



Muswellbrook Shire Council

Walk and Cycle Plan for Muswellbrook and Denman



Final Report

STRATEGIC LEISURE GROUP LEISURE PLANNING + MANAGEMENT CONSULTANTS

March 2009

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1. INTRODUCTION

1.1. STUDY BACKGROUND

Muswellbrook Shire is located in the Upper Hunter Region of New South Wales (NSW), approximately 230km north-west of Sydney and 130km north-west of Newcastle. The Shire has a total area of 3,402km² and a current population of about 15,000. The main urban centre is Muswellbrook, with a smaller township at Denman and several smaller villages.

As part of Muswellbrook Shire Council's commitment to achieve a safer, integrated and sustainable transport system, it prepared walking and cycling network strategies for the communities of Muswellbrook and Denman in the 1990's. These studies provided the catalyst for focussed local area planning and pathway construction.

In more recent years, the pressures of population growth and change, new residential subdivisions, and a growing awareness of active and healthy living, have prompted the need for a more contemporary network strategy.

On this basis, Council commissioned consultants, the Strategic Leisure Group, to prepare the new Walk & Cycle Plan for Muswellbrook & Denman.

Given their size and existing pathway coverage, Muswellbrook and Denman are generally well suited to walking and cycling. Council and the community can expect positive outcomes from ongoing investment in the walk and cycle network. These will range from health and safety improvements, to mobility, environmental and lifestyle benefits.

1.2. STUDY PURPOSE AND SCOPE

The overall purpose of this study is:

To formulate a realistic, connective and safe network of walking and cycling facilities, supported by a prioritised schedule of works.

It focuses on trip patterns, infrastructure location and implementation, as well as integration with the road network, open space system and land use fabric.

Major outcomes of this study are:

- Assessment of existing conditions for walking and cycling.
- An updated strategy to guide Council's development of the pedestrian and cycle network in Muswellbrook and Denman over the next 10 years.

Prioritised implementation plan to provide a logical and coordinated staging of proposed works.

This study is intended to provide a "**strategic framework**" or starting point from which more detailed investigations can be conducted by Council in future, including preparation of design standards, infrastructure costing and community consultation.

1.3. STUDY PROCESS

The study process comprised six integrated stages:

Stage 1: Project Inception and Data Gathering

- Inception meeting with Council's Project Manager and other relevant officers.
- Collection and review of background information and previous studies to set the Plan in context.

Stage 2: Review of Existing Conditions for Walking and Cycling

- Review of existing walking and cycling environments in Muswellbrook and Denman, considering land use patterns, road network, travel trends, crash statistics and facility audits.
- Preliminary site inspections to visually assess local conditions and existing facilities (pathway standards, coverage, safety etc).
- Confirmation of major trip generators and attractors to identify the "magnets" for walking and cycling activity.
- Review of population data and future forecasts to identify implications for walking and cycling demand in Muswellbrook and Denman.

Stage 3: Consultation with Council and the Roads & Traffic Authority (RTA)

- Project briefing presentation to Muswellbrook Shire Council.
- Discussions with key Council officers to identify critical issues, opportunities and constraints for network planning.
- Discussions with the Roads & Traffic Authority (Hunter Region) regarding improvements for walking and cycling on State Controlled Roads.

Stage 4: Survey of Schools

Surveys inviting input from local primary schools and Muswellbrook High School to determine problem areas, safety issues and infrastructure priorities in school zones.

Stage 5: Network Planning and Priorities

- Synthesis of background research and stakeholder feedback.
- Preliminary network planning of walk and cycle routes in the study area, including new and upgraded facilities.
- Site investigations to evaluate suitability of proposed routes.
- Refinement of the network.

Stage 6: Strategy Preparation

- Preparation of the Draft Walk & Cycle Plan including 10 Year Implementation Plan for proposed works.
- Submission of Draft Plan to Muswellbrook Shire Council for review and comment.
- Project finalisation.
- Implementation by Council.



Figure 1 – Study Process

1.4. STUDY AREA

The scope of this study focuses on the urban areas of Muswellbrook and Denman townships.

Muswellbrook

Muswellbrook is located on the Hunter River and is the Shire's primary urban centre, with a current population of approximately 10,000 persons. Muswellbrook is serviced by a broad range of community facilities and services, including five schools and TAFE college. The town is expanding to the outer south, east and north, with future residential development earmarked for these areas (subject to approvals).

