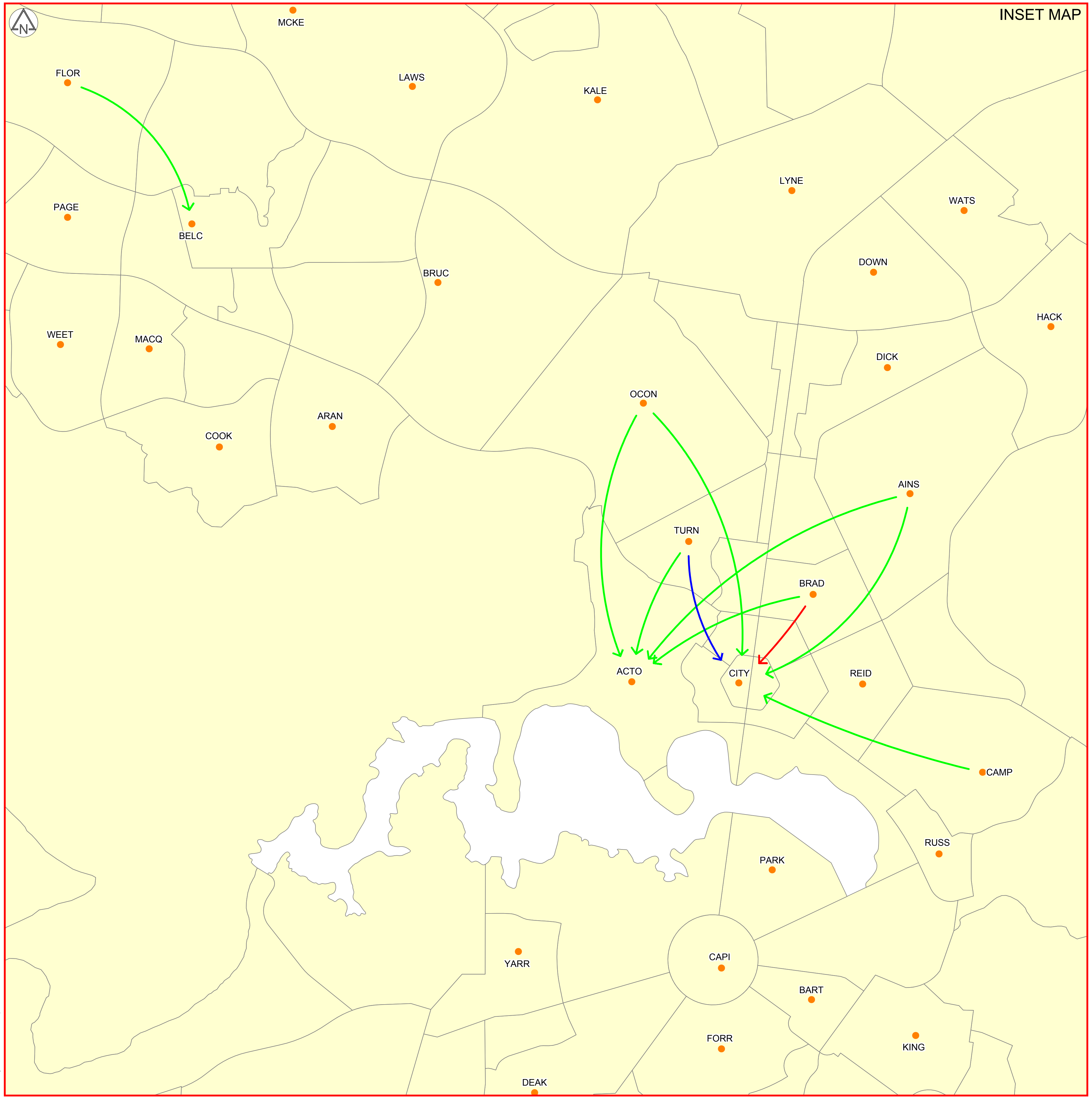
TEN-YEAR MASTER PLAN FOR TRUNK CYCLING AND WALKING PATH INFRASTRUCTURE 2004-14

FIGURE 3
DEMAND IN ACT @ 2001

Cycle Desire Line Trips

- 20-49 Trips Per Day
- 50-99 Trips Per Day
- 50-99 Trip Per Day (Within Suburb)
- 100-149 Trip Per Day (Within Suburb)



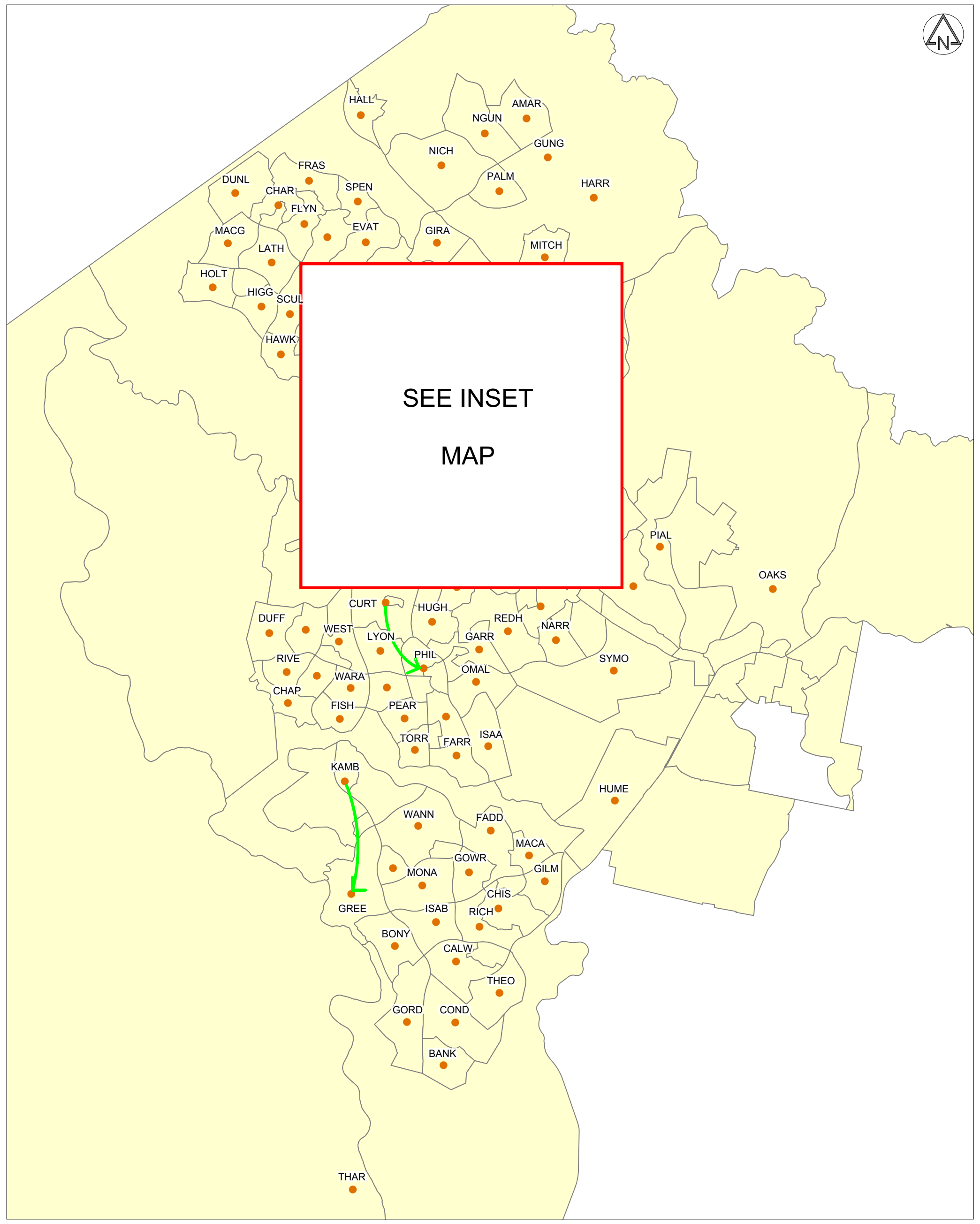


TEN-YEAR MASTER PLAN FOR TRUNK CYCLING AND WALKING PATH INFRASTRUCTURE 2004-14

FIGURE 4
PEDESTRIAN DEMAND 2001
Journey To Work Data 2001

Pedestrian Trips

- 11-40 Trips Per Day
- 41-80 Trips Per Day
- > 80 Trips Per Day



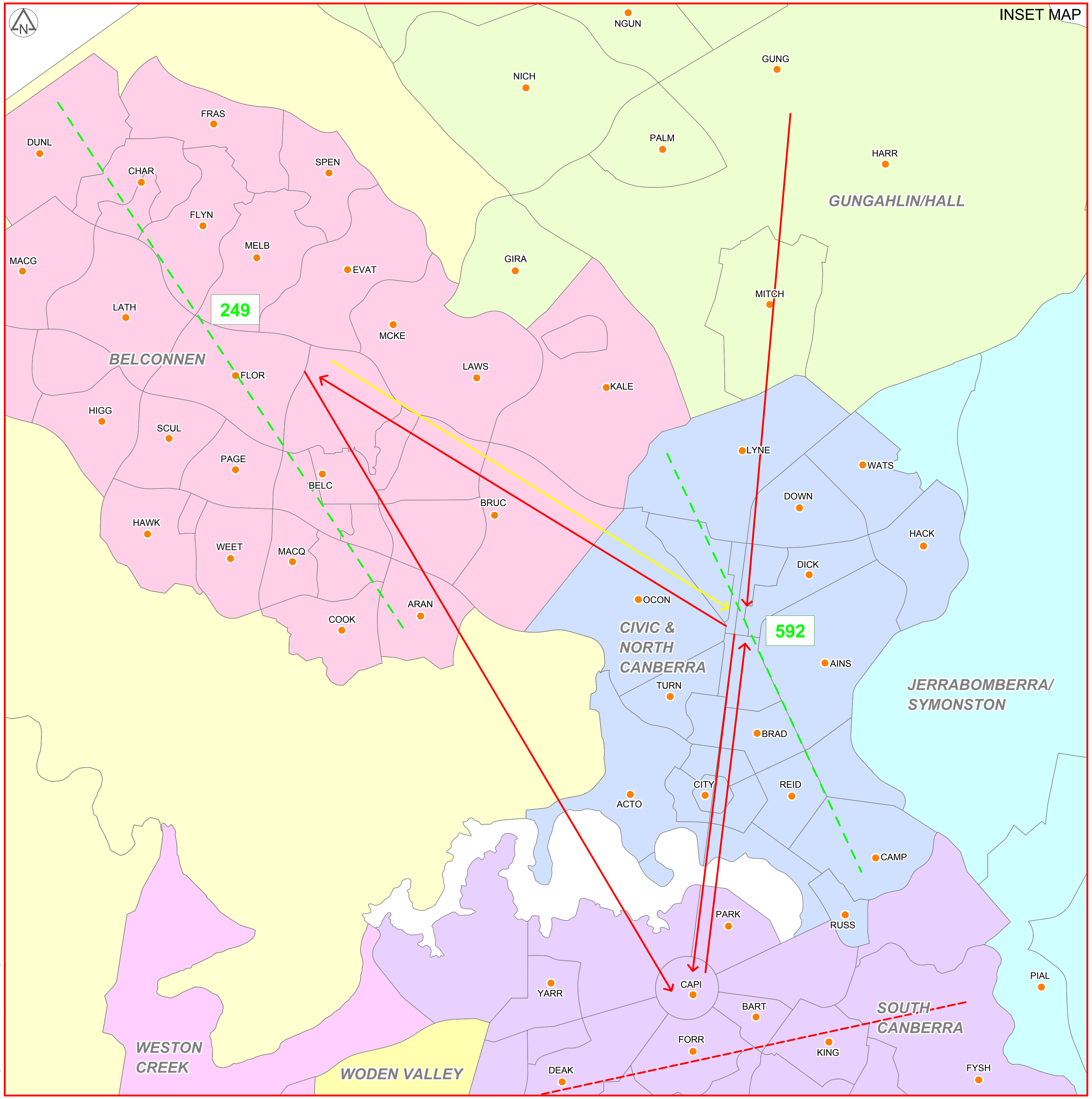
J:\Project\83430\Maps\Ped Demand.wor 30/01/04 TPK

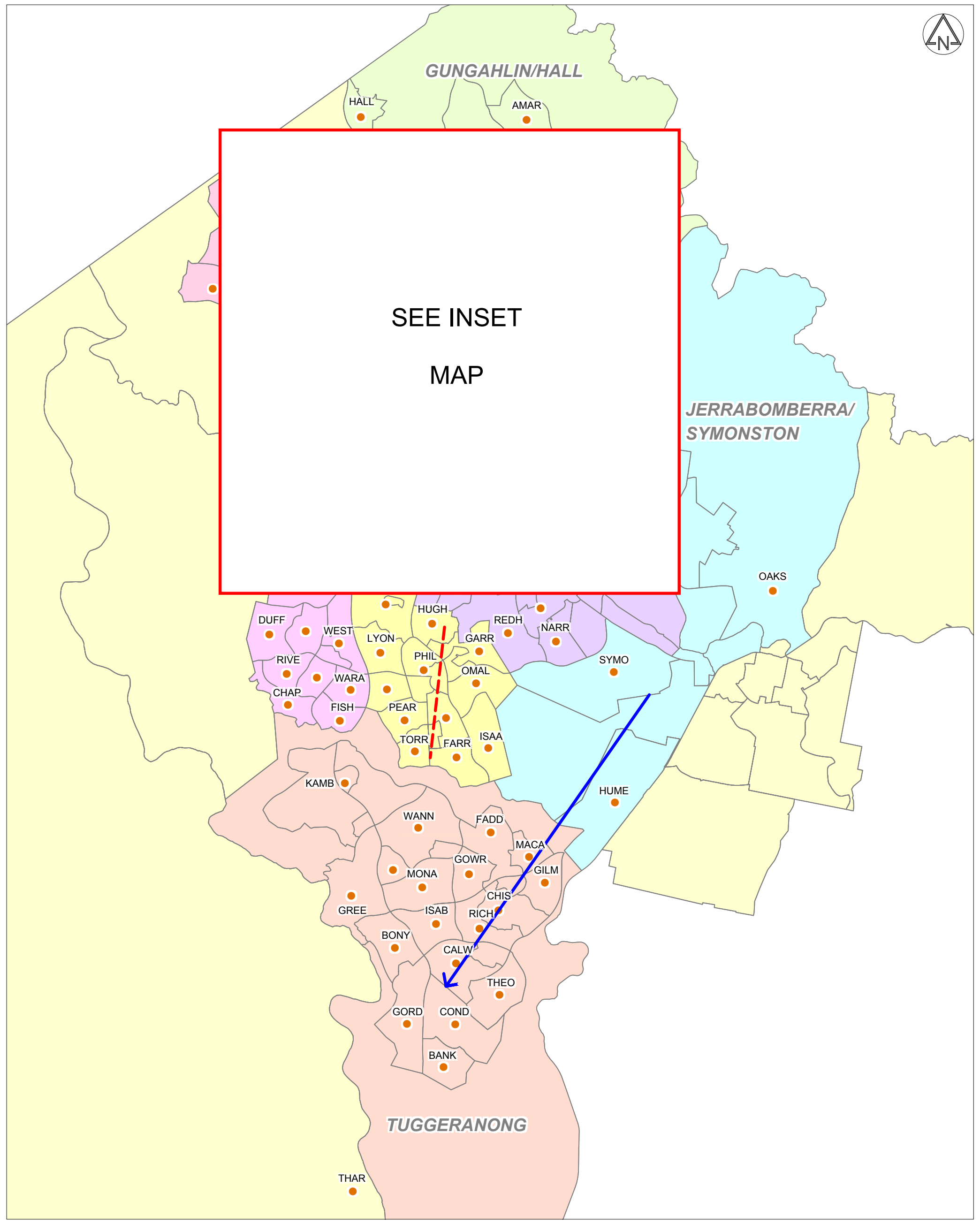
TEN-YEAR MASTER PLAN FOR TRUNK CYCLING AND WALKING PATH INFRASTRUCTURE 2004 -14

FIGURE 5
CYCLE DEMAND IN ACT @ 2001 DISTRICTS

Legend

- 50-99 Trips Per Day
- 50-99 Trips Per Day (Within District)
- 100-149 Trips Per Day
- 150-199 Trips Per Day
- >200 Trips Per Day (Within District)

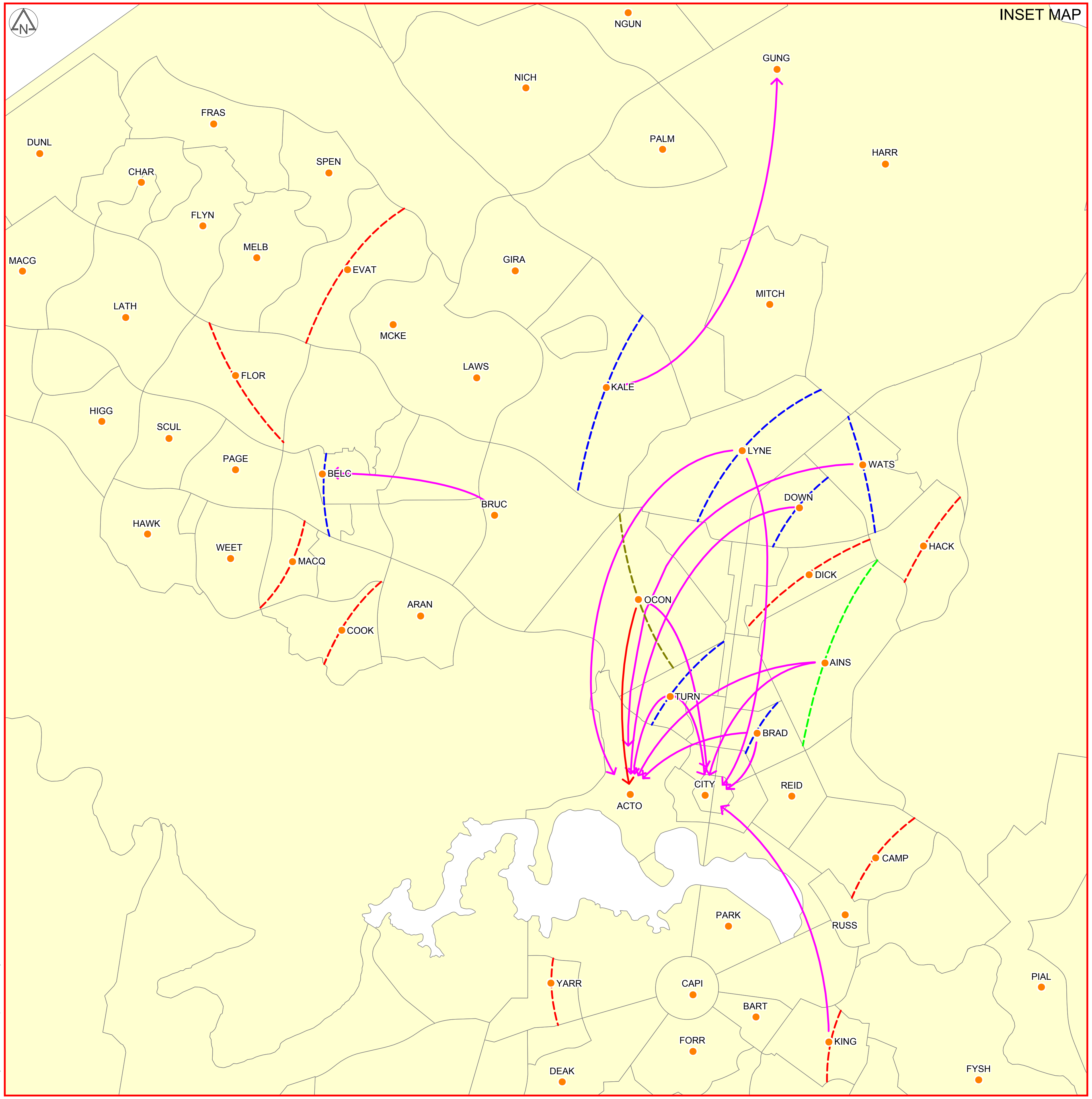




J:\Project\83430\Maps\Desire Cycle Line3.wor 02/03/04 TPK

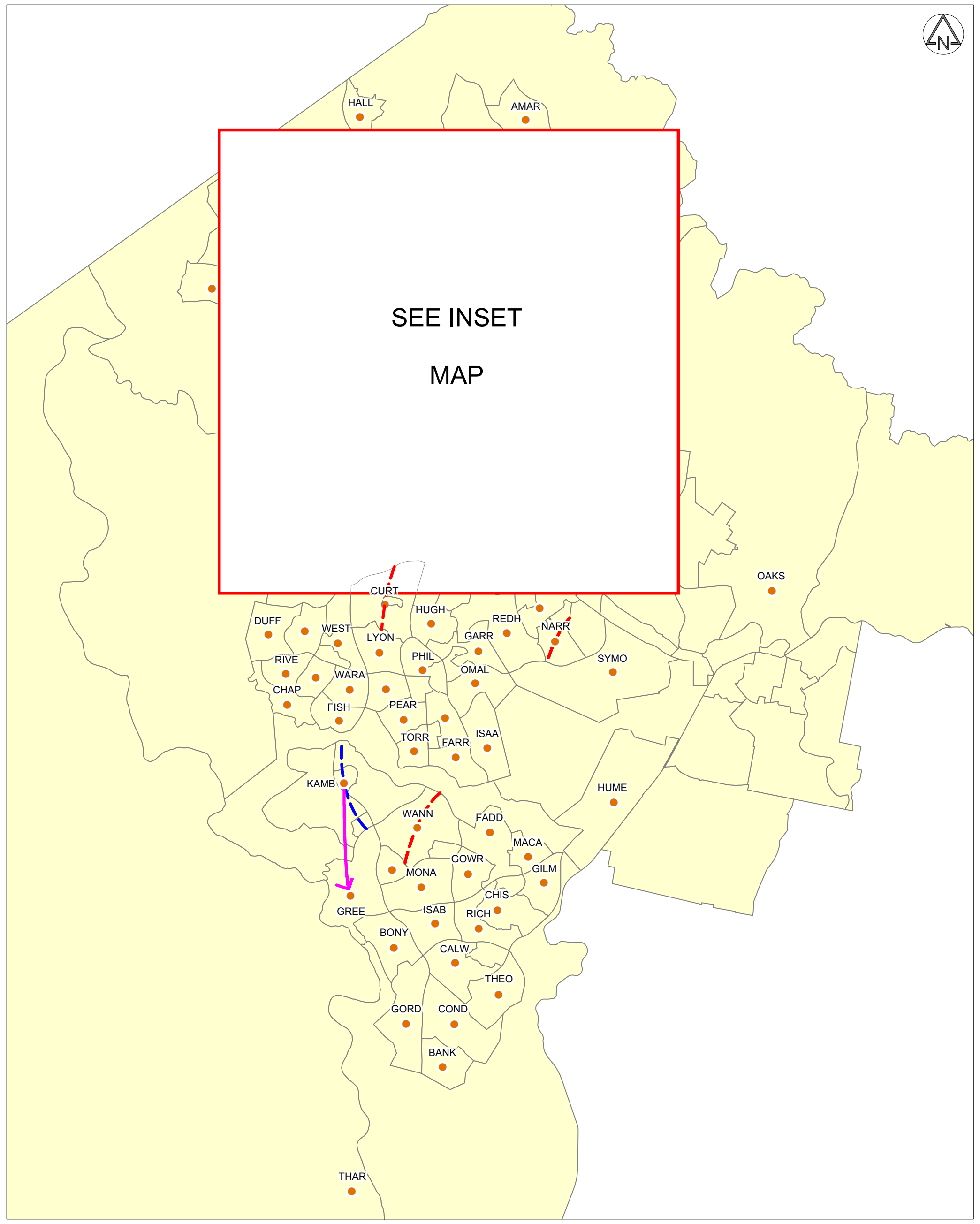
TEN-YEAR MASTER PLAN FOR TRUNK CYCLING AND WALKING PATH INFRASTRUCTURE 2004-14

FIGURE 6
PROJECTED CYCLE DESIRE LINE IN ACT @ 2013



Cycle Desire Line Trips

- 20-49 Trips Per Day
- 50-99 Trips Per Day
- 50-99 Trip Per Day (Within Suburb)
- 100-149 Trip Per Day (Within Suburb)
- 150-199 Trip Per Day (Within Suburb)
- 200-249 Trip Per Day (Within Suburb)



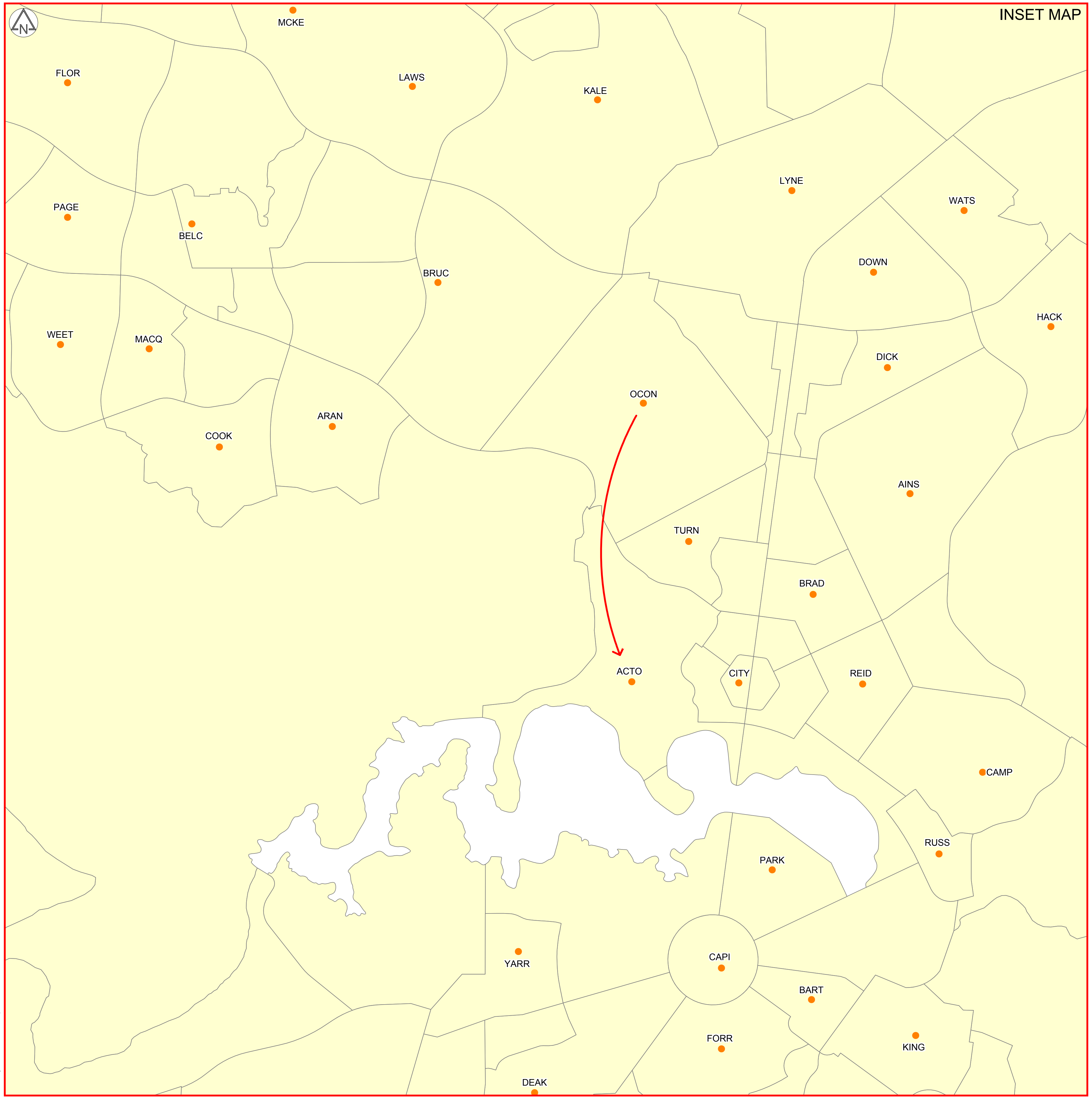
J:\Project\83430\Maps\Desire Cycle Line 2.wor 30/01/04 TPK