Muswellbrook is an expanding service centre due to the employment opportunities provided by the eight coalmines in the district, the presence of the Liddell and Bayswater Power Stations, and a flourishing wine grape industry¹.

<u>Denman</u>

Denman is a small centre servicing the western part of Muswellbrook Shire. The town is located about 25km west of Muswellbrook and has a current population of about 1,500 persons. The town's main community focal points are the business centre (Ogilvie Street), two schools, hospital, retirement village, and Denman Recreation Area.

There are also many agricultural ventures nearby. Although the Denman area was once known for its dairy farms, horse and cattle studs, in more recent times, there has been significant growth in local vineyards and associated tourism activity.

¹ www.walkabout.com.au

Figure 2 – Study Area

Muswellbrook Township and Surrounds





Denman Township and Surrounds

2. STRATEGIC CONTEXT

A number of Council's previous plans and strategies have informed this study, most notably the *Shared Pedestrian & Cycle Paths for Muswellbrook (1998)* and *Denman Cycleway Plan (1991)*.

A summary of these documents is presented below to help "set the scene" for the new Walk & Cycle Plan.

2.1. SHARED PEDESTRIAN AND CYCLE PATHS FOR MUSWELLBROOK, 1998

This provided a 10 year plan for the provision of shared pedestrian and cycle facilities in the Muswellbrook urban area. The overall goal of the strategy was:

"To provide a system of pathways and to provide safe, convenient access for residents as well as a recreational facility."



This goal was underpinned by five objectives:

- To progressively extend the existing pathway system and complete it within 10 years.
- To give preference to development of pathways near schools and major sporting facilities.
- To provide a system of recreational pathways.
- To seek funding assistance wherever possible.
- To provide the basis for planning of pathways in new subdivision areas including provision for Section 94 Charges.

The Plan comprised a Program of Work for completion over a 10 year period. This was supported by three standard design treatments for on-road and off-road facilities based on *Austroads* guidelines², namely:

- On-road bicycle lanes (with shared parking);
- On-road bicycle lanes (exclusive/ no parking); and
- Off-road cycle paths (shared or exclusive).

The recommended network is shown in Figure 3. It utilised local roads (for on-road and off-road facilities) and public open space. It also capitalised on the use of reserves adjacent to natural waterways, which offered flat grades and ample space to develop recreational pathway circuits.

² Austroads Guide to Traffic Engineering Practice – Part 14, Bicycles





2.2. DENMAN CYCLEWAY PLAN, 1991

This Plan was developed in 1991 to provide direction for the future development of bicycle facilities in the Denman urban area.

It recommended a local area network of new and upgraded bikeways, including engineering concepts for on-road and off-road improvements, cost estimates and staging of works.

The key drivers for the plan were to improve cycling conditions and safety, coinciding with Denman's population growth and increasing traffic volumes.



Key target groups or high priorities for Plan implementation were:

- Children riding to school; and
- People riding to local sports facilities and the town's commercial area on Ogilvie Street.

The 1991 Plan recommended seven key routes for the Denman bicycle network, as follows:

- Stage 1 Virginia St.
- Stage 2 Paxton St.
- Stage 3 Ogilvie St.
- Stage 4 Virginia St Culvert, Turtle St and Macauley St.
- Stage 5 North Denman Park.
- Stage 6 Arbor Park.
- Stage 7 Denman Creek / Paxton St.

Although some projects have not been implemented, the 1991 Plan has guided network construction in Denman with pathways now servicing much of the township's central area.

2.3. OTHER BACKGROUND INFORMATION

Building on these two strategies, a number of other key planning and policy documents have been reviewed to inform this Walk & Cycle Plan. They are:

- Making Muswellbrook Shire Strategic Plan 2004-2006.
- Muswellbrook Local Environmental Plan 2008 (Public Exhibition Draft).
- Muswellbrook Shire Social Plan 2005-2010.
- Muswellbrook Traffic Study & Roadworks Plan, September 2008.
- West Denman Road Strategy, 2006 (Ver04).

The final three documents are most relevant to this study, as outlined below.

Muswellbrook Shire Social Plan 2005-2010

This study demonstrates the community's need for improved accessibility via local pathways. Of particular relevance, key issues and needs identified for specific groups were:

Children

Increase accessibility of local parks, playgrounds and schools for people with disabilities, mothers with
prams and children on bikes by establishing footpaths.

Young People

• Transport is one of the main limitations for young people accessing some of the available recreational facilities in Muswellbrook or neighbouring areas.

Older People

- The condition and provision of footpaths are a major problem for older people and people with a
 disability, particularly uneven surfaces, gutters, and lack of safe crossing points on major roads.
- Existing pathway conditions or lack of provision is a barrier to access facilities/ services for some sectors of the community.
- Need to encourage a healthy lifestyle for older people, particularly walking.
- Ensure future developments and residential expansion areas have adequate pedestrian access.

Muswellbrook Traffic Study & Roadworks Plan

The objectives of this study were to:

- Understand traffic growth and the need for management and infrastructure development in the Muswellbrook urban area; and
- Develop a traffic strategy for Council to manage the impacts of development in the Muswellbrook urban area, covering developer contributions, traffic management and road safety.

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It includes a proposed 5 year works program to address future capacity and safety concerns. This also briefly considered pedestrian safety. Importantly, this study provided insight to future road network planning and augmentation for Muswellbrook's urban area.

West Denman Road Strategy

This strategy was prepared to support Council's review of the Muswellbrook Shire LEP. It specifically focuses on an area west of the rail line and north of the Denman Recreation Area, earmarked for possible future development.

As illustrated overleaf, the document identifies required road network extensions and upgrades, together with new cycleways, to support the town expansion area. Importantly, the strategy notes that:

"The development of this area will very much depend on mining and other industries developing in the Shire and on future demographic trends both locally, regionally and statewide."

Project	Description	Cost
Turner St (Ogilvie – Bell)	2.0m concrete cycleway	\$50,000
Bell St (Almond – Pony Club)	2.0m concrete cycleway	\$80,000
Bell St (Turner – Almond)	2.0m concrete cycleway	\$20,000
Almond St (Bell – Bray)	2.0m concrete cycleway	\$40,000
Almond St (Bray – Kenilworth)	2.0m concrete cycleway	\$35,000
Bray St (Almond – Turner)	2.0m concrete cycleway	\$20,000
Turner St (Bray – Kenilworth) incl. railway crossing	2.0m concrete cycleway	\$50,000
Pine Ridge Rd for the length of development	2.0m concrete cycleway	\$150,000
	\$445,000	

The strategy recommends eight cycleway projects for West Denman, as follows:



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3. WALKING AND CYCLING ENVIRONMENT

3.1. EXISTING PATHWAYS AND BIKEWAYS

The purpose of this section is to provide a "snapshot" of existing provision and conditions for walking and cycling in Muswellbrook and Denman. Although both communities exhibit different levels of network construction, they are generally well serviced by local pathways – this provides a good starting point for future network extensions and improvements. Existing networks are primarily off-road systems which are quite fragmented. The provision of formal on-road bikeways is limited in both communities.

The extent of the existing pathway and bikeway network is described below and shown in Figures 4 to 6. These observations are based on:

- Brief review of facility audit information compiled by Council;
- Site investigations and route suitability assessments conducted by the study team; and
- Discussions with Council officers and other stakeholders.

3.1.1. **MUSWELLBROOK**

Muswellbrook's path network covers a total distance of approximately 30km. Key branches of the network connect the CBD to surrounding residential areas via Maitland, Sydney and Bridge Streets. Localised networks have been also established within Northside and Southside communities. These comprise:

- Short, discontinuous stretches of concrete footpaths of varying widths, particularly radiating from local schools.
- Recreational paths and trails meandering through parkland reserves.
- Limited network legibility due to a lack of signage and connectivity.

Most paths are 1m-2m wide and are concrete. A large majority are designed to cater for pedestrians only, rather than shared facilities. To date, there is no formal provision for full on-road bike lanes in Muswellbrook, with the exception of some bike lane signs.

Muswellbrook CBD

The highest concentration of pathways are located in the CBD where most pedestrian activity occurs. The main street, Bridge Street, is a north-south corridor with pathways (both sides), four lane carriageway with centre median and high on-street parking demand.