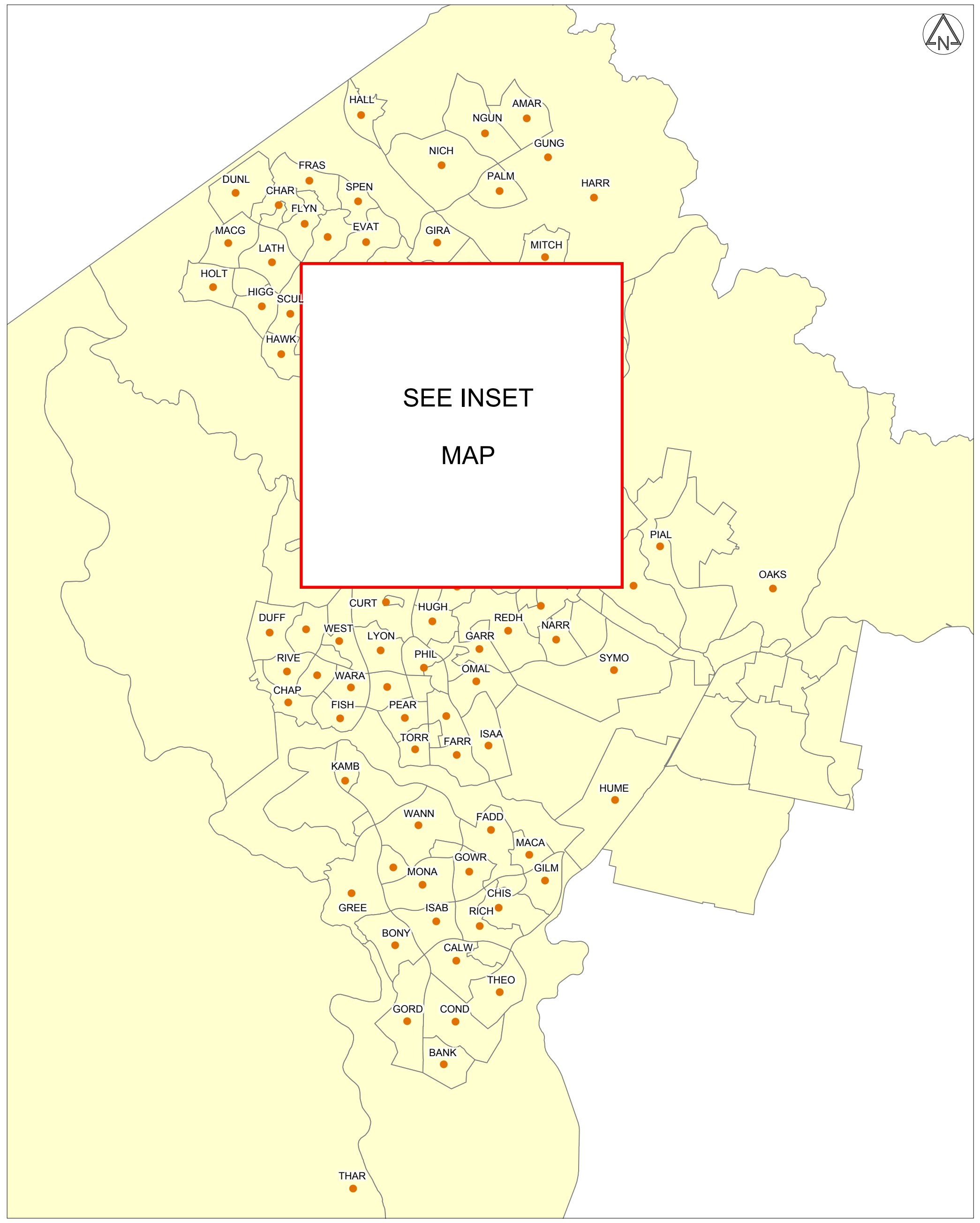
TEN-YEAR MASTER PLAN FOR TRUNK CYCLING AND WALKING PATH INFRASTRUCTURE 2004-14

FIGURE 7
PROJECTED PEDESTRIAN DESIRE LINE IN ACT @ 2013

Pedestrian Trips

39 Trips Per Day





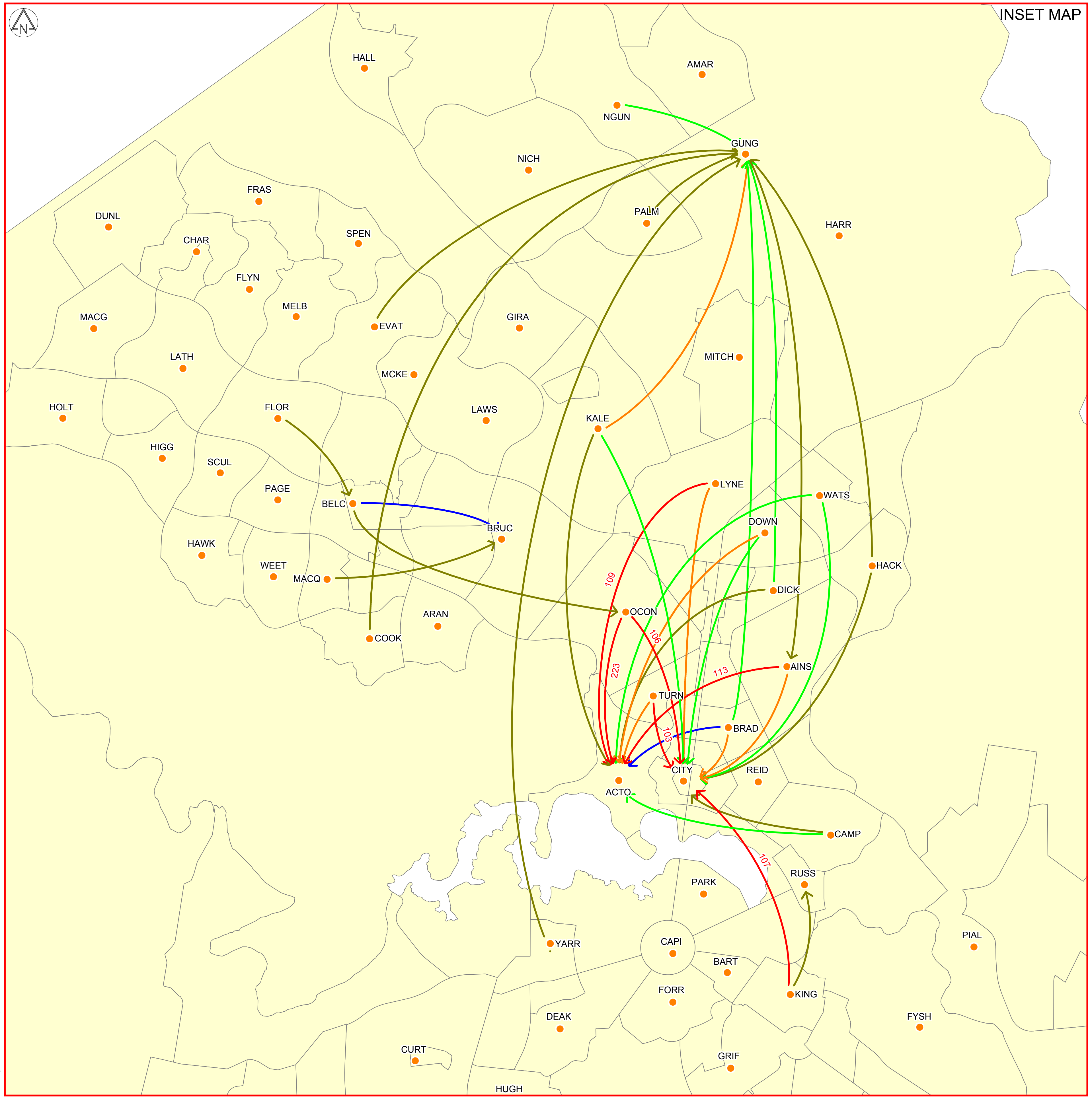
J:\Project\83430\Maps\Ped Desire Line.wor 30/01/04 TPK

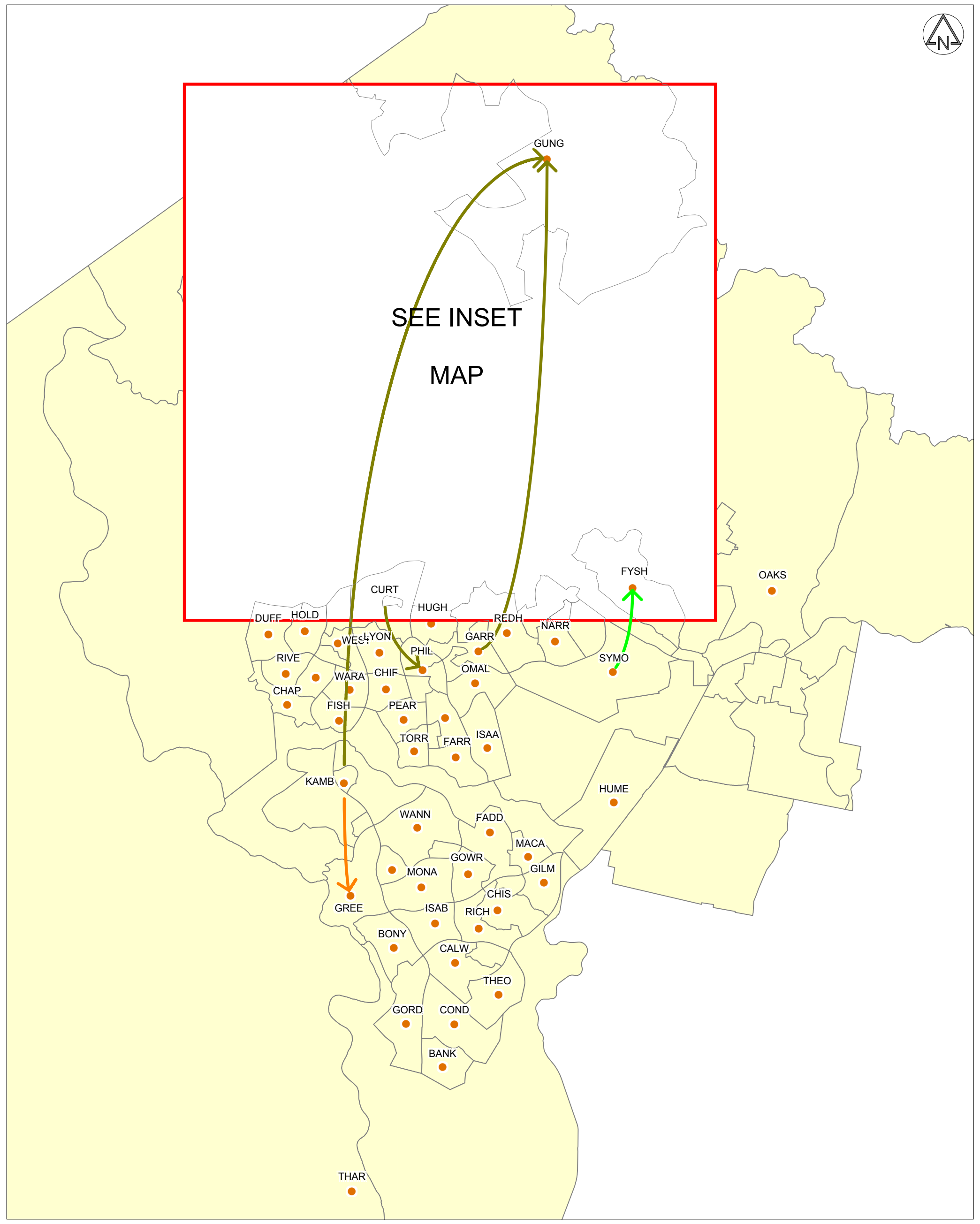
TEN-YEAR MASTER PLAN FOR TRUNK CYCLING AND WALKING PATH INFRASTRUCTURE 2004-14

FIGURE 8
PROJECTED CYCLE DESIRE LINES
IN ACT @ 2013 BASED ON
6% CYCLE MODE SPLIT

Inter Suburb Trips

- 41-50 Trips Per Day
- 51-60 Trips Per Day
- 61-70 Trips Per Day
- 71-100 Trips Per Day
- >100 Trips Per Day (as indicated)





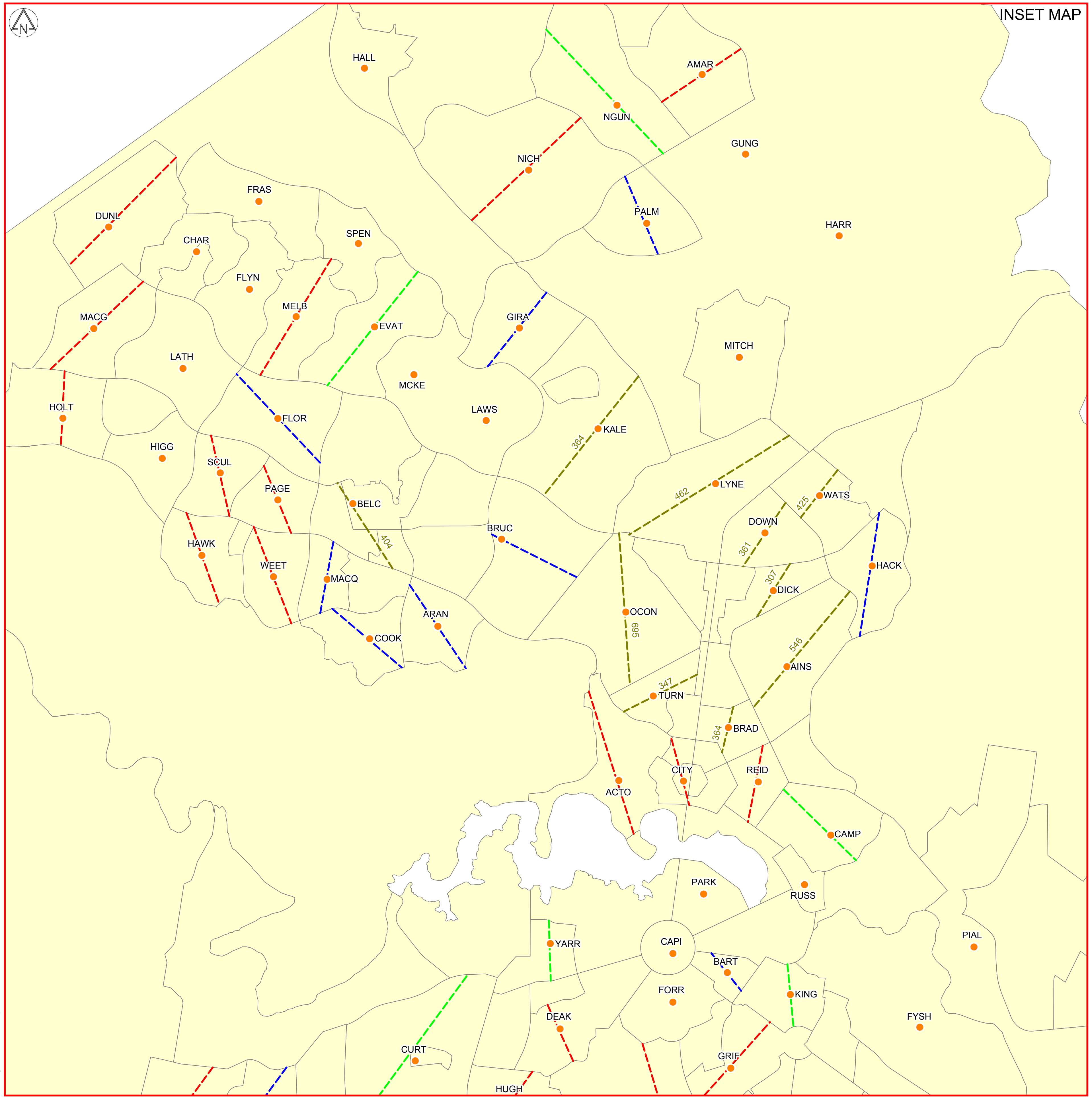
J:\Project\83430\Maps\InterSuburb.wor 23/03/04 TPK

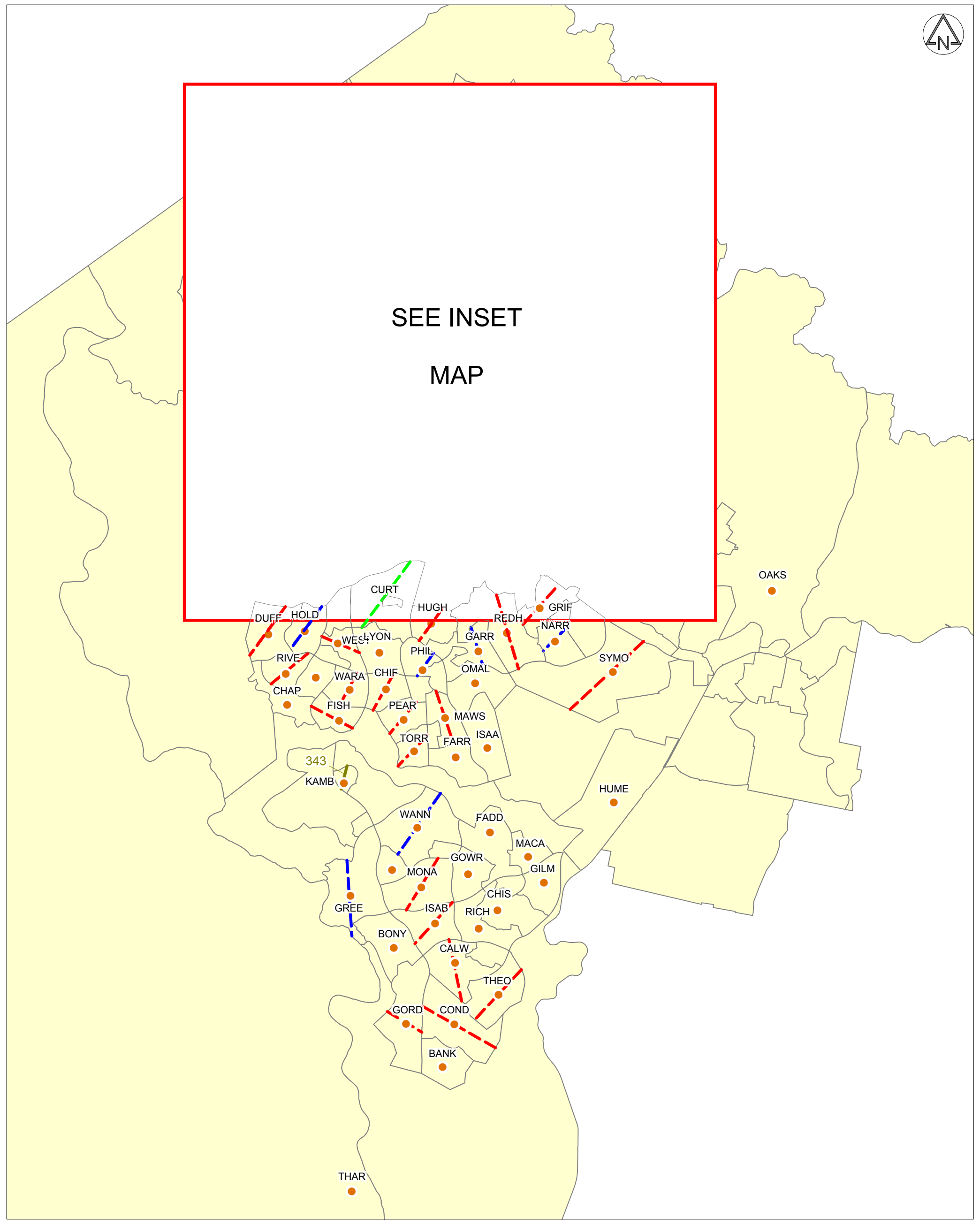
TEN-YEAR MASTER PLAN FOR TRUNK CYCLING AND WALKING PATH INFRASTRUCTURE 2004-14

FIGURE 9
PROJECTED CYCLE DESIRE LINES IN ACT @ 2013 BASED ON 6% CYCLE MODE SPLIT

Intra Suburb Cycle Trips

- 51-100 Trips Per Day
- 101-200 Trips Per Day
- 201-300 Trips Per Day
- > 300 Trips Per Day (as indicated)





J:\Project\83430\Maps\IntraSuburb.wor 23/03/04 TPK

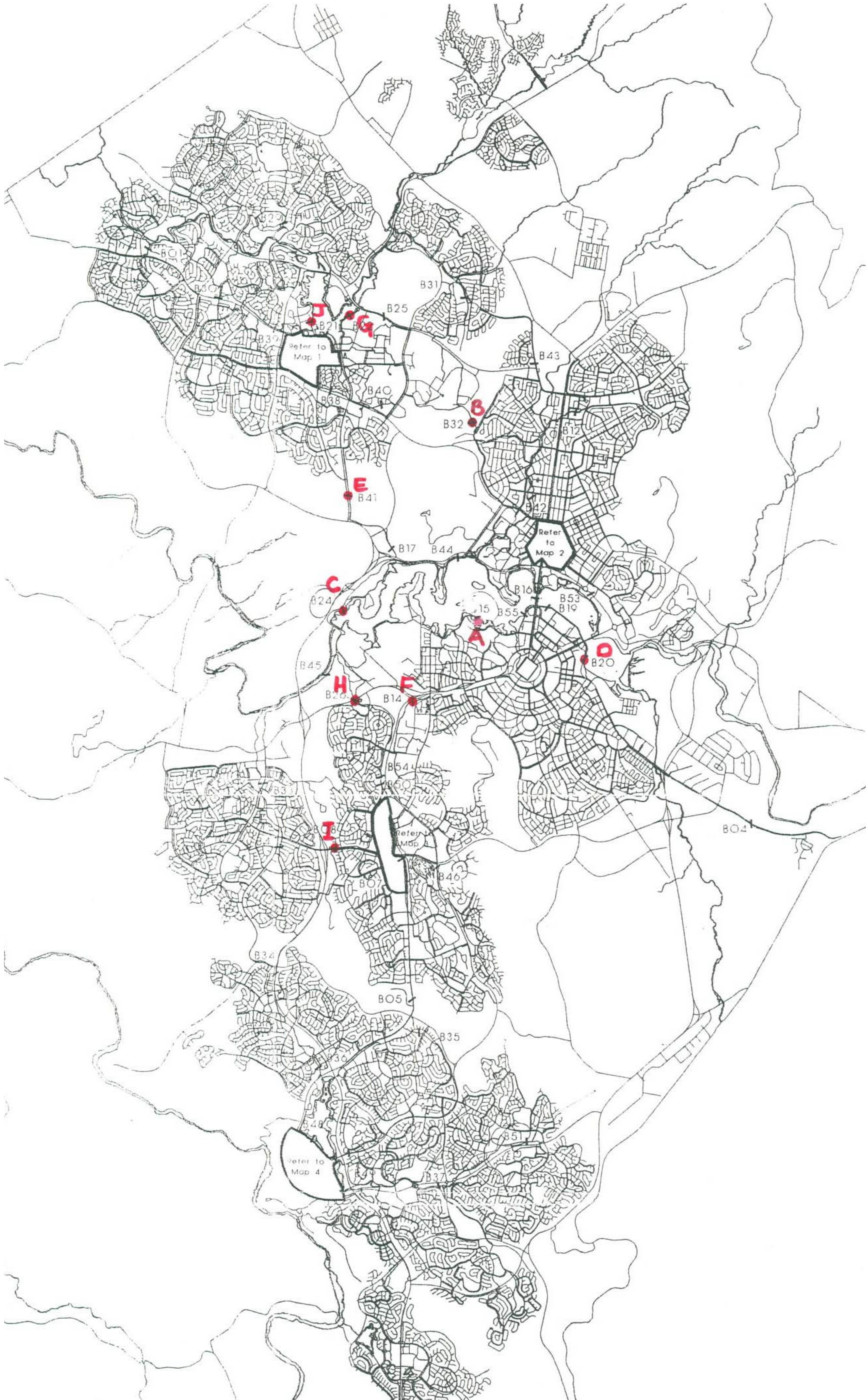


Figure 10: Cyclist Spot Count Sites 1991-94

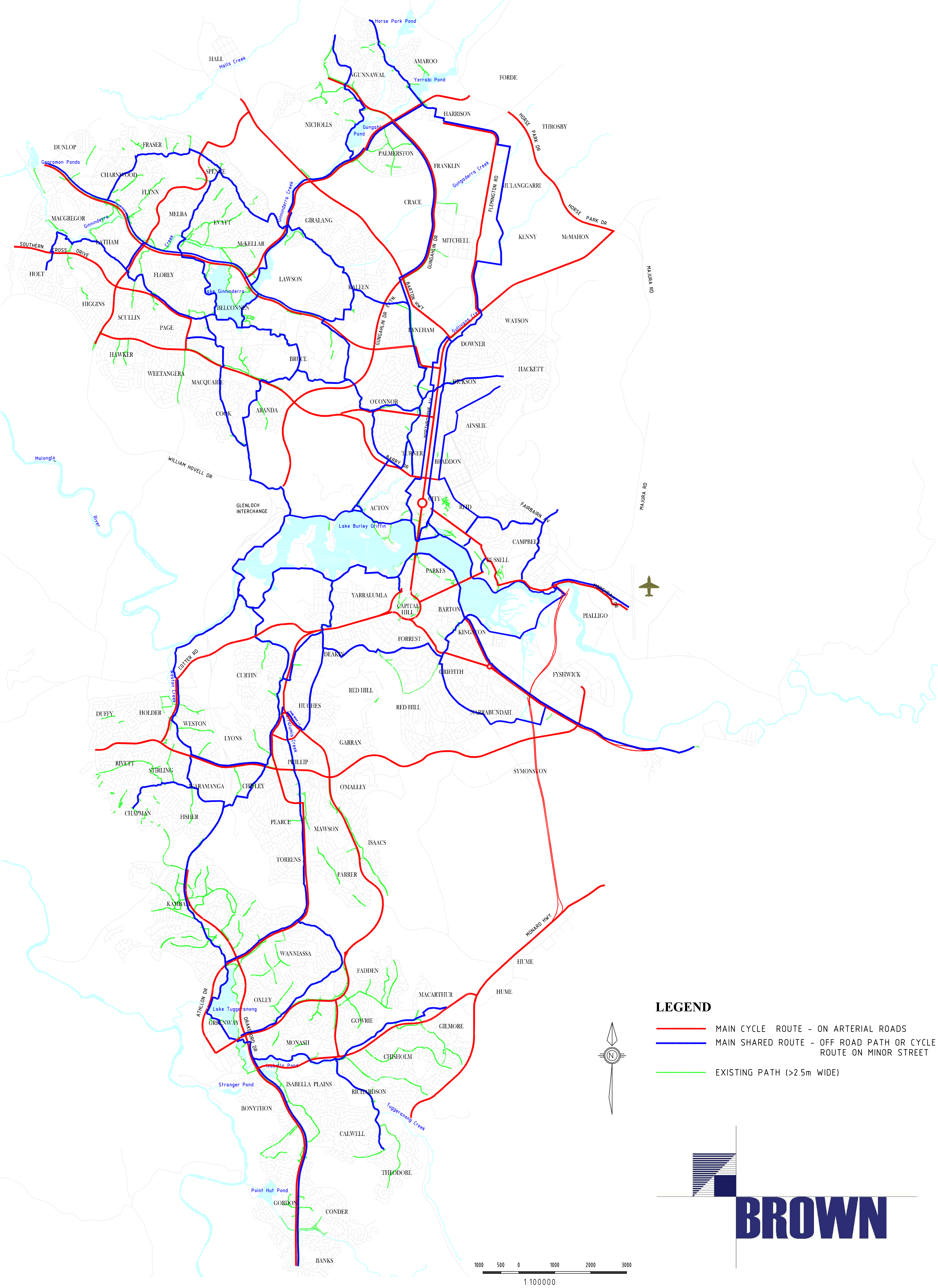
Roads ACT

URBAN SERVICES

TEN YEAR MASTER PLAN
TRUNK CYCLING AND
WALKING PATH INFRASTRUCTURE
2004 - 2014

actpla ACT PLANNING & LAND AUTHORITY

FIGURE 11 - PROPOSED MAIN ROUTES



LEGEND

- MAIN CYCLE ROUTE - ON ARTERIAL ROADS
- MAIN SHARED ROUTE - OFF ROAD PATH OR CYCLE ROUTE ON MINOR STREET
- EXISTING PATH (>2.5m WIDE)