Existing conditions for *pedestrians* are characterised by:

- Pleasant walking environment with 5m wide paved pathways separated from road traffic.
- Comfortable movement paths shaded by awnings and large street trees.
- Some outdoor dining areas and rest stops.
- Provision for ramps at crossing points for strollers and wheelchairs.
- Signalised intersections with pedestrian phase at major junctions e.g. Brook Street.
- Pedestrian crossings of the rail line provided at William and Brook Streets.

Cyclists appear to utilise pathways which increase conflict potential with pedestrians, and also share the road with high volumes of through traffic and parked vehicles. The rail underpass south of the CBD is a major squeeze point for on-road cycling. Dispersed residential development west of Bridge Street is not well serviced by pathways, however, demand for such facilities appears to be low and grass verges are adequate for off-road access over short distances.



High pedestrian activity on Bridge Street



Pathways shared by cyclists



High vehicle movements and on-street parking demand

Southside

Muswellbrook's pathway coverage is relatively limited south of Maitland Street, however, network development is progressively occurring with new residential subdivisions and commercial projects. The principal pathway corridors in this community are located on Sydney Street, Lorne Street, Rutherford Road, Osborn Avenue and Bimbadeen Drive.

Underserviced areas are evident in older neighbourhoods adjacent to Sydney Street and Skellatar Stock Route. This precinct is characterised by limited path continuity with many "missing links", compounded by the circuitous nature of the local road network and reduced convenience for pedestrians and cyclists. Existing paths are mainly concrete construction to a width of 1m-1.2m. Many of the newer paths are sufficiently wide to provide a shared facility for different user groups (e.g. Osborn Ave).

Poor conditions along Skellatar Stock Route are particularly problematic for cyclists and pedestrians, including children accessing St James Primary School.

Substantial pathway development has occurred in the Rutherford Road precinct to service the Muswellbrook Fair catchment. This is well supported by a park-based system through Kurrajong Reserve. A good level of service is also evident in the newer residential areas such as Eastbrook Links Estate.

Although there are no formal provisions for on-road cycling, several corridors offer sufficiently wide road reserves to safely cater for both on-street parking demand and bicycle access e.g. Sydney Street, Bimbadeen Drive.

Apart from the CBD, Bell Street provides the town's main north-south access point for cyclists, pedestrians and motorists. Bell Street is a designated as an industrial access detour with 40km/h speed environment. It also services a number of major education nodes including the high school, Muswellbrook South Public School and the TAFE college. Provisions for pedestrian/ cycle access include controlled crossing points, wide shared path and separated rail overpass, which connect to a zebra crossing at Victoria Street on the northern side.



Sydney St - Existing paths and bike lane signage



Sydney St - Cyclist utilising wide kerbside lane



Woollybutt Way - Path access to Muswellbrook Fair

Northside

The Northside's pathway network has largely evolved in linear open space reserves (Karoola Park, Verdelho Reserve and The Common). These include both sealed concrete paths and unsealed trails, mostly extending eastwest through residential catchments. The condition of park-based paths is varied in terms of surface guality, width and visibility. In these locations, personal safety is a concern for path and trail users, particularly in low light situations - there are several examples where paths/ trails are isolated, not heavily used, separated from nearby development or visually obscured by overgrown vegetation.

Other pathway systems are concentrated around school campuses, notably Brook Street (servicing the high school), and a new facility on Cook Street near Muswellbrook Primary School. There is an absence of good northsouth pathway connections.

Local topographic constraints have significantly influenced network development on the Northside, together with winding roads and a high number of cul-de-sacs in the Wine Estate residential precinct. The nature of this subdivision prevents direct or near-direct trip lines, making walking and cycling inefficient and unattractive ways of moving around.

Like the Southside, a number of road corridors offer generous widths suitable for on-road bikeway treatments to service commuters e.g. Brook Street, Cook Street.

Opportunities and Constraints

In future, key opportunities to create enhanced conditions for walking and cycling in Muswellbrook should consider:

Consolidation of the Existing Pathway Network:

Existing pathway coverage provides a good framework for network consolidation and extension. Existing "missing links" or "gaps" in the network will be the priority to improve access and connectivity.

Cook St - School path and indented parking

Bell Street - Separated rail overpass for peds/ cyclists





■ Road Reserve Width / Available Space:

A number of roads through Muswellbrook's urban area have ample on-street space with wide road shoulders and/ or low traffic volumes to accommodate parking and on-road bikeways e.g. Sydney, Maitland, Cook Streets. These routes have good potential to formalise bicycle access in the road space for cross-town and CBD access.

■ Future Town Growth:

Town growth presents a strategic opportunity for extension of the walk and cycle network. It is desirable that pathways and bikeways in Muswellbrook be concurrently developed with residential subdivision projects. Council's development approval process provides a valuable opportunity to ensure a coordinated approach is taken to integrate pathways and bikeways as new development occurs.

Future road improvements by Council and the RTA will also provide opportunities for enhanced pedestrian and cycle movements e.g. new signalised intersections on Maitland Street, planned upgrade of Skellatar Stock Route.

Major constraints for walking and cycling in Muswellbrook will be:

Barriers to Movement:

Major road corridors such as the New England Highway represent obstacles or "barriers" to movement for non-motorised modes, particularly young pedestrians and cyclists. North-south access across Muswellbrook is also restricted by the rail line, Muscle Creek and Hunter River, given the limited number of safe crossing points.

Vehicular bridges and the rail underpass are also constraints, as they form "squeeze points" where the carriageway narrows, forcing cyclists into the stream of vehicular traffic flow. In some cases, no provision is made for separated pedestrian access e.g. Kayuga Bridge (see photo).



Topography:

While Muswellbrook's topographic diversity provides good scenic qualities, it is not very pedestrian or bicycle friendly in certain locations. Some Northside and Southside neighbourhoods are quite hilly or access to them requires travelling over steep terrain which can be a disincentive.

Land Ownership:

The unavailability of certain areas due to land ownership or land use can restrict walking and cycling activity. The Muswellbrook Golf Course is an example of private land ownership which constrains north-south movement. It is evident that unregulated public access of the golf course is occurring between Thompson and Bell Streets. Negotiation and compromise with the land owner could be considered to make the area more accessible if it is determined that a pathway would provide community benefit.

Personal Safety:

Many existing pathways are located in park reserves. Some heavily vegetated and secluded areas are problematic from a public safety perspective, particularly for children and females. Integration of CPTED principles (Crime Prevention Through Environmental Design) should be a critical consideration in future, to increase the sense of security within these corridors. Where possible, park-based paths should not be located out of public view, to maximise natural surveillance. More frequent vegetation management is also desirable.





MUSWELLBROOK SHIRE COUNCIL

Walk and Cycle Plan for Muswellbrook and Denman

FIGURE 4 - Existing Paths and Community Focal Points [Muswellbrook CBD and Northside]

Note:

Existing pathways and major trails are current as at February 2009.
 Map excludes paths recorded on MSC's database where width = 0, or where facility type is described as "Footway (Kerb & Channel Only)", or where "No Pedestrian Access Provided"



3.1.2. **DENMAN**

Denman is very well suited to walking and cycling, given the short distances between community focal points, flat topography, lower traffic volumes and speed environment. Furthermore, Denman's road network is based on a grid pattern, providing parallel route opportunities for cyclists and pedestrians.

Denman has good pathway coverage and connectivity extending approximately 5km, with a major recreational path running north-south along Sandy Creek (between Turtle and Macauley Streets).

The existing network mainly comprises *off-road* pathway systems, together with an *on-road* bicycle route along Virginia Street to Denman Public School. Although conditions in Denman are generally conducive to on-road cycling, this is not a suitable measure for primary school access.

Pathways are generally concrete or asphalt construction, with an average width of 1.2m-1.5m. Wider paths are provided along the main street (Ogilvie Street), Sandy Creek and around local schools (Paxton Street).

Pathways radiate north and south, although there is some network fragmentation between the town centre, Denman Recreation Area and western residential precinct separated by the rail corridor. Pathway coverage is also limited to the town's northern end and southern growth area, in the vicinity of Rosemount Road.

Cracking and other structural deterioration of paths is problematic in several locations, particularly on Palace Street near St Joseph's School. The network is not supported by directional, warning and other route signage.





Crinoline St - Existing pathway



Palace St - Significant path deterioration

Virginia St - On-road bike route to school



Almond St (western side of rail line) - no formal provision so pedestrians utilise road shoulder

Main Street Precinct

Denman's "main street" precinct, Ogilvie Street, provides a pleasant, comfortable and safe environment for pedestrians and cyclists.