BROWN

H:\C03000\C03081\drawing\C03081trunkroutes4.dwg

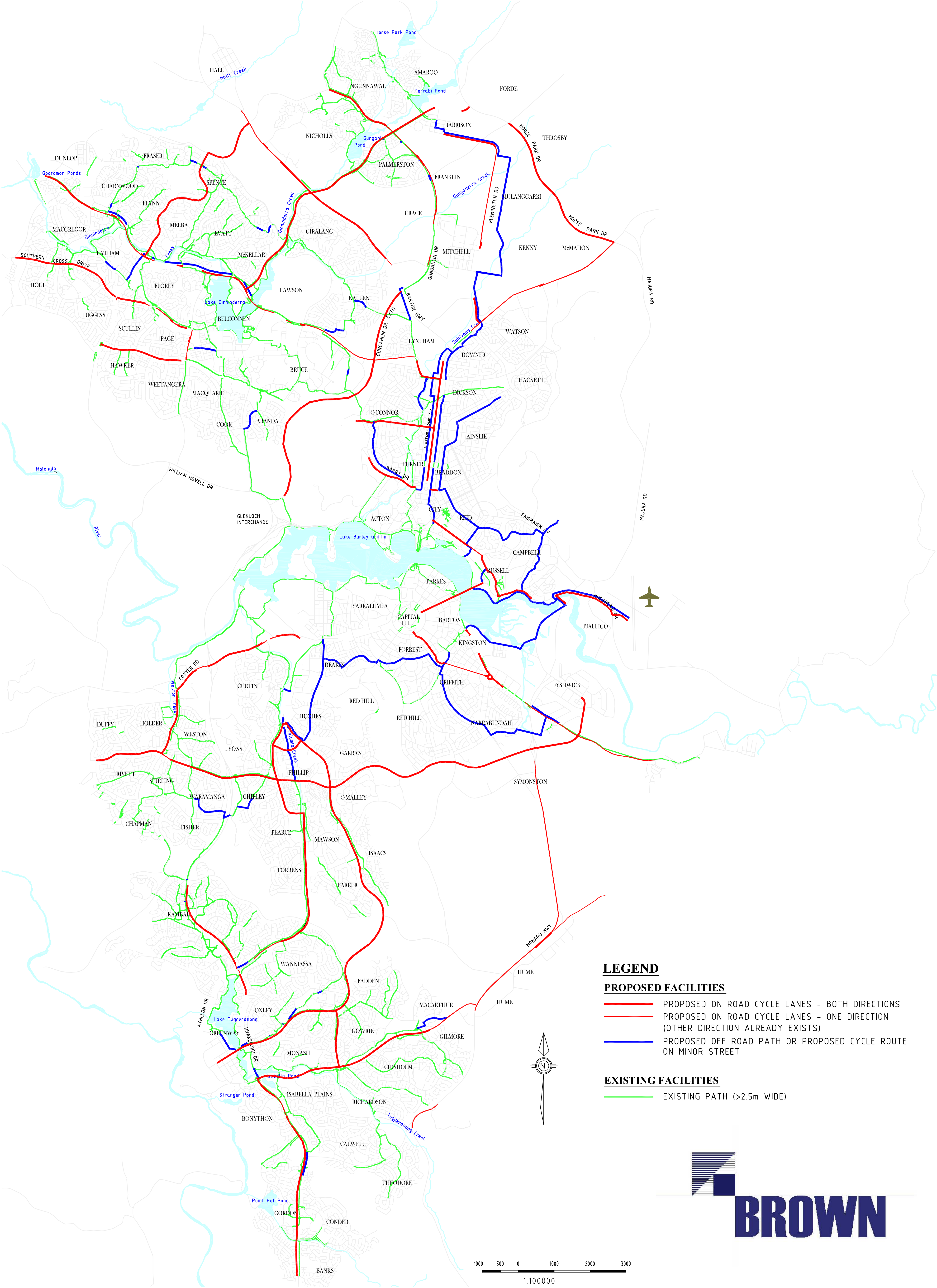
Roads ACT

URBAN SERVICES

TEN YEAR MASTER PLAN TRUNK CYCLING AND WALKING PATH INFRASTRUCTURE 2004 - 2014

actpla ACT PLANNING & LAND AUTHORITY

FIGURE 12 - PROPOSED CYCLE LANES AND SHARED PATHS



BROWN

H:\C03000\C03081\drawing\C03081Missing Links.dwg

APPENDIX A

Background Data

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Ref.	Title of Report/File	Date	Author or Consulting Firm	Client
1	Cycling Data and Indicator Guidelines	Nov-00	Steer Davies Gleave	Commonwealth Department of Health & Aged Care; Australian Bicycle Council
2	Cyclepath System for Canberra Stage 2 Part A Study	Aug-75	Department of Housing and Construction	The National Capital Development Commission
3	ACT Bicycle Policy Market Survey Research Report	Jul-91	Datacol	Dept of Urban Services, Roads and Transport Branch
4	Improving Bicycle Access and Parking Belconnen Town Centre	Sep-91	R.D. Gossip Pty Ltd	ACT Government
5	Cycleway Connections Kingston and Lyneham Design Report	Nov-91	Hughes Trueman Ludlow	
6	Land (Planning and Environment) Act 1991/Draft Variation to the Territory Plan/District of Gungahlin	Dec-91	ACT Planning Authority	
7	On Road Cycling in the ACT, Improving Facilities for the Safety and Encouragement of Commuter Cyclists Final Report	Feb-92	Arup Transportation Planning, Feilman Planning Consultants	ACT Department of Urban Services. Traffic and Roads Branch
8	ACT Cycling Strategy Plan Final Report	Jun-92	Arup Transportation Planning, Geoplan and Feilman Planning	ACT Department of Urban Services, City Services Group, Transport and Roads Branch
9	Harcourt Hill Report on Traffic Access	Jul-92	DJA - Denis Johnston & Associates	
10	Lyneham to Civic Cyclepath Improvements Study Interim Draft Report	Jul-92	R.D. Gossip Pty Ltd	Public Works and Services
11	Lyneham to Civic Cyclepath Improvements Study Final Report	Sep-92	R.D. Gossip Pty Ltd	Public Works and Services
12	Cycling Arterial Network ACT Gungahlin Masterplan Final Report	Sep-92	Arup Transportation Planning, Feilman Planning Consultants, Margules Groome Poyry	ACT Planning Authority
13	On-Street Cycle Route Traffic Investigations/City-Belconnen	Apr-93	Denis Johnston & Assoc	
14	On Road Cycling Belconnen to Civic Pre-Design Report	Apr-93	R.A.Young & Assoc	Public Works and Services
15	Final Preliminary Sketch Plan Report/City to Dickson Cyclepath Improvements	May-93	R.A.Young & Assoc	Public Works & Services
16	Woden Town Centre Bicycle Access and Facilities Improvements Study Final Report	May-93	R.D. Gossip Pty Ltd	Public Works and Services
17	Bicycling in the ACT- A survey of Bicycle Riding and Helmet wearing in 1992	Jul-93	Paul Ratcliffe, Stategy & Programs Unit Roads & Transport Branch	ACT Department of Urban Service. City Services
18	Final Sketch Plan Report/City to Dickson Cyclepath Improvements	Aug-93	R.A.Young & Assoc	Public Works & Services
19	The National Bicycle Strategy	Dec-93	Transport and Communications	
20	On Road Bicycle Facilities Soward Way-Erindale Drive, Parkes Way-Coranderrk Street- Constitution Avenue, Haydon Drive, College Street Pre Design Report	Jan-94	R.D. Gossip Pty Ltd	Public Works and Services
21	Off-Road Bicycle Facilities William Slim Drive, Owen Dixon Drive, Belconnen Preliminary Sketch Plan Report	Feb-94	R.D. Gossip Pty Ltd	Public Works and Services
22	Tuggeranong Town Centre Bicycle Facilities and Access Improvements Draft Report	Jul-94	R.D. Gossip Pty Ltd	Public Works and Services
23	Gungahlin and North Watson Bicycle Route Options Study Draft Report	Aug-94	R.D. Gossip Pty Ltd	Public Works and Services
24	1999-2004 Australian Cycling, The National Strategy	1999	AUSTROADS	
25	ACT Bicycle Volumes, Trends, Variations, Survey Results, Helmet Wearing and Cyclist's Characteristics 1991-1993/94	Sep-94	Road and Transport Branch Traffic & Roads Section Traffic Monitoring Unit	ACT Department of Urban Services. City Services
26	Bicycle Path Options Study/Gungahlin and North Watson to City	Nov-94	R.D. Gossip Pty Ltd	Public Works & Services/ACT Capital Works

Ref.	Title of Report/File	Date	Author or Consulting Firm	Client
27	ACT Bicycle Safety Study	Nov-94	Co-Communication Pty Ltd, Purdon Associates Pty Ltd	NRMA - ACT Road Safety Trust
28	Tuggeranong Town Centre Bicycle Facilities and Access Improvements Final Report	Dec-94	R.D. Gossip Pty Ltd	Public Works and Services, ACT Capital Works
29	Bicycle Path Options Study/Russell, Campbell Park, Jerrabomberra Wetlands Final Report	Jul-95	R.D. Gossip Pty Ltd	Works and Commercial Services Group, Construction and Maintenance Service Branch
30	Background Papers/Gungahlin Town Centre and Central Area	Aug-95	ACT Planning Authority	
31	On-Road Cycling Workshop Workshop notes	Nov-95	R.D. Gossip Pty Ltd	ACT Department of Urban Services. Traffic and Roads
32	Northern Canberra Community Path Assessment	Feb-97	Arup	Total Care Industries Limited
33	Infrastructure Policy, ACT Roads and Stormwater 2001/02 One and Three Year Capital Works Program	Jul-00	Department of Urban Services	
34	Parkes Way - Kings Avenue, Shared Pedestrian / Cyclist Grade Separation Final Report	Aug-01	R.D. Gossip Pty Ltd	Urban Services, ACT Procurement Solutions
35	2000-2001 Capital Works Construction Proposals/Lyneham/Belconnen Bicycle Facility Improvements	Mar-02	Department of Urban Services	
36	North Gungahlin Structure Plan Background Report	Oct-02	Planning and Land Management	
37	Community CrimePrevention Streetlighting Initative Strategic Planniong Study	Feb-03	Maunsell Australia	ACT Procurement Solutions
38	Woden to Dickson On Road Cycling - Stage 1B Adelaide Avenue, Yarra Glen Final Design Submission	Mar-03	R.D. Gossip Pty Ltd	Roads ACT
39	Final Design Report/Woden to Dickson On-Road Cycling/Stage 1B/Adelaide Av Yarraglen	Apr-03	R.D. Gossip Pty Ltd	Roads ACT
40	Final Design Report/Woden to Dickson On-Road Cycling/Stage 2B/Commonwealth Avenue(South), Capital Circle and State Circle Flynn Drive	May-03	R.D. Gossip Pty Ltd	Roads ACT
41	On Road Cycling Lanes - Review of Performance of Coloured Surface Materials	Aug-03	R.D. Gossip Pty Ltd	Roads ACT
42	City Bicycle Access Stage 2		R.D. Gossip Pty Ltd	ACT Public Works
43	"City Hill Link" - Civic Square Redevelopment Draft Report on Master Planning Investigations of The City Walk to City Hill Link		Ancher Mortlock and Woolley Pty Ltd/ Dorrough Britz & Associates	Major Projects Group ACT Office of Industry and Development
44	On Road Cycling Facility Strategy			
45	Ministerial Correspondence on Cycleway Complaints	to Nov-03		
46	Estimating the Economic Benefits of Bicycling and Bicycle Facilities: An Interpretive Review and Proposed Methods	Jan-04	Kevin J Krizek, University of Minnesota	TRB 2004 Annual Meeting
47	NSW Bicycle Guidelines	2003	Roads & Traffic Authority of NSW	
48	AUSTROADS Guide to Traffic Engineering Practice Part 14 - Bicycles	1999	AUSTROADS	
49	The Canberra Spatial Plan	Mar-03	ACTPLA	
50	The Draft Sustainable Transport Plan (DSTP)	Dec-03	ACTPLA & DUS	
51	Sustainable Transport Plan (STP)	Apr-04	ACTPLA & DUS	
52	Canberra Bicycle 2000 Strategy (www.act.gov.au/bikebits/bike_files/visi.htm)	Jun-00	ACTPLA	
53	Profitable Walking and Cycle Track Networks	2002	Kjartan Saelensminde, Nordic Road and Transport Reseach, Institude or	
54	Auckland Regional Cycling Strategy	May-02	Auckland Regional Council	Auckland Regional Council

Ref.	Title of Report/File	Date	Author or Consulting Firm	Client
	Electronic Documents/Data			
1	Bike Path Request Priority List	Oct-02	Roads ACT	Roads ACT
2	Strategy for New Footpaths	Oct-02	Roads ACT	Roads ACT
3	Footpath Request Priority List	Aug-03	Roads ACT	Roads ACT
4	Complaints under Primary Asset Type - Bicycle Facilities (new) from ACTRAMS database.	1999-2003	Roads ACT	Roads ACT
5	GIS 40m grided elevation data ACT		ACTPLA	ACTPLA
6	GIS Contours ACT		ACTPLA	ACTPLA
7	GIS 1m resolution images ACT		ACTPLA	ACTPLA
8	GIS District boundaries ACT		ACTPLA	ACTPLA
9	GIS Kerb layout		ACTPLA	ACTPLA
10	GIS Cyclepath/footpath locations		ACTPLA	ACTPLA
11	Pedal Power Capital Works database - www.pedalpower.org.au/events/capworks/intro.htm		Pedal Power	Pedal Power
12	2001 Census Journey to Work data		ABS	ACTPLA
13	Benefits of Walking - www.roadsafety.qld.gov.au/qt/LTASinfo.nsf/rs_pedestrians_benefitsofwalking.htm	Nov-03	Queensland Transport	
14	Why Encouarge Cycling - www.transport.qld.gov.au/qt/driver.nsf/index/cyc_health_benefits	Nov-01	Queensland Transport	

APPENDIX B

On Road Cycle Lane Survey

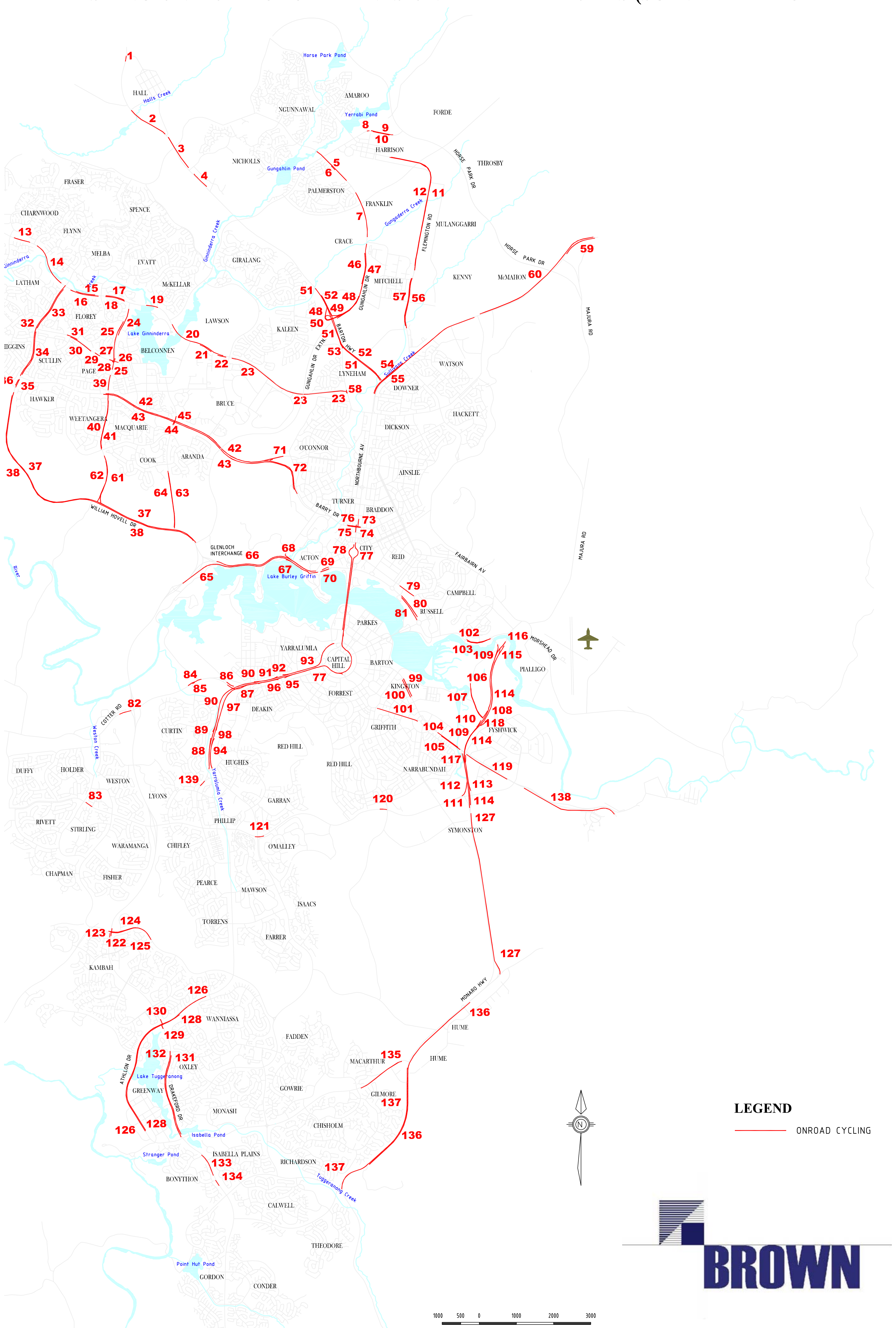
Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Roads ACT
URBAN SERVICES

TEN YEAR MASTER PLAN
TRUNK CYCLING AND
WALKING PATH INFRASTRUCTURE
2004 - 2014

actpla ACT PLANNING & LAND AUTHORITY

FIGURE Ax1: EXISTING ON-ROAD CYCLE LANES ON ARTERIAL ROADS (SURVEYED DECEMBER 2003)



H:\C03000\C03081\drawing\C03081cylelanes.dwg

Table B1: ACT ON-ROAD CYCLE LANE SURVEY - AUSTROADS PART 14 COMPLIANCE STATUS

(Note: A summary of compliance categories is shown in Table B2 below)

Cycle lane no.	Road name	Category	Length (m)
1	Barton Hwy (S/B)	2c(i)	154
2	Barton Hwy (S/B)	2a(i)	1,122
3	Barton Hwy (S/B)	2a(i)	989
4	Barton Hwy (S/B)	2a	483
5	Gunghalin Drive (S/B)	2a(i)	1,128
6	Gunghalin Drive (N/B)	2c(i)	152
7	Gunghalin Drive (N/B)	2a	1,254
8	Gundaroo Drive (E/B)	2f(i)	71
9	Gundaroo Drive (E/B)	1	602
10	Gundaroo Drive (W/B)	1	453
11	Flemington Road (S/B)	2d	3,853
12	Flemington Road (N/B)	2d	3,759
13	Ginninderra Drive (S/B)	2e	449
14	Ginninderra Drive (S/B)	2b(i)	1,234
15	Ginninderra Drive (S/B)	2e	527
16	Ginninderra Drive (N/B)	2c	777
17	Ginninderra Drive (S/B)	2f	516
18	Ginninderra Drive (N/B)	2c	533
19	Ginninderra Drive (S/B)	2c	321
20	Ginninderra Drive (S/B)	2a(i)	1,664
21	Ginninderra Drive (N/B)	2a	360
22	Ginninderra Drive (N/B)	2c	239
23	Ginninderra Drive (N/B)	2a	3,404
24	Coulter Drive (S/B)	2c	769
25	Coulter Drive (N/B)	2b	1,349
26	Coulter Drive (S/B)	1(i)	67
27	Southern Cross Drive	1(i)	256
28	Southern Cross Drive (W/B)	1(i)	63
29	Southern Cross Drive	2c	156
30	Southern Cross Drive (W/B)	2a	674
31	Southern Cross Drive (E/B)	2c	305
32	Kingsford Smith Drive (N/B)	2c	2,788
33	Kingsford Smith Drive (S/B)	2a(i)	1,264
34	Kingsford Smith Drive (S/B)	2a	1,253
35	Kingsford Smith Drive (S/B)	2c	247
36	Kingsford Smith Drive (N/B)	2c	179
37	William Hovell Drive (S/B)	2b(i)	7,600
38	William Hovell Drive (N/B)	2b(i)	7,431
39	Coulter Drive (N/B)	2a	413
40	Coulter Drive (N/B)	2a	1,539
41	Coulter Drive (S/B)	2a	1,300
42	Belconnen Way (E/B)	2b(i)	5,282
43	Belconnen Way (W/B)	2b(i)	6,124
44	Bindubi Street (N/B)	1	125
45	Bindubi Street (S/B)	1	226
46	Gunghalin Drive (N/B)	2a	848
47	Gunghalin Drive (S/B)	2b(i)	2,297
48	Gunghalin Drive (N/B)	2a(i)	1,381
49	Gunghalin Drive (N/B)	1	435
50	Gunghalin Drive off ramp	2a	911
51	Barton Hwy (N/B)	2a	3,114
52	Barton Hwy (S/B)	2a	2,874
53	Barton Hwy (N/B)	2c	224
54	Federal Hwy (N/B)	2a (i)	1,147
55	Federal Hwy (S/B)	2a	3,452
56	Flemington Road (S/B)	2b	1,365

Cycle lane no.	Road name	Category	Length (m)
57	Flemington Road (N/B)	2d	1,303
58	Mouat Street (N/B)	1	98
59	Federal Hwy (S/B)	2e	911
60	Federal Hwy (N/B)	2e(i)	3,791
61	Coulter Drive (S/B)	2b	1,426
62	Coulter Drive (N/B)	2b	1,140
63	Bindubi Street (S/B)	2b	1,504
64	Bindubi Street (N/B)	2a	1,531
65	Tuggeranong Parkway (S/B)	2b(i)	3,996
66	Parkes Way (E/B)	2b(i)	2,860
67	Parkes Way (W/B)	2c(i)	140
68	Parkes Way (E/B)	2c(i)	269
69	Parkes Way (E/B)	2c	198
70	**Shoulder Only**		
71	Macarthur Ave (W/B)	2c(i)	80
72	Barry Drive (S/B)	2b(i)	1,468
73	Federal Hwy (S/B)	1(i)	215
74	Federal Hwy (N/B)	1(i)	206
75	Barry Drive (W/B)	1	352
76	Barry Drive (E/B)	1(i)	371
77	Northbourne Avenue (S/B)	2b	5,473
78	Northbourne Avenue (N/B)	2b(i)	2,387
79	Constitution Avenue (N/B)	2a	476
80	Parkes Way (E/B)	2c	716
81	Parkes Way (W/B)	2e	738
82	Cotter Road (E/B)	2a	335
83	Hindmarsh Drive (E/B)	2c	211
84	Cotter Road (E/B)	2a(i)	405
85	Cotter Road (W/B)	2c	75
86	Cotter Road (E/B)	2e	228
87	Cotter Road (W/B)	2b	575
88	Yarra Glen (N/B)	1	843
89	Yarra Glen (N/B)	1	571
90	Yarra Glen (N/B)	2g	2,083
91	Adelaide Ave (N/B)	1	655
92	Adelaide Ave (N/B)	1	460
93	Adelaide Ave (N/B)	2b(i)	1,765
94	Yarra Glen (S/B)	1	833
95	Adelaide Ave (S/B)	1	545
96	Adelaide Ave (S/B)	2g	555
97	Yarra Glen (S/B)	2b	2,014
98	Yarra Glen (S/B)	2a	638
99	Wentworth Ave (S/B)	1	525
100	Wentworth Ave (N/B)	2c	522
101	Canberra Avenue (E/B)	2d	1,148
102	Morsehead Drive (E/B)	2b	585
103	Morsehead Drive (W/B)	2b	658
104	Canberra Avenue (E/B)	1	683
105	Canberra Avenue (W/B)	2b	630
106	Dairy Road (S/B)	2d	862
107	Dairy Road (N/B)	1	1,032
108	Monaro Hwy (N/B)	2c	216
109	Monaro Hwy (N/B)	2a	3,434
110	Monaro Hwy (N/B)	1	211
111	Monaro Hwy (N/B)	2a	1,480
112	Monaro Hwy (N/B)	2a	433
113	Monaro Hwy (S/B)	2c	235
114	Monaro Hwy (S/B)	2a(i)	4,594
115	Monaro Hwy (S/B)	1	170
116	Monaro Hwy (N/B)	2a(i)	493
117	Monaro Hwy (S/B)	2c	206
118	Monaro Hwy (S/B)	2c	157
119	Canberra Ave (W/B)	2a (i)	1,282
120	Hindmarsh Drive (E/B)	2c	194
121	Hindmarsh Drive (W/B)	1	243
122	Tuggeranong Parkway (S/B)	2c	211