Existing conditions for pedestrians are characterised by:

- Wide sealed and paved pathways on both sides of the street which are generally well constructed and maintained.
- Buildings in human scale with awnings and street trees providing shade.
- Streetscape elements, building character and landscaping have good visual amenity which enhance the pedestrian environment.

Existing conditions for cyclists are characterised by:

- Wide road reserve and slower traffic speeds, mean that cyclists can safety share the road space with vehicles and on-street parking, without special engineering treatments.
- Ogilvie Street is not suitable for cycling on footpaths, as street furniture on pathways may obstruct movement, thereby creating spatial constraints or increasing conflict potential with pedestrians.

Opportunities and Constraints

In future, **opportunities** to create enhanced conditions for walking and cycling in Denman should consider:

■ Integration with the open space system and Sandy Creek corridor:





Pleasant pedestrian environment

Shaded walkways and street furniture



Ogilvie Street's generous width suitable for shared use by vehicles and bicycles





Opportunity to extend Sandy Creek path

Sandy Creek corridor through Hyde Park

Continuation of the Sandy Creek Path south to Hyde Park utilising public open space, offers a logical extension of Denman's main pathway system. It may also provide new access opportunities to the southern end of town, together with enhanced scenic and recreational values for residents and visitors.

A secondary opportunity exists to formalise an existing pedestrian desire line through Arbor Park adjacent to Virginia Street. This may provide improved access to facilities at Denman Recreation Area, and an enhanced parkland setting close to the main street and retirement village.

■ Alternative options in "low use" situations:

Where paths are not provided in low use situations around the town, wide grass verges or road shoulders may provide adequate access for pedestrians and cyclists, and some separation from motorised vehicles.

■ Improving Denman's network legibility and safety with signage:

Signage is cost effective and can be deployed quickly to improve conditions in the short-medium term.

Major constraints for walking and cycling in Denman will be:

Golden Highway (Palace / Crinoline Streets):

Sections of the Golden Highway are hazardous for cyclists and pedestrians where it passes through Denman. Related issues are:

- Increased traffic volumes, including haulage route for quarry and other industrial traffic.
- Lack of available space for pathway construction along some sections, due to presence of utility poles, drainage channels and reduced verge width.
- Debris and cracking on road shoulders for cyclists.
- Safe crossing points, particularly in school zones e.g. Crinoline/ Palace Street intersection.



Existing pedestrian desire line through Arbor Park



Wide grass verges



Pathway constraints on Palace St

■ Rail Crossing:

Rail corridors typically represent a barrier to bicycle and pedestrian movement. There are two formal crossings of the Muswellbrook-Merriwa Railway at Ogilvie and Kenilworth Streets.

A priority will be to strengthen the east-west pathway link over the rail crossing between Ogilvie Street and Denman Recreation Area. This will also benefit the growing residential area on the western side of town.

Although an existing pedestrian crossing facility is provided, the rail corridor is a significant safety consideration, and there is a need to ensure movement paths are of high standard, and effectively channel path users to designated crossing points.



Pedestrian crossing of rail line at Ogilvie St





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FIGURE 6 - Existing Paths and Community Focal Points [Denman]

3.2. STATE CONTROLLED ROADS

There are three State Controlled Roads (SCR) in Muswellbrook Shire:

- New England Highway which passes through Muswellbrook. Entering into the Muswellbrook CBD from the south, it is called Maitland Street, turns right at Sydney Street, left onto Bridge Street and then is renamed New England Highway on departure of the township. The whole road is State controlled.
- Golden Highway which runs through Denman. Entering the township from the west, it follows Crinoline Street, turns right onto Palace Street and on departure of the township is again called Golden Highway. The whole length is State controlled.
- There is a road which runs from the New England Highway at Muswellbrook to the Golden Highway east of Denman. This is State controlled. The RTA refer to it as "MR209", however it is shown on maps as "Highway 84".

3.3. TRIP GENERATORS AND ATTRACTORS

The identification of land uses and natural landscape features which attract and generate walking and cycling activity is necessary so the proposed network reflects trip patterns and community needs. These will provide the "anchor points" of the walk and cycle network.