Cycle lane no.	Road name	Category	Length (m)
123	Tuggeranong Parkway (N/B)	2c(i)	116
124	Sulwood Drive (E/B)	2a(i)	766
125	Sulwood Drive (W/B)	2a(i)	1,268
126	Athllon Drive (N/B)	2b(i)	4,782
127	Monaro Hwy (S/B)	2a	4,421
128	Athllon Drive (S/B)	2b(i)	3,863
129	Drakeford Drive (N/B)	1(i)	129
130	Drakeford Drive (S/B)	1(i)	175
131	Drakeford Drive (S/B)	2b	2,212
132	Drakeford Drive (N/B)	2d	2,404
133	Drakeford Drive (N/B)	2a	646
134	Drakeford Drive (N/B)	2c	178
135	Isabella Drive (S/B)	2a	1,324
136	Monaro Hwy (S/B)	2b(i)	5,428
137	Monaro Hwy (N/B)	2b	4,037
138	Canberra Ave (W/B)	2b(i)	2,651
139	Melrose Drive (N/B)	2g	178
		Total	**180,724**

Table B2: Summary of Compliance Categories (AUSTROADS Part 14)

Category	Description	Length (m)	% of Total
1	Cycle lane compliant to Austroads Part 14 - signs at max 500m interval and symbols at 200m max. Width conforming for posted speed zone	9,062	5
1(i)	Cycle lane compliant to Austroads Part 14 - signs at max 500m interval and symbols at 200m max. Width non - conforming for posted speed zone	1,482	1
2	Cycle lane non compliant to Austroads Part 14 - symbols or signs or both present but outside required spacing		
2a	Symbols present - non compliant; signs not present - width compliant	36,597	20
2a(i)	symbols present - non compliant; signs not present - width non compliant	17,503	10
2b	Symbols present - non compliant; signs present - non compliant - width compliant	22,968	13
2b(i)	Symbols present - non compliant; signs present - non compliant - width non compliant	59,168	33
2c	Symbols present - compliant; signs not present - width compliant	9,657	5
2c(i)	Symbols present - compliant; signs not present - width non compliant	911	1
2d	Symbols present - compliant; signs present non	13,329	7
2d(i)	Symbols present - compliant; signs present non compliant - width non compliant	-	0
2e	Symbols - not present; signs present - non compliant - width compliant	2,853	2
2e(i)	Symbols - not present; signs present - non compliant - width non compliant	3,791	2
2f	symbols - not present; signs present - compliant - width compliant	516	0
2f(i)	Symbols - not present; signs present - compliant - width non compliant	71	0
2g	Symbols present-non compliant; signs present compliant - width compliant	2,816	2
2g(i)	Symbols present-non compliant; signs present compliant - width non compliant		0
	TOTAL	**180,724**	**100%**

APPENDIX C

Summary of ACTRAMS Database Comments

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Summary of ACTRAMs Database Public Comments/Complaints

Roads ACT's "ACTRAMS" database records the date of the complaint, path location, extent of rectification works, estimated cost and a priority ranking. The priority system uses the following rankings:

1. high priority – meets ACTCODE criteria of 1,000 vehicles per day or ministerial direction
2. high priority – adjacent to medium density leases (ACTCODE criteria) and high pedestrian volumes, eg shops.
3. high priority - both side of the road for bus routes (ACTCODE criteria)
4. high safety risk – non standard paths including pram crossings
5. medium safety risk – access for the elderly, children at schools and the disabled
6. low safety risk – pedestrian/traffic conflict or high potential for slips and trips
7. continuity – worn paths in unpaved areas
8. others – not recommended for construction
9. construction completed

Comments/complaints with rankings of 1 to 5, and 7 and dated 1 January 2000 are reproduced below. Comments relating to maintenance work on existing paths are not included.

The table data has been sorted according to the above priority assigned by Roads ACT. Note that the following table records have been imported directly from the ACTRAMS database without further editing by Brown.

DATE	PATH LOCATION	Roads ACT RANKING
22/2/00	Phillip – Athllon Dr east side between Hindmarsh Dr and southbound bus stop.	1
23/2/00	Amaroo – In the Merrabei Dr verge between the walkway (Blks 10,11 Sec27) and the bus stop (check).	1
14/3/00	Weston – Streeton Dr, path along southbound carriageway leading from road shoulder commencing at Streeton Dr through to existing path at Cotter Road in amongst the trees.	1
30/3/00	Deakin/Forrest – Melbourne Ave, western side between Stonehaven Cres and Gawler St.	1

Summary of ACTRAMs Database Public Comments/Complaints

DATE	PATH LOCATION	Roads ACT RANKING
26/4/00	Page – Southern Cross Dr, southern side between Coulter Dr and Chewings St.	1
22/5/00	Gordon – Sid Barnes/Flegg Cres to Tharwa Dr bus stop via vacant block unleased land.	1
6/3/01	Red Hill – Carnegie Cres between Carey Gardens Driveway and La Perouse St intersection.	1
23/3/01	Campbell – Rosenthal St between Treloar Cres and Jackson St underpass.	1
30/4/01	Page – Southern Cross Dr, southern side, between Coulter Dr and Chewing St.	1
30/5/01	Page – Coulter Dr between Southern Cross Dr and Bavay Pl.	1
24/8/01 29/06/02	O'Malley – Culgoa Circuit from Tyagarah to Kareelah Vista.	1
15/10/02	Melba – Kingsford Smith Drive between No. 175 and Bainton Crescent (east)	1
7/11/02	Dunlop – missing link between cyclepath (near Kilburn Close) and Lance Hill Avenue.	1
31/1/00	Barton – Sydney Ave Blk 3 Section 30	2
14/3/00	Holder – Mulley St kerb crossing plus realigned connection between Mulley St underpass and Streeton Dr underpass.	2
19/2/02	Kambah Wyselaskie St - ACT Housing	2
1/5/02	Phillip, Butters Drive. Footpath and protective fence over underpass	2
26/9/02	Isaacs – path on Hansen Circuit from Dorsch St to start of loop. Minimum path from Dorsch St to first driveway for units	2
6/8/02	Conder – along floodway between Mewstead Mews and Box Hill Ave	2

Summary of ACTRAMs Database Public Comments/Complaints

DATE	PATH LOCATION	Roads ACT RANKING
27/03/03	Waramanga – Missing path 12-24 Damala Street	2
08/05/03	Reid – Gooreen St, Ainslie Ave to Allambee St	2
16/04/03	Red Hill – 163-173 Monaro Cres	2
9/2/00	Belconnen – Emu Bank/Luxton St intersection, carpark side PC requirement for disabled access. Belconnen – Path along Emu Bank between Luxton St and Beissel St.	3
27/4/01	Mawson – Beasley St, northside between bus stop in front of No. 191 and the intersection of Athllon Dr and Beasley St.	3
27/4/01	Fyshwick – Gladstone St, southside, pine plantation beside No. 114-116 (not required due to proposed new driveway). Other missing paths opposite side of Gladstone St and further down.	3
7/9/01	Higgins – path from school to bus stop. Path from bus stop to Nicholls Pl	3
11/9/01	Campbell, path at school on the corner of Creswell St and Blamey Crescent	3
24/9/01	Gilmore – path in Louis Lawson Cres	3
16/10/01	Latham, Ginninderra Drive/Florey Drive -on road cycling to Dunlop.	3
7/11/01	Waramanga – path on Yambina Cres from Nemarang Cres to Ambara Court	3
15/2/02	Watson Crn Phillip Av and Northbourne Ave	3
19/2/02	Lyneham Corio Villa Court Fairweather Crt and Cossington Smith Cr. Ministerial	3
24/5/02	Campbell, 118 Vasey Crescent - path from bus stop around a tree to existing path	3

Summary of ACTRAMs Database Public Comments/Complaints

DATE	PATH LOCATION	Roads ACT RANKING
17/4/02	Curtin – Footpath - in corridor between sealed walking trail to west of Dunstan St through to Throssell St. Consider path from Dunstan to Dooley for bus use.	3
26/11/02	Garran – Kitchener Street and Gilmore Crescent	3
16/04/03	Ngunnawal – Galmarra Street	3
17/8/01	Woden/Civic cyclepath – requires a design review for southside cyclepaths. Roads ACT committed to 02/03 CWP bid	4
18/2/02	Narrabunda Nyrang St	4
14/5/02	Melba, Boult Place to shops. Extension of existing path through mulched area to carpark	4
14/6/02	Narrabunda Nyrang St	4
15/4/02	Griffith, Lockyer Street and Barrallier St. Pram crossings needed at intersections	4
29/05/03	Banks – To establish a laneway/footpath next to 11 Adcock Place	4
16/04/03	Red Hill – 3 & 5 Espereance St.	4
30/6/00	Lawson – Lake Ginninderra Bridge (northside, guardrail bike path safety barriers.	5
30/6/00	Lawson– Lake Ginninderra west side, underneath, bike path vehicle barriers.	5
7/9/00	Monash – Rear of Goodwin Retirement Village	5
8/12/00	Palmerston – Tiptree St and Kosciusko Ave paths including playground area.	5
28/11/00	Holt – Chave St Moyes Cres.	5
14/2/01	Hughes – Wark St between Groom St and Carroll St, east side.	5

Summary of ACTRAMs Database Public Comments/Complaints

DATE	PATH LOCATION	Roads ACT RANKING
20/2/01	Red Hill – Monaro Cres between parkland and Astrolabe St	5
21/2/01	Campbell – Chauvel St, northside between Vasey Cres and Gellibrand Cres.	5
11/4/01	Bruce – Corner of Haydon Dr and Purdie St between bike path and back of Purdie St kerb.	5
24/4/01	Macquarie – Blackman St between walkway beside No. 53 and Lochbuy St (south).	5
17/8/01	Ainslie – Chisholm Street (southern side) from Hayley Street to Duffy Street	5
17/9/01	Fraser, cyclepath along Kuringa Drive	5
6/3/02	Watson Irvine St.- Simpson St to Piddington St	5
24/5/02	Acton, corner of Ellery Cr and McCoy CCT	5
31/5/02	Watson – A'Beckett St between Innes St and Mc Cawley St and Innes St between Phillip Ave and A'Beckett St. Missing path	5
3/6/02	Macarthur, Falkiner Place	5
31/5/02	Duffy – widen path between Somerset Street and Jemalong Street. Existing path is too close to overhanging bushes. Diagonal?	5
20/8/02	Red Hill – path between Monaro Crescent and Hicks Street.	5
27/9/02	Kambah – 12 Kett Street	5
26/11/02	Deakin- between the shop carpark and the back of the Grange	5
16/04/03	Aranda – Cnr Eastern Valley Way & Bindubi Street	5
16/04/03	McKellar – Haverfield Place	5
16/04/03	Fyshwick – Tennant St.	5

Summary of ACTRAMs Database Public Comments/Complaints

DATE	PATH LOCATION	Roads ACT RANKING
16/04/03	O'Connor – Wetlands to Shops	5
20/10/03	Mildura Street- from the lights (near CIT) Narrabundah side through to the Fyshwick markets.	5
29/8/00	Kambah – Kambah Pool road - Path along worn track between southside bus stop and pedestrian spine.	7
29/8/00	Kambah Pathway to Mt Vernon Dr and beyond toKambah Pool itself.–	7
1/3/01	Kambah – Kambah Pool Rd between Bus Stop (northside of road) and Namatjira Dr.	7
21/6/01	Garran – Dennis St northside between Palmer St and Neilson St. Input to Min brief by Nuriye Kece for discussions between Min and Garran Comm Assoc.	7
5/9/01	Amaroo missing connection to bike path on Mirabei Drive near bridge	7
21/2/02	Evatt 20 Levine Street	7
5/3/02	Campbell 94 Vasey Cres	7
27/8/02	Bruce – Mugglestone Place	7
16/9/02	Campbell – path on Waller Crescent from No 61 to White Crescent.	7
26/11/02	Gordon – near cyclepath behind Chevalley loop	7
16/04/03	Narrabundah – Finniss St, from Spront to Spront	7

APPENDIX D

Summary of Public Complaints

(including Correspondence to Minister)

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Summary of Ministerial Correspondence and Roads ACT Comments/Complaints

A summary of the issues raised by Ministerial correspondence and correspondence directly with Roads ACT is shown in the following table. Maintenance issues have not been listed.

The table data has been sorted in reverse chronological order.

DATE	ISSUE
25/9/03	Provide on road cycling on Kings Highway within the ACT.
19/6/03	Provide cycle path along Kambah Pool Road from Barritt Street to Mount Vernon Drive.
29/4/03	Squeeze point along Lanyon drive at railway bridge. No cycling facilities or shoulder.
22/4/03	Squeeze point along Lanyon drive at railway bridge. No cycling facilities or shoulder.
4/3/03	Squeeze point along Lanyon drive at railway bridge. No cycling facilities or shoulder.
25/3/03	Cycle path from roundabout on Gundaroo Dr/Mirrabei Dr through to Yerrabi Estate Cycle path along Gundaroo Dr down to Gungahlin Town Centre
21/3/03	Cycle path along Sulwood Drive between Tuggeranong Parkway and Athllon Drive connecting existing off road cycle paths.
18/3/03	On road cycle lane from Wanniassa to Barton using Adelaide Avenue. No direct routes from Kambah to Civic or within the inner north suburbs.
3/3/03	Cyclepath to connect Barraclough Avenue cyclepath with Cockroft Avenue cyclepath.
27/2/03	Extend cyclepath from along Parkes Way where the city bound emergency lane ends before Commonwealth Ave Bridge through the tunnel.
25/2/03	Squeeze point along Lanyon drive at railway bridge. No cycling facilities or shoulder.
20/2/03	Require underpass under Ashley Drive at intersection with Erindale Drive
4/2/03	Cycle path along Sulwood Drive between Tuggernong Parkway and Athllon Drive connecting existing off road cycle paths.
16/1/03	Hackett to Parliamentary Triangle. No bike paths along direct route using Majura Avenue, Limestone Avenue, Anzac Parade to Kings Avenue Bridge. Require a cycle path to service the inner north (Watson, Downer, Dickson, Ainslie and Hackett).
25/11/02	Spence to City. Off road cycle path along Owen Dixon Drive (Evatt and Spence).

Summary of Ministerial Correspondence and Roads ACT Comments/Complaints

DATE	ISSUE
5/11/02	On-Road Cycle lane along Tharwa Drive from Banks to Tharwa
28/10/02	Cycle path along Owen Dixon Drive adjacent to Evatt and Spence.
25/10/02	Complete footpath/cyclepath around Yerrabei Pond.
23/10/03	Connection of off-road cycling along Gundaroo Dr at Anthony Rolfe Drive to on road cycling at Yerrabei Estate (Gundaroo Drive/Gozzard St).
20/10/02	On-Road Cycle lane along Tharwa Drive from Banks to Tharwa
6/5/02	On-Road Cycle lane along Tharwa Drive from Banks to Tharwa
20/3/02	Cycle path connection between Jerrabomberra Ave and Monaro Highway.
8/3/02	Squeeze point on Fairbairn Avenue at overpass at Jackson Street. Construct new path from Rosenthal Stret along Fairbain Avenue as shown as proposed on Canberra Cycleways map
8/11/01	On Road cycling facilities from Point Hut to Tharwa and Tharwa Drive
22/10/01	Construct off road path along Erindale Drive from Fadden to Isaacs.

APPENDIX E

Pedal Power Submission

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Cycling and Walking Infrastructure Master Plan Submission

This is Pedal Power ACT's submission to the Cycling and Walking Infrastructure Master Plan. Given the resources involved in estimating capital works costs, we have not fully estimated our suggested capital works program. Upon further discussion, we may revise our suggestions.

EXECUTIVE SUMMARY

- The ACT Government has targeted a 161% increase in cycling as a percentage of work trips between the years 2001 and 2011. A Cycling Master Plan is needed to achieve this.

- There is big potential for cycling, Pedal Power estimates that around 35-40% of car trips in Canberra are less than five kilometres – a distance many people can cycle.

- A Master Plan which sets out an appropriate cycling network and emphasises priority, directness and safety will help overcome the two major physical reasons why people don't cycle – trip times and fear of traffic.

- Cycling will generally be used for trips between 500 metres and 5 kilometres. However providing for longer trips (to and from work) and for training/racing cyclists is important.

- Cycle lanes are a very cheap and effective means of increasing cycle safety and decreasing trip times. However to meet the Government's ambitious goals, cycle lanes will not be enough because many people feel uncomfortable cycling on arterial roads, even with cycle lanes. For this reason it will also be important to build separate paths in high volume/high speed situations, largely around the major destinations where cycle paths end suddenly.

- Physical separation of cars and bicycles does not have to be achieved entirely by off-road paths. 'False kerbs' can be used to provide separation on-road.

- Cycle paths must be built to the same standard (priority, directness etc) as an adjacent road, so cyclists have little reason to use the road.

- The aim of this study is to establish trunk routes. These routes should then be brought up to the 'regional' routes standard of the NSW Bicycle Guidelines.

- We suggest trunk routes should be the routes between Canberra's major destinations. In addition, we suggest that quiet parallel street routes and bike paths within 3 kilometres of the major destinations (and within 5 kilometres of Civic) be designated trunk routes.

- We suggest a two pronged capital works program comprising (a) fixing the major missing links around Canberra identified by Pedal Power and (b) a rolling region by region program that brings each region's trunk routes up to the standard of the NSW Bicycle Guidelines.

- The current policy of building on-road lanes on Canberra's arterial roads when they are built or resealed should be continued. In addition, cycle lanes should be painted on collector streets when they are resealed.

BACKGROUND

Who is Pedal Power ACT?

Pedal Power ACT is a Canberra–based community organisation. Its mission is 'more Canberrans cycling, more often, for a better community'. It achieves this largely by running cycle rides and advocating for cycling improvements. It has over 1600 members and was founded in 1974.

A 161% increase in cycling work trips is targeted

Pedal Power commends the commissioning of a cycling and walking Master Plan. A well thought-out Plan is essential if capital works are to be prioritised and built which will increase cycling. This is important given the Government's Draft Sustainable Transport Plan has adopted a target of increasing cycling as a percentage of work trips from 2.3% in 2001 to 6.0% in 2011. This is a 161% increase. In absolute terms the percentage increase in cycling trips is even higher because Canberra's population (and the number of trips made) will grow over time. Precise targets have not been set for non-work trips because of a lack of reliable base data.

There is plenty of potential to increase cycling. Pedal Power estimates that around 35-40% of car trips in Canberra are for less than 5 kilometres – a distance many people can cycle. This is based on:

- The 1997 Canberra Queanbeyan Travel Survey found that 22% of *all* trips are for less than 3 kilometres and 55% of trips are for less than 8 kilometres[1].
- In Sydney the NSW Department of Planning has estimated 33% of *car* trips are less than 3 kilometres and 55% are for less than 5 kilometres[2].
- The research firm, Socialdata, amalgamated surveys of five different Perth local government areas to create a composite Perth figure and found that 10% of car-as-driver tips were for less than 1 km, 32% were less than 3km and 48% were for less than 5km[3]. Even in Joondalup, an outer metropolitan area, 38% of car-as-driver trips were still less than 5km[4]. The Draft Sustainable Transport Plan indicates that Canberra's population density is similar to Perth.
- Werner Brog, managing director of Socialdata, which conducts travel surveys around the developed world, notes a 10% less than 1km, 30% less than 3km and 50% less than 5km rule for car trips appears to hold true across all European and US cities.

How can the Master Plan get more people cycling?

Assuming that around 35-40% of car trips in Canberra are less than 5 kilometres (a distance many people can cycle) the question remains why don't people in Canberra cycle more? There are two major physical reasons why people don't cycle.

- Cycle trip time. This is more important than trip length. Trip length helps determine trip time but it is not the only factor. Cycle trip times are lengthened when cycle routes are circuitous rather than direct, take hills rather than a flatter route and involve frequent loss of right of way, particularly in Canberra where cycle paths often cross streets.

---

[1] Data provided by ACTPLA.
[2] NSW Department of Transport, *Integrated Transport Strategy for the Greater Metropolitan Region*, 1995.
[3] Socialdata, *Potential Analysis "Perth" Report*, December 2000, p15.
[4] Socialdata for Department of Planning and Infrastructure, WA, *How Joondalup Residents Travel: Findings of the 2000 City of Joondalup Travel Survey*, April 2002, p20.

- Fear of traffic and accidents. Although the actual risk of an accident is much less than generally perceived, *the perception is the reality* when it comes to what stops people cycling. Fear of traffic is the major factor explaining why in Australia, women (who are generally more risk averse than men) cycle less than men. This is contrary to European countries such as Holland and Germany where women cycle more than men[5].

A Master Plan which sets out an appropriate cycling network and emphasizes the importance of priority, directness and safety will help overcome the issues of trip time and fear of traffic.

(Other physical factors that affect cycling usage include end of trip and beginning of trip facilities and trip purpose. There are also subjective factors such as: lack of information, misinformation and lack of motivation; force of habit; and the status attached to cycling. TravelSmart programs in Perth have consistently increased cycling by around 50%[6] and show how important subjective factors are in transport choices. These programs have not changed the physical environment but have worked by simply giving information and motivation to those who are interested in alternatives to the car.)

BICYCLE NETWORK ISSUES

What is a Trunk Route?

The focus of the study will be on trunk routes. We note these are defined as high demand routes, not necessarily long distance routes. We agree with the emphasis on high demand routes. For instance we think the Sullivan's Creek bike path (ANU to Dickson) should be a trunk route because it is one of the most heavily used paths in Canberra, however it is only around 5 kilometres long.

Role of cycling in transport

To help choose priorities for cycling it is necessary to define a role for cycling in Canberra's transport system. We see cycling as providing transport generally for trips between 500 metres and 5 kilometres. For cycle trips of this distance, trip times are not much longer, and often shorter, than driving times, especially when traffic congestion, car parking and walking times from car parks are taken into account.

Over longer distances, the proportion of cycling trips decrease. Even in Denmark, which has one of the highest rates for cycling in the developed world, the bulk of cycle trips are for less than five kilometres[7].

Longer trips are undertaken, especially for regular journeys such as to work (where there are appropriate end-trip change rooms etc) and by training/racing cyclists. Given the target of increasing work trips by bicycle, providing for long trips is important. As Canberra is the home of the Australian Institute of Sport and the ACT Academy of Sport, providing for training/racing cyclists is also important. Canberra's large cycle racing fraternity has produced world class

---

[5] Garrard J, 'Healthy Revolutions: promoting cycling among women' in *Health Promotion Journal of Australia*, 2003, 14:213-215. See also Bicycle Victoria, April 2003, *Ride to Work and Beyond: Focus Group Research Report* for the Australian Greenhouse Office, Travel Demand Management Program, and the Victorian Department of Infrastructure (TravelSMART). (See www.bv.com.au.)

[6] Colin Ashton-Graham, manager of the Travel Demand Management Team (ie TravelSmart programs), Department of Planning and Infrastructure, WA at the Connecting Cycling Conference, Canberra, 20-21st November 2003.

[7] Danish Ministry of Transport (1993) *The Bicycle in Denmark*.

cyclists.

Separation and integration - cycle lanes and cycle paths

To reduce the fear of accidents, which stops many people cycling, the importance of traffic volumes and speed in determining cycle safety and perceptions of safety must be acknowledged. On-road cycle lanes separate cyclists and motorists, decrease travel time for both modes and increase cycling safety. They increase cycling (see Attachment One). The 1992 report 'On-Road Cycling In The ACT' noted that, on a per kilometre basis, cycle lanes cost about one tenth of an off-road path[8]. This is particularly when, as is often the case in Canberra, roads are wide enough to make a cycle lane within Austroads standards without road widening and line marking can be done as part of routine resealing. In these circumstances, even a modest increase in cycling, together with the increase in safety that results, justifies creating on-road lanes on a cost/benefit basis.

While on-road cycle lanes increase cycling and cycle safety at a very low cost, it needs to be recognised that a great many people will still feel uncomfortable riding on arterial roads. Recent NSW Bicycle Guidelines suggest that at speeds of over 60km/h and traffic volumes of over 5000 vehicles per day cycling should be provided for with separated cycle paths[9]. The Dutch engineering guidelines (known as CROW guidelines) are even more conservative in their assumption of what is needed to make cyclists feel safe. They suggest that at speeds of over 60km/h and traffic volumes of only 2000 vehicles a day separate cycle paths are needed[10].

Physical separation does not have to be achieved entirely by off-road paths. Simple separation measures such as kerbing laid directly onto existing road surfaces, physically separates cars and bicycles on-road. This is cheaper than off-road paths and provides reassuring separation for less confident cyclists. See page 28 of the NSW Bicycle Guidelines for details on 'false kerbs'.

It is important that new (or upgraded) cycle paths be built to at least the same standard (priority, connections, directness, surface quality, gradient and lighting) as the adjacent road, so that a cyclist would have few reasons to want to use the road instead. Unfortunately, many of our current cycle paths are built to such a low standard (especially in terms of priority, directness, alignment, width and condition) that many people only use the paths for recreation, finding them (amongst other things), too time-consuming for commuting.