Major trip generators and attractors will include:

- Residential areas existing and future.
- Education facilities primary, secondary, tertiary.
- Employment nodes.
- Shopping / commercial precincts.
- Major parks, sport and recreation facilities.
- Other community focal points e.g. hospital.

Major trip attractors for Muswellbrook and Denman are summarised the tables below.

Table 3.1 – Trip Attractors in Muswellbrook (See Figures 4 and 5)

Major Parks, Sport and Recreation Facilities				
S1	Karoola Park			
S2	Victoria Park			
S3	Olympic Park			
S4	 Bowman Park 			
S5	 Wollombi Park 			
S6	 Brennan Park 			
S7	 Highbrook Park 			
S8	 Simpsons Park 			

S9	Weeraman Sporting Fields
S10	Indoor Sports Centre
S11	Tennis Courts
S12	PCYC
S13	Swimming Pool
S15	Karoola Playground
Educatio	on Facilities
E1	 Muswellbrook Public School, Roger St
E2	 Muswellbrook High School, King St
E3	 Muswellbrook South Public School, Maitland Street
E4	 St James Primary School, Skellatar Stock Route
E5	 Hunter Institute of TAFE, Muswellbrook Campus, Maitland St
E6	 Dunmore Lang Christian Community School, Sowerby St
Busines	s / Commercial Nodes
B1	 Muswellbrook CBD, Bridge St
B2	Muswellbrook Fair Shopping Centre, Rutherford Rd, South Muswellbrook
Other Ma	ajor Community Focal Points
C1	Art Gallery
C2	 Muswellbrook Hospital
C3	 McDonalds Restaurant

Advice from Council officers confirmed that very few people commute via bicycle to mine sites in the Muswellbrook district. Therefore, mines were not identified as a trip attractor in this analysis.

Council is also considering the development of skate park in Muswellbrook. At the time of writing the location was to be determined – this will be an important community focal point particularly for youth and should be serviced by the walk and cycle network.

Forward planning should also include provision for connections to residential expansion areas in both Muswellbrook and Denman.

Sporting Facilities					
S1	 Denman Recreation Area - Central Precinct (swimming pool, indoor sports centre, child care centre, tennis courts, golf clubhouse) 				
S2	 Denman Recreation Area - Outer Precinct (rugby league, scouts, pony club, cricket, hockey) 				
S3	Lawn Bowls Club				
Major Pa	ırks				
R1	Arbor Park				
R2	Hyde Park				
R3	Memorial Park				
Educatio	on Facilities				
E1	 Denman Public School, Paxton St 				
E2	 St Josephs Primary School, Palace St 				
Busines	s / Commercial Nodes				
B1	 Ogilvie Street (commercial precinct) 				
Other Ma	ajor Community Focal Points				
C1	Denman Hospital				
C2	Retirement Village				
C3	RSL				
C4	 Caravan Park 				

Table 3.2 – Trip Attractors in Denman (See Figure 6)

Advice from Council officers confirmed that very few people would travel to wineries in the Denman district via bicycle or on foot. Therefore, wineries were not identified as a trip attractor in this analysis.

3.4. CRASH STATISTICS

A review of RTA's pedestrian and bicycle crash data for Muswellbrook and Denman was undertaken for the period January 2003 to October 2008. To be included on the official database, crashes must be reported to police.

As a high proportion of pedestrian and bicycle accidents *go unreported*, the incidence of other (minor) accidents may be more frequent than these figures suggest.

3.4.1. TOTAL CRASHES

33 traffic accidents were recorded in Muswellbrook from January 2003 to October 2008. Nonmotorised modes appear to be over-represented in this profile, with 17 pedestrian and cycle accidents (51%), compared with only 9 car accidents (27%).

CATEGORY	NUMBER	PROPORTION OF TOTAL
Car Accident	9	27%
Light Truck Accident	5	15%
Rigid Truck Accident	0	-
Articulated Truck Accident	0	-
Heavy Truck Accident (1)	0	-
Bus Accident	1	3%
Heavy Vehicle Accident (2)	1	3%
Emergency Vehicle Accident	0	-
Motorcycle accident	0	-
Pedal Cycle Accident	6	18%
Pedestrian Accident	11	33%

Table 3.3 - Total Crashes by Type in Muswellbrook (Jan 2003 - Oct 2008*)

Source: RTA Hunter Region (Oct 2008). Note: categories are not mutually exclusive

* All 2008 data is provisional and subject to change.