In summary, on-road cycle lanes on Canberra's arterial roads should continue to be provided because they are very good value - they can increase cycle safety and cycling at a very low cost, especially when done as part of resealing. However if the ambitious goals of the Transport Plan are to be attained, providing on–road cycle lanes will not be enough. Provision of high priority separated paths on high speed/traffic volume routes – largely around major destinations where cycle paths end suddenly - will be also needed based on the NSW/CROW guidelines.

The 'Last Link'

A major problem with cycling in Canberra is the lack of provision for cyclists for the last kilometre, or in many cases, simply last the 500 metres close to major destinations, such as the

---

[8] Arup Transportation Planning and Feliman Planning Consultants (1992) *On-road Cycling in the ACT.*
[9] Roads and Traffic Authority (2004), *NSW Bicycle Guidelines*, p13.
[10] CROW (1993) *Sign up for the bike: design manual for a cycle-friendly infrastructure*, Ede, The Netherlands. These guidelines are excellently discussed in Godefroooij, T, 'Chapter 36: Segregation or integration of cycling in the road system: the Dutch approach' in Tilley R, 2003, *Sustainable Transport :Planning for Walking and Cycling in Urban Environments*.

major town centres. This is where space is at a premium and, in the past, planners and engineers have given up on providing space for cyclists. However it is vitally important if people are to be encouraged to cycle more. Less confident cyclists will be deterred if there is an off-road path/quiet route most of the way to their destination but it stops short 500 metres from the destination and they have to ride on a busy road with no cycle lane. While experienced and hardy cyclists can handle this, many people simply won't cycle because the last 500 metres deters them.

This happens to a greater or lesser extent at all of Canberra's town centres, which are often surrounded by four or six lane arterial roads and there is limited cycling provision through, or around the centre.

Canberra's current cycling facilities are either on-road cycle lanes or totally separated cycle paths. To provide for cycling in the confined space of Canberra's town centres, we suggest where appropriate, cycle paths be provided on-road with separation being achieved by the use of 'false kerbs' (as discussed above). Another option in newer developments where the verge between building and kerb is bigger, and there are few driveways, is to provide a path in this verge.

Improving the 'last link' for cyclists can be part of 'pedestrianisation' programs. Pedestrianisation programs, which decrease traffic speed and volumes in urban centres, are being increasingly undertaken around the world to make a more attractive environment for walking and cycling. Pedestrianisation programs will be needed to increase walking in Canberra's town centres, which are generally oriented towards driving a car and against walking.

Lower traffic speeds in neighbourhood areas

Given the fear of traffic that deters people from cycling, Pedal Power has strongly supported a 50km/h speed limit for all streets in neighbourhood and shopping areas. This is important given that cycling is well-suited to short trips around the local area. Also trips on neighbourhood and shopping streets often occur at the beginning and end of trips that involve trunk routes. Lower traffic speeds help solve the 'last link' problem. As discussed below, lower traffic speeds can be effectively combined with cycle lanes.

Collector and local cycle routes

To increase cycling it is important to recognise that cycling is perfect for short trips down to the local shops, schools, church, swimming pool, club etc. For this reason cycling conditions on local, and particularly collector streets where traffic volumes and speeds start to build up, are important. 85^{th} percentile traffic speeds on Canberra's residential collector streets are generally around 60km/h or greater. In these situations both the NSW and CROW guidelines recommend cycle lanes should be provided (and cycle paths if traffic volumes are high enough). For this reason we believe cycle lanes should be painted on all of Canberra's residential collector streets as they are resealed.

Painting cycle lanes on existing roads (particularly residential collector streets) narrows the road space for cars and hence reduces traffic speeds. Cycle lanes can then be combined with reduced speed limits of 50km/h or less to provide a more attractive cycling, walking and residential environment.

Cycling conditions on collector streets are also important because they feed into the trunk cycle routes, particularly on-road routes.

Old Grid Canberra and New Spaghetti Canberra

To understand and improve cycling in Canberra it is important to recognise the two types of town planning in Canberra. In the older Inner North and South town plans are based more on grid patterns. These town plans are more amenable to the use of quieter parallel streets for cycling routes. A good example of this is Sherbrooke St in Ainslie (800 vehicles per day), which parallels Majura Ave (8000 vehicles per day). Direct routes can be used for rat running. However, any direct routes can easily and cheaply be turned into safe cycling and pedestrian routes by strategic 'cul-de-sac-ing' that eliminates motor vehicle traffic without hindering walking or cycling.

The rest of Canberra is largely built on town plans built around cul-de-sacs and curves. Quieter parallel streets are harder to find. The street pattern is less legible and walkers and cyclists are forced onto main roads for many trips.

To increase cycling and walking in new developments it is important these incorporate planning principles that make walking and cycling trips safe and easy to do.

Design principles

The recently released NSW Bicycle Guidelines provide more detail than exists in Austroads Part 14. We haven't evaluated all the guidelines but we strongly endorse a number of elements they discuss, in particular:

- Principles of bicycle network design (p10). We particularly note the importance of coherence, which is consistent with one of the aims of this study, to fill-in the missing links.
- Giving trunk[11] cycle routes priority over minor streets at intersections. This decreases trip times and makes cycling more attractive. The Guidelines also suggest a number of methods of achieving this priority.

Priority

To reduce trip times and encourage cycling it is important to give trunk cycling routes priority. Other priority measures that should be investigated include:

- Giving walkers and cyclists priority at traffic lights.
- Having pedestrian light crossings at intersections automatically default to green whenever there are no conflicting traffic movements (to save a cyclist or pedestrian who reaches the button one second too late from having to wait an entire cycle to cross).
- Changing the 'cyclists must dismount at pedestrian crossing' rule to allow cyclists to cycle across at walking pace. The current rule, if it were obeyed, adds minutes to cycling trips. However, it is much more honoured in the breach than in the observance.
- Providing cyclist boxes in front of the motor vehicle stop line at traffic signals. This makes right turns easier.

A SUGGESTED NETWORK

The objective of this study is to design a trunk network. Once this has been decided then works can be prioritised and chosen that will bring the network up to standard. We believe that the

[11] The NSW Bicycle Guidelines use the term 'regional' routes instead of trunk routes.

ultimate aim should be to provide trunk routes to the same standard as the regional routes standard set out in the NSW Bicycle Guidelines.

In suggesting a network, we note that we can't demolish Canberra and start again. For this reason our suggested trunk routes are based on working from what is currently provided.

We have suggested trunk routes based on routes that connect or go through the major destinations of:

- the town centres (including Weston Creek and Queanbeyan)
- Russell/Barton/Parkes, Fyshwick and the airport (which are major centres of employment)
- the Australian National University and University of Canberra.

We recommend that these trunk routes should be assigned the same status as arterial roads i.e. they should have priority over collector and local streets. We think this is necessary to decrease trip times and achieve the 161% increase in cycling work trips that has been targeted. We believe the trunk cycling routes should include

- The major arterial road routes connecting the major destinations that are within 10 kilometres of each other. On-road lanes can cater for most of these trunk routes. However, where there is an off-road path that runs parallel to the road, it can be given appropriate priority and treatment to bring it up to a trunk route standard. In the cases of Belconnen and Gungahlin where there are two existing routes connecting them to Civic that need relatively minor work to bring them up to the trunk route standard we have chosen both routes.

- The major bike paths between the major destinations.

- As a rule of thumb we suggest all cycle paths within 3 kms (as the crow flies) of a major destination (and 5 kms of Civic - given that it is Canberra's centre) should be designated trunk routes. This recognises that cycling is particularly attractive for shorter trips and as the distance from major destinations decreases cycle traffic should increase (as long as it is appropriately provided for). Given that many of the cycle paths near town centres, apart from Civic, have underpasses where they meet roads, this decreases potential priority conflicts.

- The bike path around Lake Burley Griffin. This is an important commuter route and has considerable tourist potential.

- In the Inner North and Inner South, where there are few bike paths and more quiet parallel streets we suggest some routes into Civic, the ANU, Barton and Kingston that utilise quieter streets.
  Inner North
  - Madigan/ Hannan/Sherbrooke/Angas/Torrens (for Hackett/Ainslie/Dickson/Watson residents into Civic)
  - Moore St and Mort St (parallel Northbourne Ave routes)
  - Blamey/Currong St (for Campbell/Reid into Civic)
  - Westgarth/Hart St or Dryandra/Nicholson (from ANU to Belconnen/Civic cycle path)
  Inner South
  - Sydney/New South Wales/Currie/Leichhardt (fairly direct routes connecting West Fyshwick, Kingston and Barton)
  - Dominion/New South Wales/Macquarie

- Un-named service road parallel and East of Sturt Ave/Jerrabomberra Ave from McMillan Cr almost to Hindmarsh Dr

The attached map details our suggested routes

PRIORITIES

Below we set out a suggested 10 year works program. Given our limited resources we have not fully costed all our proposals and are willing to revise them upon further discussion. We suggest that the 10 year capital works program should be composed of two programs which should be undertaken concurrently.

A one-off capital works program

This program should focus on the most important missing links that Pedal Power members have identified across Canberra. They should result in a good benefit/cost payoff in terms of getting more Canberrans cycling. These are listed in the attached list of Pedal Power's Top 12 missing links. We expect that this program should be completed in the first two or three years of the Master Plan works.

A region by region rolling capital works program

We suggest that for each area in Canberra a detailed plan should be established to bring the trunk routes up to the standard in the NSW Bicycle Guidelines. The works would cover, but not be limited to:

- Ensuring routes are continuous
- Giving routes the appropriate priority over side streets and collector streets
- Providing separated paths (possibly via false kerbs etc)/cycle lanes where warranted, particularly close to town centres where the cycle paths currently end
- Ensuring continuity of cycle lanes through intersections
- Changing traffic light priorities as appropriate
- Providing pram ramps to connect between on and off-road paths
- Designating collector routes, and carrying out the minor works required on collector routes in the region

The program would work on a region-by region basis. On average, each region should be covered in two years. Six months should be allowed for a saddle survey and planning and 18 months for construction. We suggest the first region be Civic where there is already a high number of cyclists. Improving cycling infrastructure will further increase cycling numbers and provide a demonstration effect. We also understand that a new plan for Civic is likely to be developed in the near future. Planning should be carried out for one region while previous capital works is going on so there is on-going capital works.

We suggest that after Civic, works be carried out in priority order from the older parts of Canberra to the new ie Inner South, then Woden/Weston Creek, Belconnen, Tuggeranong and Gungahlin.

Cycle lanes as part of new work/resealing

In addition to the two-pronged capital works program set out above we suggest that the ACT:

- continues with its policy of marking on-road cycle lanes on arterial roads when they are built or resealed (if the roads are wide enough). As discussed above, this is very cheap way to increase cycling numbers and safety.

- marks cycle lanes on residential collector streets when they are resealed (if the roads are wide enough). The 85th percentile speed on Canberra's collector streets is generally around 60km/h or greater. NSW and CROW guidelines both recommend cycle lanes or cycle paths in these situations. The marking of cycle lanes can be incorporated with lower speed limits on these streets, which further improves safety and the attractiveness of cycling.

Cycle lanes marked on these streets may be not necessarily be part of the trunk cycle route network but will still form an important collector network needed to 'feed' the trunk routes and encourage cycling for the short trips which are well-suited to cycling.

ATTACHMENT 1 – CYCLE LANES INCREASE CYCLING

Attachment 1 is a graph that we have been unable to reproduce in the electronic version of our comments on the Master Plan. The graph has been attached to the printed version we have submitted. The graph shows that bike lanes have increased cycling on the major approaches to Melbourne's CBD. The graph can be found at http://www.bv.com.au/download/ACFB71.pdf

ATTACHMENT 2 - PEDAL POWER'S TOP 12 MISSING CYCLE LINKS
That will get more Canberrans cycling, more often

The list below highlights what we think are the major one-off projects that can be completed and offer a high benefit-cost ratio. Completing these projects should be done in conjunction with a region by region program to bring the identified trunk routes up to standard

Costings are only in order of magnitude rather than precise estimates because of the difficulties in costing due to underground utilities, variation in contractors' rates etc. Projects are listed in priority order.

1. Underpass on Parkes Way near Russell roundabout and associated path links
Comment - Has been on agenda for several years to allow cyclists to reach Defence and Constitution Ave, without having to negotiate Russell Roundabout. Defence, NCA and the ACT Government have reached agreement to fund this project. The ACT Government contribution is estimated at $300,000 towards total cost of $800,000 (rest funded by NCA and Defence).

2. Cycle lanes Barry Drive, Firth St to Marcus Clarke St (1.5km)
Comment - final unfunded section between current cycle lanes on Belconnen Way and the cycle lanes on Barry Drive east from Marcus Clarke St. Estimated cost - $40,000. High benefit/cost value.

3. Cycle lanes on Mouat St Lyneham from Ginninderra Dr to Northbourne Avenue (1km)
Comment - a short missing link between the current Ginninderra Drive bike lanes and the planned Northbourne Ave lanes- would provide unbroken cycle lanes from North Belconnen all the way to Civic and beyond. Estimated cost - $20,000. High benefit/cost value.

4. Woden to Hughes Underpass and associated path links
Comment - Was part of the Downer-Woden cycle lanes originally proposed by Pedal Power. Will allow southbound cyclists on the Downer-Woden link to access the Woden Town Centre trunk path, and also allow on-road cyclists to avoid the roundabout in any direction when linking between Yarra Glen, Yamba Drive and Melrose Drive. A short linking bike path from the underpass to the junction of Groom/Webster Sts Hughes, and the existing path that commences there would create a proper Hughes-Phillip path route. Estimated cost - $800,000.

5. A city-wide comprehensive signage system
Comment - Signage on many bike paths is non-existent. This discourages beginners. It also undermines the effectiveness of TravelSmart programs. Estimated cost for 240 signs at all major bike path intersections – $60,000. This covers non-trunk paths, signing these paths is important to encourage cycling which feeds into the trunk paths.

6. Completion of the Jerrabomberra Wetlands path. This is the only part of the Lake Burley Griffin cycle path that is unsealed. It is also hard to find your way through the wetlands along the path if you are unfamiliar with the area. Estimated cost - $200,000.

7. Bike lanes/on-road separated path from Fairbairn Ave to Campbell Park. (700 metres).
Currently planned works on Fairbairn Ave project will include on-road cycling lanes, however the connection into Campbell Park is poor. Not part of a trunk route but an important collector route as Campbell Park is a major employment centre with 2000 plus employees.

8. Trial of cyclepath lighting - suggested route Sullivan's Creek cycle path from the ANU to Dickson.
Comment - Cycling drops off in winter. A major reason is poor lighting of cycle paths. The Sullivan's Creek path is very well used. Lighting is particularly important for safety reasons. Estimated cost for 3km - $250,000.

9. City to Airport bike path - construction of a 2km path from existing path at Dairy Flat Rd Duntroon, east along river bank beneath 2 traffic bridges (there is space available) then parallel to Pialligo Rd and then crossing it east of Ulinga Pl into airport.
Comment - When combined with existing lakeshore paths would properly connect airport precinct to city. The airport precinct is a fast growing employment area, and only the major destination in Canberra identified by Pedal Power that does not have a bike path to it. Estimated cost - $450,000.

10. Federation Square Bike path - from existing William Slim/Gundaroo Drive path to Federation Square (500 metres)
Comment - would connect Belconnen suburbs to Federation Square and North Gungahlin. The first five hundred metres have been constructed but stop in a dead end. This is not a Pedal Power suggested trunk route but we believe that it should be completed to make this 'cycle path to nowhere' into a cycle path to somewhere. An important feeder route to/from the Belconnen/Gungahlin trunk route that we have identified. Estimated cost - $150,000.

11. Cycle path from Tallara Parkway Narrabundah to Wormald St Symonston East, passing underneath Monaro Hwy at already constructed crossing next to Jerrabomberra Creek (700m)
Comment - would create useful short cut between eastern South Canberra and Fyshwick and one option for South Canberra - Hume/Tuggeranong commuters to join the Monaro Hwy. Estimated cost - $150,000.

12. Cycle path from Hartigan St Garran to Goyder St Narrabundah (2km)
Comment - would provide safer off road path alternative to Hindmarsh Drive which is on-road and has no cycle lanes. The preferred route would have lower gradients by initially staying close to Hindmarsh Drive and following contours to avoid the steep service track which goes over the hill. Could be done in 2 stages: Hartigan to Tamar first, and later to Goyder St. Estimated cost - $500,000.

(When completed 11 and 12 would provide the safe trunk route connecting Woden, the Inner South, Fyshwick and Queanbeyan that we have identified on our map).

APPENDIX F

Summary of Public Comments and Sketch Maps

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Summary of Public Comments

Ref. No.	Missing Links/Requested Routes	Location	No. Comments Received (Comments Sheets)	No. Comments Received (Information Sessions)	Total No. Comments Received
1	**Cotter Road between Streeton Drive and Adelaide Ave** **Cotter Road between McCulloch Street and Lady Denman roundabout** **Cotter Road between Lady Denman Drive and Dunrossil Drive.** **Cotter Road up to Mt Stromlo**	**Curtin**	**14**	**6**	**20**
2	**Civic-Woden cyclelane beyond Yarra-Glen/Yamba Drive Roundabout to Woden/Phillip or connect to of road bike path that goes through the roundabout (underpass?)** **Connect cyclelane through to Callum Street via Launceston Street**	**Curtin, Hughes, Phillip**	**8**	**6**	**14**
3	**Hindmarsh Drive between Melrose Drive and Monaro Highway** **Hindmarsh Drive between Woden and Weston** **Hindmarsh Drive between Woden and Fyshwick** **Hindmarsh Drive Rivett to Fyshwick** **Hindmarsh Drive (southside) adjacent to Waramanga**	**Phillip, Symonston, Woden, Weston Stirling, Holder, Rivett, Waramanga**	**8**	**6**	**14**

Summary of Public Comments

Ref. No.	Missing Links/Requested Routes	Location	No. Comments Received (Comments Sheets)	No. Comments Received (Information Sessions)	Total No. Comments Received
4	**Barton Highway, Gold Creek to Hall including connection to Gold Creek** **Barton Highway, Lyneham to Hall including William Slim roundabout** **Barton Highway, Curran Drive to Kuringa Drive** **Fill gaps on Barton Highway**	**Hall, Lyneham, Nicholls**	**5**	**6**	**11**
5	**Kings Avenue Bridge to Russell and Campbell Park Offices**	**Russell, Campbell**	**7**	**4**	**11**

Summary of Public Comments

Ref. No.	Missing Links/Requested Routes	Location	No. Comments Received (Comments Sheets)	No. Comments Received (Information Sessions)	Total No. Comments Received
6	**Eastern side of North Canberra through Ainslie, Braddon, Reid, Campbell and Russell, Hackett, Watson,** **Base of Ainslie/Majura reserve to Civic (via Ainslie Avenue)** **Civic to Federal Highway via Phillip Ave and Antill St and Ainslie Majura Reserve** **Civic to Braddon, Reid,Ainslie, Hackett, Watson either behind Ainslie School or on/near Dyke behind Ainslie** **Base of Ainslie/Majura reserve to Fairbairn Avenue with connections to adjoining suburbs** **Monash Drive** **Phillip Avenue between Federal Avenue and Monash Avenue**	**Ainslie, Braddon, Reid, Campbell and Russell, Watson Hackett**	**7**	**3**	**10**

Summary of Public Comments

Ref. No.	Missing Links/Requested Routes	Location	No. Comments Received (Comments Sheets)	No. Comments Received (Information Sessions)	Total No. Comments Received
7	**Fill in gaps along Ginninderra Drive**	**Lyneham, Kaleen, Lawson, McKellar, Melba, Charnwood, Dunlop**	**6**	**4**	**10**
8	**Airport to wetlands/Duntroon, Moreshed Drive** **Through Wetlands**	**Pialligo Campbell**	**4**	**5**	**9**
9	**Belconnen Way between Coulter Drive and Kingsford Smith Drive**	**Page, Scullin**	**6**	**3**	**9**
10	**Yamba Drive to Tuggeranong including Erindale Drive** **Yamba Drive from existing cycle lane on Adelaide Avenue to Hospital** **Yamba Drive to existing path in Isaacs**	**Garran, Isaacs, Fadden, Wanniassa, Oxley, Greenway**	**6**	**3**	**9**
11	**Fill gaps on Barry Drive (bus lane)** **Barry Drive/Wakefield Avenue to Constitution Avenue**	**Turner**	**3**	**5**	**8**
12	**Southern side of Kings Avenue Bridge to Lake, High Court etc**	**Parkes**	**5**	**3**	**8**

Summary of Public Comments

Ref. No.	Missing Links/Requested Routes	Location	No. Comments Received (Comments Sheets)	No. Comments Received (Information Sessions)	Total No. Comments Received
13	Kuringa Drive between Kingsford Smith and Barton Highway Kuringa Drive Kuringa Drive across Barton Highway to Ngunnawal via Clarrie Hermes	Belconnen	5	2	7
14	Mouat Street Mouat Street and Ellenborough Street	Lyneham, Kaleen	5	2	7
15	Dickson College to Watson/Hackett (Antill Street) Dickson School, Newton Street to Antill Street Dickson College to Hackett Shops via Phillip Street and Madigan St	Watson, Hackett	4	1	5
16	Fill Gaps in Canberra Avenue and Wentworth Avenue	Narrabundah, Griffith		5	5
17	Flemington Road Flemington Road Federal Highway to EPIC		1	4	5
18	Civic and lake near National Museum Around National Museum between Hospital Point and existing cycle path which is parallel to Lawson Crescent	City,Acton	3	1	4

Summary of Public Comments

Ref. No.	Missing Links/Requested Routes	Location	No. Comments Received (Comments Sheets)	No. Comments Received (Information Sessions)	Total No. Comments Received
19	**Connect existing path at the Athllon Drive/Hindmarsh Drive intersection to existing path south of Corinna Street/Melrose Drive intersection** **Existing path at the Athllon Drive/Hindmarsh Drive intersection goes no where**	**Phillip, Lyons**		**4**	**4**
20	**Dairy Flat Road to Wentworth Avenue through Jerrabomberra Wetlands**	**Fyshwick, Kingston**		**4**	**4**
21	**Drakeford Drive between Taverner Street and Athllon Drive connecting to existing cycle path parallel to Athllon Drive** **Drakeford Drive between Isabella Drive and Barr Smith Avenue**	**Wanniassa, Isabella Plains, Bonython**	**1**	**3**	**4**
22	**Fairbairn Avenue/Pialligo Road, Dickson , Airport, Queanbeyan** **War Memorial to Airport**	**Dickson, Ainslie Reid, Campbell**	**2**	**2**	**4**
23	**Kent Street and Wisdom St**	**Deakin, Hughes**	**1**	**3**	**4**

Summary of Public Comments

Ref. No.	Missing Links/Requested Routes	Location	No. Comments Received (Comments Sheets)	No. Comments Received (Information Sessions)	Total No. Comments Received
24	On road lanes on Alberga, Shannon, Dryandra Nicholson Streets Dryandra Street Nicholson Street	Kaleen, Bruce, O'Connor, Turner	1	3	4
25	Upgrade Streeton Drive	Weston, Holder	3	1	4
26	Dairy Road to Fyshwick	Fyshwick	1	2	3
27	Haig Park	Turner, Ainslie	1	2	3
28	Lake Tuggeranong seal all way around Seal under Soward Way Bridge	Greenway	2	1	3
29	Monaro Highway, northbound Monaro Highway Isabella Drive to Fyshwick	Hume, Symonston	2	1	3
30	Namatjira Drive from Perry Street through Fisher and Chapman On road Namatjira Drive	Fisher, Chapman	1	2	3
31	Newcastle Street and Gladstone Street Monaro Higway/Newcastle St to Fyshwick	Fyshwick	3		3

Summary of Public Comments

Ref. No.	Missing Links/Requested Routes	Location	No. Comments Received (Comments Sheets)	No. Comments Received (Information Sessions)	Total No. Comments Received
32	Northbourne Avenue, Civic to Downer	City, Braddon, Dickson Downer	1	2	3
33	Off road path from existing crossing over Ginninderra Creek (Evatt) through Carlile Street to existing path south of Ginninderra Drive Carlile Street to Croke Place over Ginninderra Creek	Evatt, Florey	2	1	3
34	State Circle	Capital Hill	2	1	3
35	Straighten Sections around the lake	Yarralumla		3	3
36	Through Kingston Foreshores	Kingston	2	1	3
37	Upgrade existing path through Macquarie and Cook and along Bindubi Street to the Lake	Macquarie, Cook		3	3
38	Antill Street from Northbourne Ave through Dickson and Downer	Dickson, Downer	1	1	2
39	Barry Drive crossing between Clunies Ross Street, Macaughey Street and Marcus Clarke Street	Turner	1	1	2
40	Benjamin Way between Emu Bank and Belconnen Way Benjamin Way between Emu Bank and College Street	Belconnen		2	2
41	Bindubi Street beyond Belconnen Way towards lake to connect to existing path Complete northern part of Bindubi Street	Aranda	1	1	2

Summary of Public Comments

Ref. No.	Missing Links/Requested Routes	Location	No. Comments Received (Comments Sheets)	No. Comments Received (Information Sessions)	Total No. Comments Received
42	Childers Street, past Llewellyn Hall to Marcus Clarke Street Barry Drive to Edinburgh Avenue behind Childers Street	City		2	2
43	Coulter Drive between Southern Cross Drive and Belconnen Way	Belconnen, Florey	2		2
44	Crossing Lady Denman Drive at the bottom of cycle path from Aranda (Acacia Inlet)	Aranda	2		2
45	From New Parliament House to Russell Offices (Kings Avenue)	Russell, Barton, Parkes	1	1	2
46	Ginninderra Drive to Belconnen Mall Aikman Drive	Belconnen	1	1	2
47	Gungahlin Drive Extension OFF Road	Kaleen, Lyneham	1	1	2
48	Haydon Drive between Ginninderra Street and College Street	Bruce	2		2
49	Heysen Street between Streeton Drive and Devonport Street (crossing Tuggeranong Parkway)	Lyons	1	1	2
50	Hollway Street to underpass at Tharwa Drive / Drakeford Drive intersection Hollway Street to existing path across Tharwa Drive	Calwell	1	1	2
51	La Perouse Street to Brereton Street	Red Hill, Garran		2	2

Summary of Public Comments

Ref. No.	Missing Links/Requested Routes	Location	No. Comments Received (Comments Sheets)	No. Comments Received (Information Sessions)	Total No. Comments Received
52	**Lake Burley Griffen to War Memorial, Parliament House and National Museum**	**Reid, Campbell, Parkes**	**2**		**2**
53	**Maribyrnong Street**	**Kaleen**	**1**	**1**	**2**
54	**Monaro Highway to Queanbeyan using Lanyon Drive**	**Hume, Queanbeyan**	**1**	**1**	**2**
55	**Northcott Drive**	**Campbell**	**1**	**1**	**2**
56	**Path past Kaleen South oval along the stormwater channel to Ginninderra Drive**	**Giralang, Kaleen**	**1**	**1**	**2**
57	**Southern Cross Drive between Coulter Drive and Kingsford Smith**	**Florey, Scullin, Page**		**2**	**2**
58	**Theodore substation around Tuggeranong Hill to Tharwa Drive**	**Theodore**	**1**	**1**	**2**
59	**Upgrade William Hovell Drive**	**Belconnen**		**2**	**2**
60	**Widen Lakeside track**	**Acton**		**2**	**2**
61	**Woden Town Centre to Tuggeranong (Athllon Drive) on road**	**Phillip, Pearce, Torrens, Kambah, Wanniassa**	**1**	**1**	**2**
62	Anzac Parade	Reid		1	1
63	Ashley Drive underpass to the bridge opposite Isabella Drive	Isabella Plains	1		1
64	Athllon Drive between Mawson and Phillip	Mawson, Phillip		1	1

Summary of Public Comments

Ref. No.	Missing Links/Requested Routes	Location	No. Comments Received (Comments Sheets)	No. Comments Received (Information Sessions)	Total No. Comments Received
65	Baldwin Drive	Lawson, Giralang, Kaleen		1	1
66	Banjalong Crescent from underpass at Primary School to Bindubi Crescent	Aranda		1	1
67	Belconnen Way between Dryandra Street and Barry Drive	O’Connor		1	1
68	Between Watson,Ainslie and Civic	Watson,Ainslie and Civic	1		1
69	Black Mountain (possibly upgrade the “Summit Walk”)	Black Mountain	1		1
70	Blamey Street and Currong Street	Campbell, Reid, City		1	1
71	Bolderwood Street and Miller Street	Turner		1	1
72	Boulderwood to ANU	Turner, Acton		1	1
73	Braddon to Civic, Torrens Street, Mort Street	Braddon, City	1		1
74	Canberra Ave to Fyshwick	Fyshwick	1		1
75	Captain Cook Crescent between Manuka and Narrabundah	Griffith, Narrabundah	1		1
76	Caswell Drive	Aranda	1		1
77	Caswell Drive between Belconnen Way to Bandjalong Crescent	Aranda		1	1
78	Chisholm Shops to existing pathway to Tuggeranong Town Centre.	Chisholm	1		1
79	College Street	Belconnen, Bruce		1	1

Summary of Public Comments

Ref. No.	Missing Links/Requested Routes	Location	No. Comments Received (Comments Sheets)	No. Comments Received (Information Sessions)	Total No. Comments Received
80	Complete Athllon Drive on road from existing lane to Hindmarsh Drive	Pearce, Mawson, Torrens, Wanniassa		1	1
81	Connect City to Jerrabomberra wetlands via Constitution Avenue and Morsehead Drive	Reid, Russell, Campbell		1	1
82	Connect cycle lane on Wentworth Avenue to path in Bowen Park	Kingston, Barton		1	1
83	Connect existing path north of Athllon Drive to existing path under Drakeford Drive to Jenke Circuit	Kambah		1	1
84	Connect existing paths behind Kevin Street and Owen Dixon Drive	Evatt		1	1
85	Connect Federartion Square to existing path at William Slim/Gundaroo Drive	Nicholls		1	1
86	Connect footbridge over Ginninderra Creek (Giralang) to path running south parallel to William Slim Drive	Giralang	1		1
87	Connect Ginninderra Drive to Coulter Drive and Lake bike path	Belconnen	1		1
88	Connect Gungahlin Market Place to Kosciuszko Avenue	Gungahlin, Harrison, Palmerston		1	1
89	Connect Horse Park Drive to Mirrabei Dr	Ngunawal		1	1
90	Connect Kingsaford Smith Drive to Curran Drive	Spence, Nicholls		1	1
91	Connect Monaro Highway to Kootara Street	Narrabundah		1	1

Summary of Public Comments

Ref. No.	Missing Links/Requested Routes	Location	No. Comments Received (Comments Sheets)	No. Comments Received (Information Sessions)	Total No. Comments Received
92	Connect path from crossing at Dickson Place to existing cycle which continues to Northbourne Avenue	Dickson	1		1
93	Connect path in Bindubi Street to path in Bandjalong Crescent	Aranda		1	1
94	Connect path south of Ginninderra Creek (Evatt) to Copland Drive bridge.	Evatt	1		1
95	Connect paths between Fraser and Spence, north of Mt Rogers Reserve	Fraser, Spence		1	1
96	Connect paths either side of Evatt Shops (Heydon Crescent)	Evatt		1	1
97	Connect Yamba Drive/Erindale Drive cyclepath from 200m north of Long Gully Road to South of Sulwood Drive	Isaacs, Farrar, Wanniassa	1		1
98	Connect Yarra Glen on road cycling to existing off road path east of Curtin	Curtin		1	1
99	Continue Fleminton Road/Wells Station Road into Gungahlin	Gungahlin		1	1
100	Continue path along Sullivans Creek from Mouat Street to EPIC	Lyneham		1	1
101	Continue path from Woodcock Drive to Point Hut Crossing	Gordon		1	1
102	Continue path on west side of Ashley Drive across Erindale Drive to Erindale Centre	Monash		1	1
103	Cotter Road between Streeton Drive and Uriarra Road	Holder, Duffy	1		1
104	Coyne Street	Macarthur	1		1

Summary of Public Comments

Ref. No.	Missing Links/Requested Routes	Location	No. Comments Received (Comments Sheets)	No. Comments Received (Information Sessions)	Total No. Comments Received
105	Crossing Alexandrina Drive near the Chinese Embassy	Yarralumla	1		1
106	Crossing Belconnen Way to Barry Drive	Aranda, Turner	1		1
107	Crossing from Botanic Gardens to ANU over Clunies Ross Drive	Acton	1		1
108	Crossing from Lake Burley Griffen to Russell Offices over Parkes Way	Russell	1		1
109	Crossing Haydon Drive at the top of O'Connor Ridge	O'Connor, Bruce	1		1
110	Crossing of Morsehead Drive near Russell Drive,	Russell	1		1
111	Dickson Drive	Holder	1		1
112	Direct route from Kaleen South oval to Bruce Stadium	Kaleen, Bruce	1		1
113	Direct Route from Sulwood Drive/Athllon Drive intersection to Erindale Centre/Shops	Wanniassa		1	1
114	Dixon Drive	Duffy, Holder		1	1
115	Dominion Circuit/New South Wales Crescent/Macquarie Street	Deakin, Forrest, Barton		1	1
116	Eaglemont Retreat to existing path at Louis Loder Street	Condor, Theodore		1	1
117	Eastern Valley Way between Lake Ginninderra College and College Street	Belconnen, Bruce	1		1
118	Ellenborough Street extend path from Kaleen to Mitchell	Kaleen, Mitchell	1		1

Summary of Public Comments

Ref. No.	Missing Links/Requested Routes	Location	No. Comments Received (Comments Sheets)	No. Comments Received (Information Sessions)	Total No. Comments Received
119	Fill gaps on Gungahlin Drive	Crace, Franklin, Palmerston		1	1
120	Fitchett Street	Garran	1		1
121	Flemington Road/Randwick Street intersection to Sandford Street	Mitchell, Lyneham		1	1
122	Fullagar Crescent between Higgins Pre School and Nicholls Place	Higgins	1		1
123	Garryowen Drive to John Cardiff Close (Black Mountain Peninsula	Yarralumla		1	1
124	Ginninderra Drive to University of Canberra	Bruce		1	1
125	Gozzard Street	Gungahlin		1	1
126	Hackett to Parkes	Dickson, Ainslie, Braddon, Parkes	1		1
127	Heard Street to Mawson Drive behind Southlands Shops	Mawson		1	1
128	Hindmarsh Drive/Callam intersection to Woden Plaza.	Phillip	1		1
129	Horse Park Drive between Federal Highway to Amaroo	McMahon, Mulanggarri, Harrison, Amaroo		1	1
130	Isabella Drive between Coyne Street and Monaro Highway	Macarthur		1	1
131	Isabella Drive between Drakeford Drive and existing north/south cycle path (South of Isabella Pond)	Monash		1	1

Summary of Public Comments

Ref. No.	Missing Links/Requested Routes	Location	No. Comments Received (Comments Sheets)	No. Comments Received (Information Sessions)	Total No. Comments Received
132	Johnson Drive between Monaro Highway and Drakeford Drive	Calwell, Richardson, Isabella Plains		1	1
133	Justininan Street/Yamba Drive intersection to Callam Street through Edison Park	Phillip		1	1
134	Kaleen North Oval across Barton Highway to Bellenden Stree	Kaleen		1	1
135	Kaleen/Giralang to Belconnen Town Centre	Giralang, Kaleen, Belconnen	1		1
136	Kambalda Crescent to Fisher Shops	Fisher		1	1
137	Kent Street to Weston Park	Deakin, Yarralumla		1	1
138	Kingsford Smith Drive	Spence, Melba, Higgins, Latham	1		1
139	Knox Street between Dickinson Street and Majura Primary	Watson	1		1
140	Lake Burley Griffen around Lennox Gardens	Yarralumla		1	1
141	Lake Burley Griffen between Boat House and Hospice	Barton	1		1
142	Lake Burley Griffen between Boat House and Kings Avenue	Barton	1		1
143	Lake Burley Griffen Central Basin from Commonwealth Avenue Bridge to Nerang Pool	Parkes		1	1

Summary of Public Comments

Ref. No.	Missing Links/Requested Routes	Location	No. Comments Received (Comments Sheets)	No. Comments Received (Information Sessions)	Total No. Comments Received
144	Lake Burley Griffen to Parkes Way	Russell, Barton, Parkes	1		1
145	Lanyon Drive	Queanbeyan, Jerrabomberra, Hume	1		1
146	Lathlain Street to Belconnen Way	Belconnen		1	1
147	Lathlain Street to Benjamin Way	Belconnen	1		1
148	Launceston Street	Phillip		1	1
149	Limestone Avenue	Ainslie, Braddon		1	1
150	Link between Hackett, Watson, Downer, Ainslie & Dickson shops	Hackett, Watson, Downer, Ainslie Dickson	1		1
151	Link between path across College Street and Kirinari Street	Bruce	1		1
152	Macarthur Avenue	O’Connor, Turner		1	1
153	Macarthur Avenue between Dryandra Street and Belconnen Way	O’Connor	1		1
154	Madigan/Hannan/Sherbrooke/Angas/Torrens Streets	Hackett, Ainslie, Dickson, Watson, City		1	1

Summary of Public Comments

Ref. No.	Missing Links/Requested Routes	Location	No. Comments Received (Comments Sheets)	No. Comments Received (Information Sessions)	Total No. Comments Received
155	Majura Rd from Gungahlin to Fyshwick	Gungahlin, Fyshwick	1		1
156	Majura Road	Majura		1	1
157	Melrose Drive between Theodore Street and Hindmarsh Drive	Lyons, Phillip	1		1
158	Mirrabei Drive between Paul Coe Crescent and Ginninderra Creek	Ngunawal		1	1
159	Monaro Highway, southbound adjacent to Hume	Hume		1	1
160	Moore Street and Mort Street	Turner, O'Connor		1	1
161	Mort Street to Lakeside Cyclepath	City	1		1
162	Mugga Lane between Long Gully tip to Monaro Highway	Isaacs	1		1
163	Netball Centre to Barton Highway	Lyneham	1		1
164	North Canberra to Mitchell and Gungahlin	Mitchell,Gungahlin	1		1
165	O'Connor ridge to ANU/Civic	O'Connor	1		1
166	On road to Gungahlin shops	Gungahlin	1		1
167	Parkes Way to Commonwealth Avenue Bridge	Belconnen	1		1
168	Parkes Way to William Hovell Drive	Belconnen	1		1
169	Path along Weston Park Road and bridge over lake to Canberra Nature Park (Black Mountain)	Yarralumla		1	1
170	Path along fire trail west of Bonython from Isabella Drive to Johnson Drive	Bonython		1	1
171	Path between Hindmarsh Drive and Pearce underpass of Athllon Drive	Phillip, Pearce	1		1

Summary of Public Comments

Ref. No.	Missing Links/Requested Routes	Location	No. Comments Received (Comments Sheets)	No. Comments Received (Information Sessions)	Total No. Comments Received
172	Path connecting Flinders Way to Kent Street along stormwater channel south of Deakin	Deakin, Red Hill		1	1
173	Path from Hartigan Street to Goyder Street	Garran, Narrabundah		1	1
174	Path on easter side of Copland Drive	Evatt	1		1
175	Path running parallel to Northbourne Avenue, Majura Road using Sherbrooke Street, Lowanna Street, Henty Street, Mort Street	Braddon, Ainslie		1	1
176	Path through CIT	Weston		1	1
177	Path to Queanbeyan between Telopea Park and Fyshwick	Kingston, Fyshwick	1		1
178	Remove pinch points on Athllon Drive	Greenway	1		1
179	Remove pinch points on Tuggeranong Parkway		1		1
180	Rosenthal Street to Northcott Street parallel to Fairbairn Avenue	Campbell	1		1
181	Russell to Fyshwick	Russell, Fyshwick	1		1
182	Seal along Sullivan's Creek from Fellows Road to Parkes Way	Acton		1	1
183	Service Road parallel to Sturt Avenue and Jerrabomberra Avenue	Narrabundah		1	1
184	South of Kenyon Circuit to Cockcroft Avenue south of Monash Retirement Village	Monash		1	1
185	Sulwood Drive between Drakefrod Drive and Erindale Drive	Kambah, Wanniassa		1	1

Summary of Public Comments

Ref. No.	Missing Links/Requested Routes	Location	No. Comments Received (Comments Sheets)	No. Comments Received (Information Sessions)	Total No. Comments Received
186	Sulwood Drive between Tuggeranong Parkway and Colquhoun St	Kambah	1		1
187	Sulwood Drive to Johnson Drive via Erindale Drive and Ashley Drive	Fadden, Wanniassa, Gowrie, Richardson, Isabella Plains		1	1
188	Swinden Street to Ginninderra Drive	Downer, Lyneham		1	1
189	Sydney Avenue/New South Wales Crescent/Currie Crescent/Leichardt Street	Fyshwick, Kingston, Barton		1	1
190	Tallara Parkway to Wormald Street under Monaro Highway	Narrabundah, Symonston		1	1
191	Tharwa Drive / Drakeford Drive intersection to connect to path at Tyner Street	Theodore	1		1
192	Tharwa Drive from Pocket Avenue to Tharwa	Banks, Tharwa		1	1
193	Tuggeranong Parkway to Kambalda Cres to Fisher shops.	Fisher	1		1
194	Underpass on Parkes Way near Russell roundabout	Russell		1	1
195	Uriarra Road from Cotter Road to Coppins Crossing	Stromlo		1	1
196	Urriarra Road between Cotter Road and Coppins Crossing Road	Stromlo	1		1
197	Vicars Street	Mitchell		1	1

Summary of Public Comments

Ref. No.	Missing Links/Requested Routes	Location	No. Comments Received (Comments Sheets)	No. Comments Received (Information Sessions)	Total No. Comments Received
198	Watson to Civic On Road, Dooring, Lowanna, Henty, Mort Street	Ainslie, Braddon, Reid, Campbell and Russell, Watson Hackett	1		1
199	Wendouree Drive	Parkes	1		1
	Westgarth Street/Hart Street	Acton, Belconnen, City		1	1
200	Wetlands to Canberra Avenue	Fyshwick	1		1
201	William Slim Drive between Barton Highway and Chuculba Crescent	Giralang	1		1
202	William Slim Drive/Gundaroo Drive from Ginninderra Drive to Mirrabei Drive	Lawson, Mckellar, Giralang, Palmerston, Harrison		1	1
203	Within Civic and to Civic Pool	City	1		1
	Total				**421**

Horse Park Road
HALL
AMAROO
NGUNNAWAL
FORDE
HARRISON
THROSBY
NICHOLLS
DUNLOP
FRASER
Gooromon Ponds
CHARNWOOD
SPENCE
PALMERSTON
FRANKLIN
PARK DR
FLYNN
MULANGGARRI
CRACE
HORSE PARK DR
MACGREGOR
MELBA
EVATT
GIRALANG
FLEMINGTON RD
MCKELLAR
KENNY
McMAHON
LATHAM
MITCHELL
SOUTHERN CROSS DRIVE
FLOREY
FEDERAL HWY
HOLT
KALEEN
MAJURA RD
BELCONNEN
GINNINDERRA DRIVE
BARTON HWY
HIGGINS
SCULLIN
LYNEHAM
WATSON
PAGE
GUNGAHLIN DR
DOWNER
HAWKER
BELCONNEN WAY
BRUCE
HACKETT
WEETANGERA
DICKSON
MACQUARIE
O'CONNOR
COOK
ARANDA
AINSLIE
BINDUBI STREET
TURNER
BRADDON
Molonglo
WILLIAM HOVELL DR
CITY
REID
GLENLOCH INTERCHANGE
PARKES WAY
ACTON
CAMPBELL
River
RUSSELL
PARKES
MORSHEAD DRIVE
YARRALUMLA
CAPITAL HILL
BARTON
PIALLIGO
ADELAIDE AVE
KINGSTON
FORREST
DEAKIN
COTTER RD
CURTIN
GRIFFITH
FYSHWICK
RED HILL
RED HILL
DUFFY
HOLDER
HUGHES
WESTON
NARRABUNDAH
LYONS
CANBERRA AVE
GARRAN
RIVETT
PHILLIP
SYMONSTON
STIRLING
WARAMANGA
CHIFLEY
O'MALLEY
CHAPMAN
FISHER
PEARCE
MAWSON
ISAACS
TORRENS
FARRER
SULWOOD DRIVE
KAMBAH
MONARO HWY
HUME
WANNIASSA
FADDEN
MACARTHUR
ATHLLON DR
OXLEY
GOWRIE
ISABELLA DRIVE
OLEMORE
GILMORE
MONASH
CHISHOLM
Isabella Pond
Stranger Pond
ISABELLA PLAINS
RICHARDSON
BONYTHON
Tuggeranong Creek
CALWELL
THEODORE
Point Hut Pond
GORDON
CONDER
BANKS
N
Scale 1:20 000
EXISTING ON ROAD CYCLE LANES
EXISTING MAIN OFF ROAD PATHS
EXISTING MINOR OFF ROAD PATHS
Eastern side of North Canberra lacks cycle routes → more red
This map is incomplete for cycle lanes/paths and wide shoulders!
Suggested New Route providing access to Barton etc. for North residents
Gold Creek Tourism Area
Join into Gold Creek
Link
Join paths
Join here needed
Re-draw lanes to include bike paths (yes, there is room)
Seal this path
To be painted on major shared pathways to teach the pedestrians to keep left. They tend to walk looking at their feet so signs are less effective.
Dickson Session Monday 9 Feb 2004

Scale 1:20 000
EXISTING ON ROAD CYCLE LANES
EXISTING MAIN OFF ROAD PATHS
EXISTING MINOR OFF ROAD PATHS
HALL
AMAROO
NGUNNAWAL
FORDE
HARRISON
NICHOLLS
THROSBY
DUNLOP
FRASER
PALMERSTON
FRANKLIN
SPENCE
CHARNWOOD
FLYNN
MULANGGARRI
CRACE
MACGREGOR
MELBA
EVATT
GIRALANG
KENNY
McMAHON
LATHAM
MCKELLAR
MITCHELL
HOLT
FLOREY
LAWSON
BELCONNEN
KALEEN
HIGGINS
SCULLIN
PAGE
LYNEHAM
WATSON
HAWKER
DOWNER
WEETANGERA
BRUCE
HACKETT
MACQUARIE
DICKSON
O'CONNOR
COOK
ARANDA
AINSLIE
TURNER
BRADDON
GLENLOCH INTERCHANGE
PARKES WAY
ACTON
CITY
REID
CAMPBELL
RUSSELL
PARKES
WILLIAM HOVELL DR
FEDERAL HWY
HORSE PARK DR
MAJURA RD
YARRALUMLA
CAPITAL HILL
BARTON
PIALLIGO
DEAKIN
FORREST
KINGSTON
CURTIN
GRIFFITH
FYSHWICK
RED HILL
HUGHES
NARRABUNDAH
DUFFY
HOLDER
WESTON
LYONS
GARRAN
RIVETT
STIRLING
PHILLIP
SYMONSTON
WARAMANGA
CHIFLEY
O'MALLEY
CHAPMAN
FISHER
PEARCE
MAWSON
ISAACS
TORRENS
FARRER
KAMBAH
WANNIASSA
FADDEN
HUME
MONARO HWY
OXLEY
MACARTHUR
GREENWAY
GOWRIE
MONASH
GILMORE
CHISHOLM
ISABELLA PLAINS
RICHARDSON
BONYTHON
CALWELL
THEODORE
GORDON
CONDER
BANKS
V. BAD MISSING LINK
Smoother surface
New Constr. off Rd path to Bridge
MONASH
Riding along Johnson Drive is DANGEROUS
No link to Drakeford drive from Calwell - growing population - club - community centre
Connection from Theodore to Condor Drakeford Drive
* Place name of Road on all underpasses


Generally :
Make to and from
School (primary + secondary)
Safer for kids by
– adding bike path connectors
– at-school paths that
omit crossing drop-off "roads"
HALL
NGUNNAWAL
AMAROO
FORDE
HARRISON
THROSBY
NICHOLLS
PALMERSTON
FRANKLIN
MULANGGARRI
CRACE
MITCHELL
KENNY
McMAHON
DUNLOP
FRASER
SPENCE
CHARNWOOD
FLYNN
MELBA
EVATT
GIRALANG
MACGREGOR
LATHAM
McKELLAR
HOLT
FLOREY
LAWSON
KALEEN
HIGGINS
BELCONNEN
SCULLIN
PAGE
LYNEHAM
WATSON
HAWKER
DOWNER
WEETANGERA
BRUCE
HACKETT
MACQUARIE
DICKSON
O'CONNOR
COOK
ARANDA
AINSLIE
TURNER
BRADDON
GLENLOCH INTERCHANGE
ACTON
CITY
REID
CAMPBELL
RUSSELL
PARKES
YARRALUMLA
CAPITAL HILL
BARTON
PIALLIGO
KINGSTON
FORREST
DEAKIN
CURTIN
GRIFFITH
FYSHWICK
RED HILL
DUFFY
HOLDER
WESTON
HUGHES
NARRABUNDAH
LYONS
GARRAN
RIVETT
STIRLING
PHILLIP
SYMONSTON
WARAMANGA
O'MALLEY
CHAPMAN
FISHER
PEARCE
MAWSON
ISAACS
TORRENS
FARRER
KAMBAH
WANNIASSA
FADDEN
HUME
OXLEY
MACARTHUR
GREENWAY
GOWRIE
MONASH
GILMORE
CHISHOLM
ISABELLA PLAINS
RICHARDSON
BONYTHON
CALWELL
THEODORE
GORDON
CONDER
BANKS
No link from here to anywhere
This section in poor condition
Dangerous crossing
This would be a very popular route to Woden, if it was safe
Existing path is good but no liaisons to Yamba at either end.
Weston to Woden path is very badly in need of repair, maintenance & cleaning – esp as there is no on road cycling on this way to town
Very Dangerous Corners, the path crosses roads & vehicles turn left at speed
Scale 1:20 000
EXISTING ON ROAD CYCLE LANES
EXISTING MAIN OFF ROAD PATHS
EXISTING MINOR OFF ROAD PATHS


HALL
AMAROO
FORDE
NGUNNAWAL
HARRISON
THROSBY
NICHOLLS
DUNLOP
FRASER
CHARNWOOD
PALMERSTON
FRANKLIN
MULANGGARRI
SPENCE
CRACE
FLYNN
GIRALANG
MACGREGOR
EVATT
McKELLAR
KENNY
McMAHON
LATHAM
MITCHELL
HOLT
FLOREY
LAWSON
KALEEN
HIGGINS
BELCONNEN
SCULLIN
PAGE
WATSON
LYNEHAM
DOWNER
HAWKER
BRUCE
HACKETT
WEETANGERA
MACQUARIE
DICKSON
O'CONNOR
ARANDA
COOK
AINSLIE
TURNER
BRADDON
ACTON
CITY
REID
CAMPBELL
RUSSELL
PARKES
YARRALUMLA
CAPITAL HILL
BARTON
PIALLIGO
FORREST
KINGSTON
DEAKIN
CURTIN
FYSHWICK
GRIFFITH
RED HILL
HUGHES
NARRABUNDAH
DUFFY
HOLDER
WESTON
LYONS
GARRAN
SYMONSTON
RIVETT
STIRLING
WARAMANGA
CHIFLEY
PHILLIP
O'MALLEY
CHAPMAN
FISHER
PEARCE
MAWSON
ISAACS
TORRENS
FARRER
KAMBAH
WANNIASSA
FADDEN
HUME
MACARTHUR
OXLEY
GOWRIE
GREENWAY
MONASH
GILMORE
CHISHOLM
ISABELLA PLAINS
RICHARDSON
BONYTHON
CALWELL
THEODORE
GORDON
CONDER
BANKS
HORSE PARK DR
FLEMINGTON RD
GUNGAHLIN DR
FEDERAL HWY
MAJURA RD
BARTON HWY
SOUTHERN CROSS DRIVE
WILLIAM HOVELL DR
BINDUBI STREET
PARKES WAY
COTTER RD
SULWOOD DRIVE
MONARO HWY
CANBERRA AVE
ADELAIDE AVE
FAIRBAIRN AV
ISABELLA DRIVE
Kerb edge needs a ramp to enable cyclists to cross.
306 (missing link)
On-road cycling is best, if road is safe. Off-road cycling is far preferable - no fumes from cars.
LIGHTING NEEDED ESP. IN WINTER
change of division of road back to 2-lanes to give room for on-road cycle lane
on-road lane
300
312
316
317
Tharwa
Scale 1:20 000
EXISTING ON ROAD CYCLE LANES
EXISTING MAIN OFF ROAD PATHS
EXISTING MINOR OFF ROAD PATHS
N

APPENDIX G

Draft Capital Works Programme

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

Cycling & Walking Master Plan: Capital Works Program (Click here for main report)

On Road Cycle Lanes

Location	From	To	Direction	Description of Works	Length(m)	Cost ($) Widening of Existing CarriagewayRequired	Cost ($) No Widening of Existing Carriageway Required	Priority
Drakeford Drive	Sulwood Drive	Taverner Street	SB	New On Road Cycling	3,900	$624,000	$78,000	2
Drakeford Drive	Taverner Street	Sulwood Drive	NB	New On Road Cycling	3,900	$624,000	$78,000	2
Drakeford Drive	Taverner Street	Isabella Drive	SB	New Symbols & Signs	2,210	N/A	$4,420	2
Drakeford Drive	Isabella Drive	Taverner Street	NB	New Signs	2,400	N/A	$2,400	2
Drakeford Drive	Box Hill Avenue	Isabella Drive	NB	New On Road Cycling	6,950	$1,112,000	$139,000	2
Drakeford Drive	Isabella Drive	Box Hill Avenue	SB	New On Road Cycling	6,950	$1,112,000	$139,000	2
Isabella Drive	Drakeford Drive	Monaro Hwy	EB	New On Road Cycling	6,650	$1,064,000	$133,000	2
Isabella Drive	Monaro Hwy	Drakeford Drive	WB	New On Road Cycling	5,180	$828,800	$103,600	2
Isabella Drive	Monaro Hwy	Drakeford Drive	WB	New Symbols & Signs	1,470	N/A	$2,940	2
Athllon Drive	Drakeford Drive	Melrose Drive	NB	New On Road Cycling	5,430	$868,800	$108,600	2
Athllon Drive	Melrose Drive	Drakeford Drive	SB	New On Road Cycling	5,430	$868,800	$108,600	2
Melrose Drive	Athllon Drive	Yarra Glen	NB	New On Road Cycling	1,380	$220,800	$27,600	2
Melrose Drive	Yarra Glen	Athllon Drive	SB	New On Road Cycling	1,380	$220,800	$27,600	2
Ashley Dr	Erindale Drive	Isabella Drive	SB	New On Road Cycling	1,600	$256,000	$32,000	3
Ashley Dr	Isabella Drive	Erindale Drive	NB	New On Road Cycling	1,600	$256,000	$32,000	3
Soward Way	Athllon Drive	Drakeford Drive	WB	New On Road Cycling	650	$104,000	$13,000	1
Soward Way	Drakeford Drive	Athllon Drive	EB	New On Road Cycling	650	$104,000	$13,000	1
Erindale Drive	Long Gully Road	Drakeford Drive	SB	New On Road Cycling	4,950	$792,000	$99,000	1
Erindale Drive	Drakeford Drive	Long Gully Road	NB	New On Road Cycling	4,950	$792,000	$99,000	1
Yamba Drive	Hindmarsh Drive	Long Gully Road	SB	New On Road Cycling	4,000	$640,000	$80,000	1
Yamba Drive	Long Gully Road	Hindmarsh Drive	NB	New On Road Cycling	4,000	$640,000	$80,000	1
Yamba Drive	Wisdom Street	Hindmarsh Drive	SB	New On Road Cycling	1,600	$256,000	$32,000	1
Yamba Drive	Hindmarsh Drive	Wisdom Street	NB	New On Road Cycling	1,600	$256,000	$32,000	1
Streeton Drive	Hindmarsh Drive	Cotter Road	NB	New On Road Cycling	1880	$300,800	$37,600	2
Streeton Drive	Cotter Road	Hindmarsh Drive	SB	New On Road Cycling	1880	$300,800	$37,600	2
Hindmarsh Drive	Tuggeranong Pky	Darwina Tce	WB	New On Road Cycling	4,100	$656,000	$82,000	2
Hindmarsh Drive	Darwina Tce	Tuggeranong Pky	EB	New On Road Cycling	3,900	$624,000	$78,000	2
Hindmarsh Drive	Darwina Tce	Tuggeranong Pky	EB	New Signs	200	N/A	$200	2
Hindmarsh Drive	Canberra Avenue	Tuggeranong Pky	WB	New On Road Cycling	10,025	$1,604,000	$200,500	2
Hindmarsh Drive	Tuggeranong Pky	Canberra Avenue	EB	New On Road Cycling	10,025	$1,604,000	$200,500	2
Newcastle Street	Canberra Avenue	Wollongong Street	NB	New On Road Cycling	1,000	$160,000	$20,000	2
Newcastle Street	Wollongong Street	Canberra Avenue	SB	New On Road Cycling	1,000	$160,000	$20,000	2
Irving Street	Yamba Drive	Launceston Street	SB	New On Road Cycling	750	$120,000	$15,000	1
Irving Street	Launceston Street	Yamba Drive	NB	New On Road Cycling	750	$120,000	$15,000	1
Cotter Road	Streeton Drive	Adelaide Avenue	EB	New On Road Cycling	3,400	$544,000	$68,000	2
Cotter Road	Streeton Drive	Adelaide Avenue	EB	New Symbols & Signs	1,220	N/A	$2,440	2
Cotter Road	Adelaide Avenue	Streeton Drive	WB	New On Road Cycling	3,750	$600,000	$75,000	2
Cotter Road	Adelaide Avenue	Streeton Drive	WB	New Symbols & Signs	870	N/A	$1,740	2
Canberra Avenue	HMAS Harman	Hume Place	NB	New On Road Cycling	700	$112,000	$14,000	3
Canberra Avenue	HMAS Harman	Hume Place	NB	Widening, New Symbols & Signs	4,500	$450,000	N/A	3
Canberra Avenue	Hume Place	HMAS Harman	SB	New On Road Cycling	4,500	$720,000	$90,000	3
Canberra Avenue	Hume Place	State Circle	NB	New On Road Cycling	2,670	$427,200	$53,400	2
Canberra Avenue	State Circle	Hume Place	SB	New On Road Cycling	2,670	$427,200	$53,400	2
Wentworth Avenue	Hume Place	Dawes Street	NB	New On Road Cycling	850	$136,000	$17,000	2
Wentworth Avenue	Dawes Street	Hume Place	SB	New On Road Cycling	850	$136,000	$17,000	2
Pialligo Avenue/Morshead Drive/Russell Drive/Constitution Avenue	Airport	London Circuit	WB	New On Road Cycling	7,080	$1,132,800	$141,600	1
Pialligo Avenue/Morshead Drive/Russell Drive/Constitution Avenue	London Circuit	Airport	EB	New On Road Cycling	7,080	$1,132,800	$141,600	1
Dairy Road	Morshead Drive	Monaro Hwy	SB	New On Road Cycling	370	$59,200	$7,400	3
Dairy Road	Monaro Hwy	Morshead Drive	NB	New On Road Cycling	370	$59,200	$7,400	3
Kings Avenue	Parliament House	Parkes Way	EB	New On Road Cycling	2,050	$328,000	$41,000	2
Kings Avenue	Parkes Way	Parliament House	WB	New On Road Cycling	2,050	$328,000	$41,000	2
Capital Circle	Adelaide Avenue	Coronation Drive	NB	New On Road Cycling	1,200	$192,000	$24,000	3
Capital Circle	Coronation Drive	Adelaide Avenue	SB	New On Road Cycling	1,200	$192,000	$24,000	3
Barry Drive	Marcus Clarke Street	Nicholson Street	NB	New On Road Cycling	1,680	$268,800	$33,600	2
Barry Drive	Nicholson Street	Marcus Clarke Street	SB	New On Road Cycling	1,680	$268,800	$33,600	2
Bolderwood Street	Barry Drive	Froggatt Street	NB	New On Road Cycling	270	$43,200	$5,400	3
Bolderwood Street	Froggatt Street	Barry Drive	SB	New On Road Cycling	270	$43,200	$5,400	3
Macarthur Avenue	Northbourne Avenue	Miller Street	WB	New On Road Cycling	1,550	$248,000	$31,000	3
Macarthur Avenue	Miller Street	Northbourne Avenue	EB	New On Road Cycling	1,550	$248,000	$31,000	3
Fairfax Street	Miller Street	Belconnen Way	WB	New On Road Cycling	1,050	$168,000	$21,000	3
Fairfax Street	Belconnen Way	Miller Street	EB	New On Road Cycling	1,050	$168,000	$21,000	3
Caswell Drive	Belconnen Way	Glenloch Interchange	SB	New On Road Cycling	3,050	$488,000	$61,000	2
Caswell Drive	Glenloch Interchange	Belconnen Way	NB	New On Road Cycling	3,050	$488,000	$61,000	2
Mouat Street	Northbourne Avenue	Ginninderra Drive	NB	New On Road Cycling	1,070	$171,200	$21,400	1
Mouat Street	Ginninderra Drive	Northbourne Avenue	SB	New On Road Cycling	1,070	$171,200	$21,400	1
Antill Street	Madigan Street	Federal Highway	NB	New On Road Cycling	2,450	$392,000	$49,000	3
Antill Street	Federal Highway	Madigan Street	SB	New On Road Cycling	2,450	$392,000	$49,000	3
Federal Highway	Mouat Street	Horse Park Drive	NB	New On Road Cycling	4,760	$761,600	$95,200	2
Federal Highway	Mouat Street	Antill Street	NB	Widening, New Symbols & Signs	1,200	$120,000	N/A	2
Federal Highway	Horse Park Drive	Mouat Street	SB	New Symbols & Signs	3,600	N/A	$7,200	2
Federal Highway	Horse Park Drive	Mouat Street	SB	New On Road Cycling	2,360	$377,600	$47,200	2
Horse Park Drive	Federal Highway	Forde	NB	New On Road Cycling	4,720	$755,200	$94,400	
Horse Park Drive	Forde	Federal Highway	SB	New On Road Cycling	4,720	$755,200	$94,400	
Flemington Road	Federal Highway	Harrison	NB	New On Road Cycling	1,100	$176,000	$22,000	3
Flemington Road	Federal Highway	Harrison	NB	New Signs	5,400	N/A	$5,400	3
Flemington Road	Harrison	Federal Highway	SB	New On Road Cycling	1,100	$176,000	$22,000	3
Flemington Road	Harrison	Federal Highway	SB	New Signs	5,400	N/A	$5,400	3
Barton Highway	Northbourne Avenue	Victoria Street	NB	New On Road Cycling	6,060	$969,600	$121,200	2
Barton Highway	Northbourne Avenue	Victoria Street	NB	New Symbols & Signs	2,950	N/A	$5,900	2
Barton Highway	Victoria Street	Northbourne Avenue	SB	New On Road Cycling	4,060	$649,600	$81,200	2
Barton Highway	Victoria Street	Northbourne Avenue	SB	New Symbols & Signs	2,950	N/A	$5,900	2
Barton Highway	Victoria Street	Mouat Street	SB	Widening, New Symbols & Signs	2,000	$200,000	N/A	2
William Slim Drive	Ginninderra Drive	Barton Highway	NB	New On Road Cycling	3,400	$544,000	$68,000	2
William Slim Drive	Barton Highway	Ginninderra Drive	SB	New On Road Cycling	3,400	$544,000	$68,000	2
Gundaroo Drive	Barton Highway	Horse Park Drive	NB	New On Road Cycling	4,700	$752,000	$94,000	2
Gundaroo Drive	Horse Park Drive	Barton Highway	SB	New On Road Cycling	4,700	$752,000	$94,000	2
Gungahlin Drive	Barton Highway	Clarrie Hermes Drive	NB	New On Road Cycling	3,200	$512,000	$64,000	1
Gungahlin Drive	Barton Highway	Clarrie Hermes Drive	NB	New Symbols & Signs	1,600	N/A	$3,200	1
Gungahlin Drive	Barton Highway	Clarrie Hermes Drive	NB	Widening, New Symbols & Signs	2,450	$245,000	N/A	1
Gungahlin Drive	Barton Highway	Clarrie Hermes Drive	NB	Widening & New Signs	100	$10,000	N/A	1
Gungahlin Drive	Clarrie Hermes Drive	Barton Highway	SB	New On Road Cycling	3,810	$609,600	$76,200	1
Gungahlin Drive	Clarrie Hermes Drive	Barton Highway	SB	Widening, New Symbols & Signs	3,590	$359,000	N/A	1
Kingsford Smith Drive	Ginninderra Drive	Kuringa Drive	NB	New On Road Cycling	4,100	$656,000	$82,000	3
Kingsford Smith Drive	Kuringa Drive	Ginninderra Drive	SB	New On Road Cycling	4,100	$656,000	$82,000	3
Kuringa Drive	Kingsford Smith Drive	Barton Highway	NB	New On Road Cycling	1,700	$272,000	$34,000	3
Kuringa Drive	Barton Highway	Kingsford Smith Drive	SB	New On Road Cycling	1,700	$272,000	$34,000	3
Kingsford Smith Drive	Ginninderra Drive	William Hovell Drive	SB	New Symbols & Signs	1,250	N/A	$2,500	3
Kingsford Smith Drive	Ginninderra Drive	William Hovell Drive	SB	Widening, New Symbols & Signs	1,270	$127,000	N/A	3
Kingsford Smith Drive	William Hovell Drive	Ginninderra Drive	NB	New Signs	3,100	N/A	$3,100	3
Belconnen Way	Kingsford Smith Drive	Petterd Street	EB	New On Road Cycling	2,250	$360,000	$45,000	3
Belconnen Way	Petterd Street	Kingsford Smith Drive	WB	New On Road Cycling	2,250	$360,000	$45,000	3
Belconnen Way/Barry Drive	Petterd Street	Faunce Cres	EB	Widening, New Symbols & Signs	6,230	$623,000	N/A	3
Belconnen Way/Barry Drive	Faunce Cres	Petterd Street	WB	Widening, New Symbols & Signs	6,150	$615,000	N/A	3
Ginninderra Drive	Mouat Street	Kerigan Street	NB	New On Road Cycling	6,890	$1,102,400	$137,800	2
Ginninderra Drive	Mouat Street	Kerigan Street	NB	New Symbols & Signs	3,760	N/A	$7,520	2
Ginninderra Drive	Mouat Street	Kerigan Street	NB	New Signs	1,550	N/A	$1,550	2
Ginninderra Drive	Kerigan Street	Mouat Street	SB	New On Road Cycling	7,490	$1,198,400	$149,800	2
Ginninderra Drive	Kerigan Street	Mouat Street	SB	New Symbols & Signs	980	N/A	$1,960	2
Ginninderra Drive	Kerigan Street	Mouat Street	SB	Widening, New Symbols & Signs	2,890	$289,000	N/A	2
Ginninderra Drive	Kerigan Street	Mouat Street	SB	New Signs	320	N/A	$320	2
Ginninderra Drive	Kerigan Street	Mouat Street	SB	New Symbols	520	N/A	$520	2
Southern Cross Drive	Spoffoth Street	Coulter Drive	EB	New On Road Cycling	5,540	$886,400	$110,800	3
Southern Cross Drive	Coulter Drive	Spoffoth Street	WB	New On Road Cycling	5,540	$886,400	$110,800	3
Coulter Drive	Southern Cross Drive	Belconnen Way	SB	New On Road Cycling	870	$139,200	$17,400	3
Coulter Drive Drive	Belconnen Way	Southern Cross Drive	NB	New On Road Cycling	870	$139,200	$17,400	3
Lanyon Drive	Monaro Hwy	Bridge	EB	New On Road Cycling	1,430	$228,800	$28,600	3
Lanyon Drive	Bridge	Monaro Hwy	WB	New On Road Cycling	1430	$228,800	$28,600	3
				Totals	**333,670**	**$46,132,400**	**$5,451,410**	

Off Road Paths and Routes on Minor Streets

Location	From	To	Total Length(m)	Description of Works	Length(m)	Cost ($)	Priority
TUGGERANONG							
Banks/Gordon/Conder/Isabella Plains/Monash Greenway	Box Hill Avenue	Erindale Drive	7100	New Signs	5,680	$5,680	2
				New Symols	5,680	$5,680	2
				Reconstruction/Construct New	355	$51,475	3
				Widening	1,420	$102,240	3
Greenway/Wanniassa	Erindale Drive	Sulwood Drive	5690	New Signs	4,552	$4,552	2
				New Symols	4,552	$4,552	2
				Reconstruction/Construct New	285	$41,253	3
				Widening	1,138	$81,936	2
Lake Tuggeranong/ Kambah	Lake Tuggeranong	Sulwood Drive	3050	New Signs	2,440	$2,440	2
				New Symols	2,440	$2,440	2
				Reconstruction/Construct New	153	$22,113	3
				Widening	610	$43,920	3
Calwell/Richardson/Isabella Plains	Tharwa Drive	Isabella Drive	3250	New Signs	2,600	$2,600	2
				New Symols	2,600	$2,600	2
				Reconstruction/Construct New	163	$23,563	3
				Widening	650	$46,800	3
Monash/Gowrie/Macarthur/Chisholm/Gilmore	Drakeford Drive	Isabella Drive	6280	New Signs	5,024	$5,024	3
				New Symols	5,024	$5,024	3
				Reconstruction/Construct New	314	$45,530	3
				Widening	1,256	$90,432	3
Oxley/Wanniassa	Drakeford Drive	Athllon Drive	5540	New Signs	4,432	$4,432	1
				New Symols	4,432	$4,432	1
				Reconstruction/Construct New	277	$40,165	3
				Widening	1,108	$79,776	3
WODEN VALLEY / WESTON CREEK							
Torrens/Pearce/Phillip	Sulwood Drive	Yarra Glen	5740	New Signs	4,592	$4,592	1
				New Symols	4,592	$4,592	1
				Reconstruction/Construct New	459	$66,584	3
				Widening	1,148	$82,656	3
Fisher/Waramanga/Stirling/Chapman	Sulwood Drive	Redgrave Place	5470	New Signs	4,376	$4,376	1
				New Symols	4,376	$4,376	1
				Reconstruction/Construct New	438	$63,452	3
				Widening	1,094	$78,768	2
Waramanga/Weston/Holder	Waramanga Oval	Lady Denman Drive	6700	New Signs	5,360	$5,360	1
				New Symols	5,360	$5,360	1
				Reconstruction/Construct New	536	$77,720	3
				Widening	1,340	$96,480	2
Fisher/Chifley/Lyons/Curtin	Badimara Street/Tuggeranong Parkway Underpass	Lady Denman Drive	7400	New Signs	5,920	$5,920	1
				New Symols	5,920	$5,920	1
				Reconstruction/Construct New	592	$85,840	3
				Widening	1,480	$106,560	3
Weston/Lyons	Namatjira Drive	Swan Place	2130	New Signs	1,704	$1,704	3
				New Symols	1,704	$1,704	3
				Reconstruction/Construct New	170	$24,708	3
				Widening	426	$30,672	3
Hughes	Yamba Drive Roundabout	Wisdom Street	690	New Signs	552	$552	2
				New Symols	552	$552	2
				Reconstruction/Construct New	55	$8,004	2
				Widening	138	$9,936	2
Hughes/Deakin	Yamba Drive	Adelaide Avenue	2450	New Signs	1,960	$1,960	1
				New Symols	1,960	$1,960	1
				Reconstruction/Construct New	196	$28,420	3
				Widening	490	$35,280	2
Curtin/Hughes/Deakin	Carruthers Street	Kent Street	1980	New Signs	1,584	$1,584	2
				New Symols	1,584	$1,584	2
				Reconstruction/Construct New	158	$22,968	2
				Widening	396	$28,512	2
CITY / INNER SOUTH							
Deakin/Forrest	Kent Street	Flinders Way	3880	New Signs	3,104	$3,104	2
				New Symols	3,104	$3,104	2
				Reconstruction/Construct New	776	$112,520	3
				Widening	776	$55,872	3
Lake Burley Griffen	Circumnavigating the lake		26260	New Signs	21,008	$21,008	1
				New Symols	21,008	$21,008	1
				Reconstruction/Construct New	5,252	$761,540	3
				Widening	5,252	$378,144	2
Canberra Avenue	HMAS Harman	East Basin	7820	New Signs	6,256	$6,256	1
				New Symols	6,256	$6,256	1
				Reconstruction/Construct New	1,564	$226,780	3
				Widening	1,564	$112,608	2
Griffith/Narrabundah/Kingston	Canberra Avenue	Wentworth Avenue	6080	New Signs	4,864	$4,864	1
				New Symols	4,864	$4,864	1
				Reconstruction/Construct New	1,216	$176,320	3
				Widening	1,216	$87,552	3
Morshead Drive	Airport	Molonglo River	2520	New Signs	2,016	$2,016	1
				New Symols	2,016	$2,016	1
				Reconstruction/Construct New	504	$73,080	2
				Widening	504	$36,288	2
Campbell	Molonglo River	Campbell Park Offices	2390	New Signs	1,912	$1,912	1
				New Symols	1,912	$1,912	1
				Reconstruction/Construct New	478	$69,310	3
				Widening	478	$34,416	3
Campbell/Reid	Limestone Avenue	Cooyong Street	3840	New Signs	3,072	$3,072	1
				New Symols	3,072	$3,072	1
				Reconstruction/Construct New	768	$111,360	3
				Widening	768	$55,296	3
Russell	Kings Avenue	Russell Drive	430	New Signs	344	$344	1
				New Symols	344	$344	1
				Reconstruction/Construct New	86	$12,470	3
				Widening	86	$6,192	3
Reid	Lake Burley Griffen	Blamey Crescent	1090	New Signs	872	$872	1
				New Symols	872	$872	1
				Reconstruction/Construct New	218	$31,610	3
				Widening	218	$15,696	3
Acton	Lake Burley Griffen	Barry Drive (West)	1710	New Signs	1,368	$1,368	1
				New Symols	1,368	$1,368	1
				Reconstruction/Construct New	342	$49,590	3
				Widening	342	$24,624	3
Acton	Lake Burley Griffen	Barry Drive (East)	1570	New Signs	1,256	$1,256	1
				New Symols	1,256	$1,256	1
				Reconstruction/Construct New	314	$45,530	3
				Widening	314	$22,608	3
City	Lake Burley Griffen	Cooyong Street	2340	New Signs	1,872	$1,872	1
				New Symols	1,872	$1,872	1
				Reconstruction/Construct New	468	$67,860	3
				Widening	468	$33,696	3

INNER NORTH							
Braddon/Ainslie	Cooyong Street	Hannan Crescent	3525	New Signs	2,820	$2,820	1
				New Symols	2,820	$2,820	1
				Reconstruction/Construct New	1,410	$204,450	1
				Widening	529	$38,070	2
Braddon/Dickson/Downer/Watson	Cooyong Street	Morisset Street	6660	New Signs	5,328	$5,328	1
				New Symols	5,328	$5,328	1
				Reconstruction/Construct New	2,664	$386,280	3
				Widening	999	$71,928	2
Dickson/O'Connor	Goodwin Street	Majura Avenue	2470	New Signs	1,976	$1,976	1
				New Symols	1,976	$1,976	1
				Reconstruction/Construct New	988	$143,260	3
				Widening	371	$26,676	2
Turner/O'Connor/Lyneham	Barry Drive	Gungahlin Drive	6065	New Signs	4,852	$4,852	1
				New Symols	4,852	$4,852	1
				Reconstruction/Construct New	2,426	$351,770	3
				Widening	910	$65,502	2
Turner/O'Connor/Lyneham	Barry Drive	Barton Highway	4480	New Signs	3,584	$3,584	1
				New Symols	3,584	$3,584	1
				Reconstruction/Construct New	1,792	$259,840	3
				Widening	672	$48,384	2
Turner/O'Connor	Condamine Street	Fairfax Street	2830	New Signs	2,264	$2,264	1
				New Symols	2,264	$2,264	1
				Reconstruction/Construct New	1,132	$164,140	3
				Widening	425	$30,564	2
O'Connor	Jandura Park	AIS	2765	New Signs	2,212	$2,212	1
				New Symols	2,212	$2,212	1
				Reconstruction/Construct New	1,106	$160,370	3
				Widening	415	$29,862	2
GUNGAHLIN							
Mulanggarri/Harrison/Amaroo	Morisset Road	Len Waters Street	10190	New Signs	8,152	$8,152	1
				New Symols	8,152	$8,152	1
				Reconstruction/Construct New	2,548	$369,388	3
				Widening	1,529	$110,052	3
Mitchell/Crace/Franklin/Palmerston	Barton Highway	Gundaroo Drive	5095	New Signs	4,076	$4,076	1
				New Symols	4,076	$4,076	1
				Reconstruction/Construct New	1,274	$184,694	3
				Widening	764	$55,026	3
Palmerston/Harrison	Barton Highway	Anthony Rolfe Avenue	3880	New Signs	3,104	$3,104	1
				New Symols	3,104	$3,104	1
				Reconstruction/Construct New	970	$140,650	3
				Widening	582	$41,904	3
Ngunnawl/Nicholls	Gundaroo Drive	Iterra Grove	4655	New Signs	3,724	$3,724	1
				New Symols	3,724	$3,724	1
				Reconstruction/Construct New	1,164	$168,744	3
				Widening	698	$50,274	3
Mitchell/Crace/Franklin/Palmerston (Gungahlin Drive)	Barton Highway	Gundaroo Drive	5095	New Signs	4,076	$4,076	1
				New Symols	4,076	$4,076	1
				Reconstruction/Construct New	1,274	$184,694	3
				Widening	764	$55,026	3
BELCONNEN							
Giralang/McKellar/Belconnen	Barton Highway	Emu Bank (East)	5380	New Signs	4,304	$4,304	1
				New Symols	4,304	$4,304	1
				Reconstruction/Construct New	269	$39,005	3
				Widening	807	$58,104	2
Spence/Melba/Florey/Belconnen	Clarey Crescent	Emu Bank (West)	5630	New Signs	4,504	$4,504	1
				New Symols	4,504	$4,504	1
				Reconstruction/Construct New	282	$40,818	3
				Widening	845	$60,804	2
Giralang/Kaleen/Bruce	William Slim Drive	AIS	6625	New Signs	5,300	$5,300	1
				New Symols	5,300	$5,300	1
				Reconstruction/Construct New	331	$48,031	3
				Widening	994	$71,550	2
Kaleen/Lyneham	Kaleen Tennis Club	Barton Highway	1655	New Signs	1,324	$1,324	1
				New Symols	1,324	$1,324	1
				Reconstruction/Construct New	83	$11,999	3
				Widening	248	$17,874	2
Dunlop/Charnwood/Flynn/Melba/Evatt/ McKellar/Lawson (Ginninderra Drive)	Kerigan Street	Alberga Street (Underpass)	9390	New Signs	7,512	$7,512	1
				New Symols	7,512	$7,512	1
				Reconstruction/Construct New	470	$68,078	3
				Widening	1,409	$101,412	2
Charnwood/Fraser/Spence/Evatt/ McKellar	Ginninderra Drive	William Slim Drive	7435	New Signs	5,948	$5,948	2
				New Symols	5,948	$5,948	2
				Reconstruction/Construct New	372	$53,904	3
				Widening	1,115	$80,298	2
Latham/Florey	Ginninderra Drive	Kingsford Smith Underpass	900	New Signs	720	$720	1
				New Symols	720	$720	1
				Reconstruction/Construct New	45	$6,525	3
				Widening	135	$9,720	2
Belconnen/Macquarie/Cook	Luxton Street	Bindubi Street	4145	New Signs	3,316	$3,316	1
				New Symols	3,316	$3,316	1
				Reconstruction/Construct New	207	$30,051	3
				Widening	622	$44,766	2
Belconnen	Coulter Drive	Chan Street	805	New Signs	644	$644	1
				New Symols	644	$644	1
				Reconstruction/Construct New	40	$5,836	3
				Widening	121	$8,694	2
Bruce	AIS	Haydon Drive	1610	New Signs	1,288	$1,288	1
				New Symols	1,288	$1,288	1
				Reconstruction/Construct New	81	$11,673	3
				Widening	242	$17,388	2
Belconnen/Bruce/Aranda	Lake Ginninderra (South)	Glenloch Interchange	8970	New Signs	7,176	$7,176	1
				New Symols	7,176	$7,176	1
				Reconstruction/Construct New	449	$65,033	3
				Widening	1,346	$96,876	2
Holt/MacGregor/Latham/Florey/ Belconnen	Hopman Place	Lake Ginninderra (South)	7970	New Signs	6,376	$6,376	2
				New Symols	6,376	$6,376	2
				Reconstruction/Construct New	399	$57,783	3
				Widening	1,196	$86,076	2
				Total		**$8,937,166**	

Priority	**Years to be Constructed**
1	Years 1 to 4
2	Years 5 to 7
3	Years 8 to 10

Cycle Paths and Lanes - Cost Estimates/km

On road

New 2.5m wide on existing road (Assumming twin lanes, kerbed road), No widening

Task		Cost
Site Establishment		5,000
TTMs		5,000
Eradicate Linemarking		3,000
New Linemarking		5,000
Cycling Stencils		1,000
Cycling Signs		1,000
	TOTAL	**$20,000/km**

On road

New 2.5m wide on existing road (Assumming twin lanes, kerbed road), Including widening

TOTAL **$165,000/km** **Based on Northbourne Avenue On Road Cycling**

Minor Streets

Signs Only

Task		Cost
Site Establishment		5,000
TTMs		5,000
Cycling Signs		1,000
	TOTAL	**$11,000/km**

Off road

New 2.5m wide (Assumming no underpasses or bridges)

Task		Cost	
Site Establishment		$5,000	
Sediment Control		$5,000	
TTMs		$1,000	
Earthworks		$15,000	Based on 2.5mx1000m x 0.3 @20/m3
Gravel		$75,000	Based on 2500m2 @30/m2
AC		$25,000	Based on 2500m2@10/m2
Landscaping		$5,000	
New Linemarking		$5,000	
Cycling Stencils		$1,000	
Cycling Signs		$1,000	
	TOTAL	**$138,000/km**	

Off road

Widen Existing Path(Assumming 1m wide extension)

Task		Cost	
Site Establishment		$5,000	
Sediment Control		$5,000	
TTMs		$1,000	
Earthworks		$6,000	Based on 1.0mx1000m x 0.3 @20/m3
Gravel		$30,000	Based on 1000m2 @30/m2
AC		$10,000	Based on 1000m2@10/m2
Landscaping		$5,000	
New Linemarking		$5,000	
Cycling Stencils		$1,000	
Cycling Signs		$1,000	
	TOTAL	**$69,000/km**	

APPENDIX H

Roads ACT's 2004/05 Resealing Program – Arterial Roads

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

ROADS ACT's 2004/05 RESEALING PROGRAM (Click here for main report)

ARTERIAL ROADS

ROAD NAME	FROM	TO	DIRECTION	LANE LENGTH (m)	ON ROAD CYCLING	NOMINATED AS TRUNK ROUTE
Hindmarsh Drive	Top of Hill (Ch 4980)	Ch 5865	WB	885	ORC	YES
Sulwood Drive	Sainsbury (Ch 1170)	Athllon (Ch 1570)	Both	400	ORC	
Drakeford Drive	Woodcock (Ch 700)	Hurtle (Ch 1100)	NB	400	ORC	YES
Drakeford Drive	Hurtle (Ch 1200)	Athllon (Ch 2550)	NB	1,350	ORC	YES
Tuggeranong Parkway	Hindmarsh Dr (bridge)	Entry ramp (geotextile)	SB	400	ORC	
Mugga Lane	Long Gully Lane	Asphalt Plant	Both	3,000		
Cotter Road	Bridge	Guide Signs (Streeton Dr lights)	Both	250	ORC	YES
Yamba Dr	Long Gully Ln	Beasley St	NB	2,100	ORC	YES
Yamba Dr	Beasley St	Hindmarsh (geotextile slow lane)	NB	1,700	ORC	YES
Yamba Dr	Wisdom	Kitchener	SB	600	ORC	YES
Bindubi Street	Redfern St	Bandjalong St	SB	750	ORC	
Majura Road	Ch 00 (NB)	Ch 1.65	Both	1,650	ORC	
Parkes Way	Clunies Ross U/Pass	Ramp to William Hovell Dr	WB	1,900		
TOTAL				**11,950**		

APPENDIX I

Detailed Demand Data

Ph: 6257 1466 Fax: 6247 3070
john.hughes@wpbrown.com.au

CYCLE JOURNEYS TO WORK (Click here for main report)
(Source: Census 2001 Data)

DESTINATION (columns) / ORIGIN (rows)

ID	ACTO	AINS	AMAR	ARAN	BANK	BART	BELC	BONY	BRAD	BRUC	CALW	CAMP	CHAP	CHAR	CHIF	CHIS	CITY	COND	COOK	CURT	DEAK	DICK
ACTO	3											3					6					3
AINS	35	6				4	4		11	3							24				3	1
AMAR							3										6					
ARAN	5						9			4							4				3	
BANK																		3				
BART						6																
BELC						3	8			8		3		3			3					
BONY																		3				
BRAD	16					6	3					3					16					3
BRUC							5			8							6					
CALW						3					3						3					
CAMP	17					7			3	3		3					13					3
CHAP	3					3																
CHAR																						
CHIF	3																3			3		
CHIS																						
CITY																						
COND																		4			3	
COOK	2					3	5		3	5							1					
CURT	4					10											7			3	6	
DEAK	3					6											3					
DICK	12					3				3							9				3	8
DOWN	31	3				6	4		3	4		3					15					7
DUFF	4					3	4															
DUNL						3	3															
EVAT	4						6		3	7							6				3	3
FADD																	3					
FARR																					4	
FISH						6											3					
FLOR							16		3	6				3			6				3	
FLYN							7		3	3												
FORR																						
FRAS						3	4			3												
FYSH																						
GARR						3											3					
GILM																						
GIRA	3					3	8			6							6					
GORD																3						
GOWR						3																
GREE						3																
GRIF	3					3											1					
GUNG																						
HACK	2					4			3								12					
HALL																						
HAWK						3											3					
HIGG						3	5			6							3					3
HOLD						3					3						3					
HOLT							4		3	3							3		3			
HUGH	3					3											6					
HUME																						
ISAA																	3					
ISAB						3						3					3					
KALE	16					6	5		3	6							15					6
KAMB						3	3										9				6	
KING	3					3											11					
LATH							6										3					
LYNE	34	3				12	6		3	3							24					3
LYON						3	3															
MACA																						
MACG	3						6		3	3							3					
MACQ	9					3	3			12							5					
MAWS						3																
MCKE	3																					
MELB	3						4			3							3					
MITC																						
MONA												3										
NARR	8					10											7				3	
NGUN	3						3			3							8					
NICH							7										7					
OAKS																						
OCON	68					5	15		1	8							29				3	5
OMAL																						
OXLE																						
PAGE	3						1			3												3
PALM							3			3							8					
PEAR						3														3		
PHIL												3										
PIAL							3															
REDH						6						3					3					3
REID	9						3		3								3					
RICH																					3	
RIVE	3								3								3					
SCUL	3						5										3					3
SPEN							3			3												
STIR																						
SYMO																						
THEO																	3					
TORR						3			3								6					
TURN	21					3	9										22					3
WANN	3					3											3					
WARA	3								3	3												
WATS	13					3	3		7	3							11				3	3
WEET	4						6		3	3												
WEST																	3					
YARR	3						3										12				3	3
TOTAL	368	12				178	198		67	128	6	27		6		3	387	10	3	9	49	63

ID	DOWN	DUFF	DUNL	EVAT	FADD	FARR	FISH	FLOR	FLYN	FORR	FRAS	FYSH	GARR	GILM	GIRA	GORD	GOWR	GREE	GRIF	GUNG	HACK	HALL	HAWK	HIGG	HOLD	HOLT	HUGH	HUME
ACTO																												
AINS																			3	3								
AMAR																												
ARAN																		3										
BANK																		3										
BART																												
BELC							3																			3		
BONY																	3	9										
BRAD					3							3								3								
BRUC												3																
CALW																		9										
CAMP																												
CHAP																												
CHAR																												
CHIF																												
CHIS																		3										
CITY																												
COND																		3										
COOK												3	3						3	3								
CURT													3					3							3			
DEAK																												
DICK																				3	3							
DOWN																												
DUFF																												
DUNL																												
EVAT				3																3								
FADD					3								3															
FARR																		3										
FISH																		3										
FLOR																												
FLYN																												
FORR										3																		
FRAS																												
FYSH																												
GARR													6							3								
GILM																												
GIRA	3														3													
GORD										3								6										
GOWR																		3										
GREE																		5										
GRIF										3																		3
GUNG																												
HACK																				3								
HALL																												
HAWK																							3					
HIGG																										3		
HOLD												3	3					3										
HOLT																												
HUGH																												
HUME																												
ISAA																												
ISAB																		6										
KALE																				5								
KAMB													3	3				28		3								
KING																			3									
LATH																										3		
LYNE																												
LYON													3															
MACA																												
MACG																							3			3		
MACQ															3													
MAWS										3								3										
MCKE																												
MELB																												
MITC																												
MONA																		6										
NARR												6																
NGUN													3							3								
NICH																												
OAKS																												
OCON										3		3									3							
OMAL																												
OXLE																												
PAGE																												
PALM	3																			3								
PEAR																		3										
PHIL													5					3										
PIAL																												
REDH																												
REID													3															
RICH																		5										
RIVE																		3										
SCUL																												
SPEN																												
STIR													3															
SYMO												3																
THEO																		5										
TORR													3															
TURN										3																		
WANN													3					19										
WARA																		3										
WATS																									3			
WEET								3																				
WEST										3			3															
YARR												3	3										3					
TOTAL	6			3	6		3	3		21		27	50	3	6		3	140	9	35	6		9		6	12		3

ID	ISAA	ISAB	KALE	KAMB	KING	LATH	LYNE	LYON	MACA	MACG	MACQ	MAWS	MELB	MITC	MONA	NARR	NGUN	NICH	OAKS	OCON	OMAL	OXLE	PAGE
ACTO																							
AINS			3		3									3						3			
AMAR			3																				
ARAN																							
BANK																							
BART																							
BELC																							
BONY																							
BRAD																							
BRUC																							
CALW																							
CAMP							3																
CHAP																							
CHAR																							
CHIF																							
CHIS																							
CITY																							
COND																							
COOK																							
CURT																							
DEAK																							
DICK							3																
DOWN				3			3							3									
DUFF																							
DUNL																							
EVAT													3	3									
FADD																							
FARR																							
FISH																							
FLOR																							
FLYN																							
FORR																							
FRAS																							
FYSH																							
GARR																							
GILM																							
GIRA																							
GORD																							
GOWR																							
GREE																							
GRIF																							
GUNG																							
HACK					3		3																
HALL																							
HAWK							3																
HIGG													3										
HOLD													3										
HOLT																							
HUGH																							
HUME																							
ISAA																							
ISAB																							
KALE			4											3									
KAMB																							
KING																							
LATH																							
LYNE							8							3									
LYON																							
MACA																							
MACG																							
MACQ											3												
MAWS							3																
MCKE																							
MELB																							
MITC																							
MONA		3																					
NARR																							
NGUN							3										3	3					
NICH																							
OAKS																							
OCON							3									3				3			
OMAL																							
OXLE											3												
PAGE			3																				
PALM																							
PEAR																							
PHIL																							
PIAL																							
REDH																							
REID																							
RICH																							
RIVE																							
SCUL							3																
SPEN					3																		
STIR																							
SYMO																							
THEO																							
TORR																							
TURN							3																
WANN																							
WARA																							
WATS							3				3			3									
WEET																							
WEST																							
YARR							3																
TOTAL		3	13	3	9		44				9		9	18		3	3	3		6			

ID	PARK	PALM	PEAR	PHIL	PIAL	REDH	REID	RICH	RIVE	RUSS	SCUL	SPEN	STIR	SYMO	THEO	TORR	TURN	WANN	WARA	WATS	WEET	WEST	YARR	Total	ID
ACTO														3										18	ACTO
AINS	8						3			8										6				134	AINS
AMAR		3																						15	AMAR
ARAN										4				3										35	ARAN
BANK										3														9	BANK
BART																								6	BART
BELC																								34	BELC
BONY																						3		18	BONY
BRAD	3									5												3		67	BRAD
BRUC										3														25	BRUC
CALW	3																							21	CALW
CAMP	6													3			3						3	67	CAMP
CHAP																								6	CHAP
CHAR																									CHAR
CHIF																							3	12	CHIF
CHIS	3			3						3														12	CHIS
CITY	3																							3	CITY
COND																								10	COND
COOK	3									3				3								3		43	COOK
CURT	3			3			3			3														51	CURT
DEAK				3																				15	DEAK
DICK	6									3							3							59	DICK
DOWN	6						3							3						3				100	DOWN
DUFF	3									3				3								3		23	DUFF
DUNL										3														9	DUNL
EVAT										3				3										50	EVAT
FADD																								9	FADD
FARR																								7	FARR
FISH										3														15	FISH
FLOR	3						3			3														46	FLOR
FLYN																								13	FLYN
FORR										3														6	FORR
FRAS																								10	FRAS
FYSH																									FYSH
GARR										3														18	GARR
GILM																									GILM
GIRA																								32	GIRA
GORD																								12	GORD
GOWR										3								3						12	GOWR
GREE																								8	GREE
GRIF	3									3							3					3		25	GRIF
GUNG																									GUNG
HACK	3																			3				36	HACK
HALL																									HALL
HAWK										3							3							18	HAWK
HIGG																								26	HIGG
HOLD	3																					3		27	HOLD
HOLT										3														19	HOLT
HUGH	6									3														21	HUGH
HUME																									HUME
ISAA	3																							6	ISAA
ISAB	3																							18	ISAB
KALE										3														72	KALE
KAMB				3		3				4				3				6						77	KAMB
KING	3									3				3										29	KING
LATH																								12	LATH
LYNE	12									7				3			3						3	127	LYNE
LYON																								9	LYON
MACA																									MACA
MACG																								24	MACG
MACQ																							3	41	MACQ
MAWS										3														15	MAWS
MCKE																								3	MCKE
MELB	3																							16	MELB
MITC																									MITC
MONA			3							3							3							21	MONA
NARR	8					3				4				4			3							56	NARR
NGUN						3				3														38	NGUN
NICH										4							3							21	NICH
OAKS																									OAKS
OCON	11						3										3			3			5	177	OCON
OMAL																									OMAL
OXLE																								3	OXLE
PAGE																								13	PAGE
PALM	3									3													3	29	PALM
PEAR														3									3	15	PEAR
PHIL	3																							14	PHIL
PIAL																								3	PIAL
REDH	3																						3	21	REDH
REID	3																							24	REID
RICH																								8	RICH
RIVE										3														15	RIVE
SCUL																								17	SCUL
SPEN																								9	SPEN
STIR																						3		6	STIR
SYMO																								3	SYMO
THEO														3										11	THEO
TORR																3								18	TORR
TURN	5									3														72	TURN
WANN										4												3		38	WANN
WARA	3													3								3		21	WARA
WATS	3						3			3				3						3		3		76	WATS
WEET																								19	WEET
WEST				3						4														16	WEST
YARR	8						3																3	50	YARR
TOTAL		3	3	15		9	21							46		3	27	9		18		30	29		TOTAL

FORECAST FUTURE (2013) CYCLE JOURNEYS TO WORK

DESTINATION (columns) / ORIGIN (rows)

ID	ACTO	AINS	AMAR	ARAN	BANK	BART	BELC	BONY	BRAD	BRUC	CALW	CAMP	CHAP	CHAR	CHIF	CHIS	CITY	COND	COOK	CURT	DEAK	DICK	DOWN	DUFF
ACTO	4											9					9					3		
AINS	42	7				5	5		12	4							32				3	1		
AMAR							5										12							
ARAN	6						11			5							5				3			
BANK																		5						
BART						19																		
BELC						9	24			25		20		9			10							
BONY																		4						
BRAD	25					9	5					10					28					4		
BRUC							8			14							11							
CALW						3					3						4							
CAMP	20					8			3	4		8					17					3		
CHAP	3					3																		
CHAR																								
CHIF	4																4			3				
CHIS																								
CITY																								
COND																		6			4			
COOK	2					4	6		3	6							1							
CURT	5					11											9			3	6			
DEAK	4					7											4							
DICK	16					4				4							14				4	10		
DOWN	35	3				7	5		3	5		8					19					7		
DUFF	5					3	5																	
DUNL						8	9																	
EVAT	5						7		3	8							8				3	3		
FADD																	4							
FARR																					4			
FISH						7											4							
FLOR							19		3	7				3			8				3			
FLYN							8		3	4														
FORR																								
FRAS						3	5			4														
FYSH																								
GARR						4											4							
GILM																								
GIRA	4					3	9			7							8						4	
GORD																4								
GOWR						3																		
GREE						10																		
GRIF	4					4											2							
GUNG																								
HACK	2					5			3								16							
HALL																								
HAWK						56											64							
HIGG						3	6			7							4					3		
HOLD						3					3						4							
HOLT							5		3	4							4		4					
HUGH	4					3											8							
HUME																								
ISAA																	4							
ISAB						3						8					4							
KALE	18					7	6		3	7							19					6		
KAMB						3	3										12				6			
KING	10					9											40							
LATH							7										4							
LYNE	41	4				14	7		3	4							32					3		
LYON						4	4																	
MACA																								
MACG	3						7		3	4							4							
MACQ	12					4	4			16							7							
MAWS						4																		
MCKE	4																							
MELB	3						5			4							4							
MITC																								
MONA												8												
NARR	10					12											9				3			
NGUN	4						4			4							12							
NICH							10										11							
OAKS																								
OCON	83					6	18		1	10							39				3	6		
OMAL																								
OXLE																								
PAGE	4						1			4												3		
PALM							4			4							10						4	
PEAR						3														3				
PHIL												15												
PIAL							3																	
REDH						7						8					4					3		
REID	11						4		3								4							
RICH																					3			
RIVE	3								3								4							
SCUL	3						6										4					3		
SPEN							4			4														
STIR																								
SYMO																								
THEO																	4							
TORR						3			3								7							
TURN	33					5	14										38					4		
WANN	3					3											4							
WARA	3								3	4														
WATS	22					5	5		11	5							21				5	5		
WEET	5						7		3	4														
WEST																	4							
YARR	3						4										16				3	3		
TOTAL	467	14	0	0	0	296	267	0	76	180	7	93	0	12	0	4	636	15	4	10	56	72	7	0

ID	DUNL	EVAT	FADD	FARR	FISH	FLOR	FLYN	FORR	FRAS	FYSH	GARR	GILM	GIRA	GORD	GOWR	GREE	GRIF	GUNG	HACK	HALL	HAWK	HIGG	HOLD	HOLT
ACTO																								
AINS																	3	17						
AMAR																								
ARAN																3								
BANK																5								
BART																								
BELC					10																			9
BONY															4	11								
BRAD			5							4								22						
BRUC										5														
CALW																10								
CAMP																								
CHAP																								
CHAR																								
CHIF																								
CHIS																3								
CITY																								
COND																5								
COOK										4	4						3	17						
CURT											3					3							3	
DEAK																								
DICK																		19	4					
DOWN																								
DUFF																								
DUNL																								
EVAT		3																16						
FADD			3								3													
FARR																3								
FISH																3								
FLOR																								
FLYN																								
FORR								5																
FRAS																								
FYSH																								
GARR											7							18						
GILM																								
GIRA													3											
GORD								5								8								
GOWR																3								
GREE																17								
GRIF								5																
GUNG																								
HACK																		17						
HALL																								
HAWK																					56			
HIGG																								3
HOLD										3	3					3								
HOLT																								
HUGH																								
HUME																								
ISAA																								
ISAB																7								
KALE																		27						
KAMB											3	4				32		16						
KING																	9							
LATH																								3
LYNE																								
LYON											4													
MACA																								
MACG																					3			3
MACQ													4											
MAWS								4								4								
MCKE																								
MELB																								
MITC																								
MONA																7								
NARR										7														
NGUN											4							19						
NICH																								
OAKS																								
OCON								4		4									4					
OMAL																								
OXLE																								
PAGE																								
PALM																		16						
PEAR																4								
PHIL											10					6								
PIAL																								
REDH																								
REID											3													
RICH																6								
RIVE																3								
SCUL																								
SPEN																								
STIR											3													
SYMO										20														
THEO																6								
TORR											3													
TURN								5																
WANN											3					22								
WARA																3								
WATS																							5	
WEET						3																		
WEST								4			3													
YARR										3	3										3			
TOTAL	0	3	8	0	10	3	0	32	0	50	62	4	7	0	4	178	15	205	8	0	63	0	8	18

ID	HUGH	HUME	ISAA	ISAB	KALE	KAMB	KING	LATH	LYNE	LYON	MACA	MACG	MACQ	MAWS	MELB	MITC	MONA	NARR	NGUN	NICH	OAKS	OCON	OMAL	OXLE
ACTO																								
AINS					4		4									4						1		
AMAR					5																			
ARAN																								
BANK																								
BART																								
BELC																								
BONY																								
BRAD																								
BRUC																								
CALW																								
CAMP									3															
CHAP																								
CHAR																								
CHIF																								
CHIS																								
CITY																								
COND																								
COOK																								
CURT																								
DEAK																								
DICK									4															
DOWN						3			3							4								
DUFF																								
DUNL																								
EVAT															4	4								
FADD																								
FARR																								
FISH																								
FLOR																								
FLYN																								
FORR																								
FRAS																								
FYSH																								
GARR																								
GILM																								
GIRA																								
GORD																								
GOWR																								
GREE																								
GRIF		5																						
GUNG																								
HACK							4		4															
HALL																								
HAWK									57															
HIGG															4									
HOLD															4									
HOLT																								
HUGH																								
HUME																								
ISAA																								
ISAB																								
KALE					5											4								
KAMB																								
KING																								
LATH																								
LYNE									9							4								
LYON																								
MACA																								
MACG																								
MACQ													4											
MAWS									4															
MCKE																								
MELB																								
MITC																								
MONA				3																				
NARR																								
NGUN									4										4	4				
NICH																								
OAKS																								
OCON									4									4				1		
OMAL																								
OXLE													3											
PAGE					4																			
PALM																								
PEAR																								
PHIL																								
PIAL																								
REDH																								
REID																								
RICH																								
RIVE																								
SCUL									3															
SPEN							4																	
STIR																								
SYMO																								
THEO																								
TORR																								
TURN									5															
WANN																								
WARA																								
WATS									5				5			6								
WEET																								
WEST																								
YARR									3															
TOTAL	0	5	0	3	17	3	12	0	108	0	0	0	11	0	11	25	0	4	4	4	0	2	0	0

ID	PAGE	PALM	PARK	PEAR	PHIL	PIAL	REDH	REID	RICH	RIVE	RUSS	SCUL	SPEN	STIR	SYMO	THEO	TORR	TURN	WANN	WARA	WATS	WEET	WEST	YARR	TOTAL	ID
ACTO															3										28	ACTO
AINS			8					4			10										7				154	AINS
AMAR		6																							28	AMAR
ARAN											1				3										37	ARAN
BANK											0														10	BANK
BART																									19	BART
BELC																									115	BELC
BONY																							4		23	BONY
BRAD			4								7												5		116	BRAD
BRUC											1														38	BRUC
CALW			3																						21	CALW
CAMP			6												3			3						3	75	CAMP
CHAP																									7	CHAP
CHAR																									0	CHAR
CHIF																								3	14	CHIF
CHIS			3		3						0														7	CHIS
CITY			13																						0	CITY
COND																									15	COND
COOK			4								0				3								4		58	COOK
CURT			3		3			4			1														50	CURT
DEAK					4																				19	DEAK
DICK			7								1							4							84	DICK
DOWN			6					4							3						3				112	DOWN
DUFF			3								0				3								3		19	DUFF
DUNL											0														17	DUNL
EVAT											0				3										67	EVAT
FADD																									10	FADD
FARR																									7	FARR
FISH											0														14	FISH
FLOR			3					4			0														47	FLOR
FLYN																									15	FLYN
FORR											2														5	FORR
FRAS																									11	FRAS
FYSH																									0	FYSH
GARR											1														33	GARR
GILM																									0	GILM
GIRA																									39	GIRA
GORD																									16	GORD
GOWR											0								3						10	GOWR
GREE																									27	GREE
GRIF			3								4							4					4		27	GRIF
GUNG																									0	GUNG
HACK			3																		3				54	HACK
HALL																									0	HALL
HAWK											0							58							291	HAWK
HIGG																									30	HIGG
HOLD			3																				3		28	HOLD
HOLT											0														20	HOLT
HUGH			6								1														15	HUGH
HUME																									0	HUME
ISAA			3																						4	ISAA
ISAB			3																						22	ISAB
KALE											1														102	KALE
KAMB					3		3				2				3				6						96	KAMB
KING			9								15				9										76	KING
LATH																									14	LATH
LYNE			12								2				3			4						3	131	LYNE
LYON																									11	LYON
MACA																									0	MACA
MACG																									28	MACG
MACQ																								4	54	MACQ
MAWS											0														15	MAWS
MCKE																									4	MCKE
MELB			3																						16	MELB
MITC																									0	MITC
MONA				3							0							3							25	MONA
NARR			8				3				4				4			4							52	NARR
NGUN							4				1														64	NGUN
NICH											1							4							26	NICH
OAKS																									0	OAKS
OCON			11					4										4			4			6	204	OCON
OMAL																									0	OMAL
OXLE																									3	OXLE
PAGE																									15	PAGE
PALM			3								0													3	41	PALM
PEAR															3									3	17	PEAR
PHIL			5																						31	PHIL
PIAL																									3	PIAL
REDH			3																					3	26	REDH
REID			3																						25	REID
RICH																									9	RICH
RIVE											0														14	RIVE
SCUL																									20	SCUL
SPEN																									11	SPEN
STIR																							3		7	STIR
SYMO																									20	SYMO
THEO															3										12	THEO
TORR																	3								20	TORR
TURN			6								1														104	TURN
WANN											1												3		39	WANN
WARA			3												3								3		20	WARA
WATS			4					6			1				5						5		5		118	WATS
WEET																									22	WEET
WEST					3						1														14	WEST
YARR			8					4																3	50	YARR
TOTAL	0	6		3	17	0	11	29	0	0		0	0	0	55	0	3	88	10	0	22	0	38	33		TOTAL