(1) Rigid or articulated truck; (2) Heavy truck or bus.

3.4.2. PEDESTRIAN AND BICYCLE CRASHES

Table 3.4 summarises the number and severity of pedestrian and cyclist crashes recorded in Muswellbrook since 2003³. <u>No</u> pedestrian/ cyclist crashes were recorded in Denman – thus the proceeding analysis applies to Muswellbrook only.

³ Pedestrian and cyclist accidents are not differentiated in this data.

YEAR	Injury		Fatal		TOTAL	
	No.	%	No.	%	No.	%
2003	5	29%	0	0	5	29%
2004	4	24%	1	6%	5	29%
2005	1	6%	0	0	1	6%
2006	2	12%	0	0	2	12%
2007	3	18%	0	0	3	18%
2008*	1	6%	0	0	1	6%
Total	16	94%	1	6%	17	100%

Table 3.4 – Pedestrian and Cyclist Crashes in Muswellbrook (Jan 2003 – Oct 2008)

Source: RTA Hunter Region (Oct 2008).

* All 2008 data is provisional and subject to change.

For the period assessed, notable accident factors for Muswellbrook were:

- 17 crashes were reported, including 16 injuries and 1 fatality (February 2004).
- The number of crashes peaked in 2003 and 2004. A decline is evident in recent years.
- The most common type of accident was pedestrians being hit by a vehicle (59%).
- Accidents involving male pedestrians or cyclists were significant (83%).
- Adults aged 25 to 54 are over-represented in the crash profile this group represents 61.5% of casualties, and only 40.4% of Muswellbrook's total population.
- Only 1 casualty involved a child aged under 15 years old typically regarded as a "high risk" group in crash statistics (see Chart 3.1).



Chart 3.1 – Proportion of Pedestrian / Cyclist Crashes by Age Group

- 42% of crashes occurred between 3pm and 6pm, coinciding with afternoon school and work commuting times.
- A majority of crashes occurred on a Wednesday (41%) or a Friday (24%). Only 1 crash (6%) occurred on a weekend.
- In terms of location type:
 - Only 6 crashes (35%) occurred at an intersection.
 - A majority of recorded cases involved a pedestrian crossing the road (59%).
- In respect to crash conditions:
 - Most crashes occurred in daylight (71%), with the balance occurring at dusk or in darkness (29%).
 - 15 crashes occurred in fine weather (88%). Only 2 occurred in rain or overcast conditions (12%).

Figure 7 illustrates the location of reported crash sites in Muswellbrook. This highlights crash clusters, specific problem areas or "blackspots" for cyclists and pedestrians:

- The highest incidence of crashes was recorded on the main street, Bridge Street⁴ (9), particularly between Market and Hill Streets.
- Smaller clusters exist around:
 - Lorne Street / Skellatar Street; and
 - Brook Street / Carl Street.
- No major accident clusters are identifiable around school campuses.

⁴ New England Highway



Figure 7 – Pedestrian and Cyclist Crash Sites (2003 – 2008*)

Source: RTA Hunter Region (October 2008).

* Note: Finalised data shown is from 1 Jan 2003. Data for March Quarter 2008 onwards is provisional only. Provisional data is incomplete and subject to change.

4. **DEMOGRAPHIC AND TRAVEL TRENDS**

4.1. **POPULATION SNAPSHOT**

4.1.1. CURRENT POPULATION

Muswellbrook Shire had an estimated resident population of 15,236 persons, as at 30 June 2006.

The population experienced moderate growth between 2001 and 2006, increasing by 440 people. This equates to a growth rate of 0.59% p.a., compared with a State average of 0.74% p.a.

Muswellbrook is the Shire's main urban centre with a population of approximately 10,000, representing 67% of Shire residents. Denman is a smaller centre with 1,385 residents – it experienced a decline of 22 persons since 2001.

Table 4.1 – Total Population for Muswellbrook Shire (2001-2006)

LOCALITY	TOTAL POP'N 2001	TOTAL POP'N 2006	Pop'n Change*	Annual Average Growth
Muswellbrook Shire	14,796	15,236	+440	0.59%
Muswellbrook UCL	10,010	10,222	+212	0.42%
Denman UCL	1,407	1,385	-22	-0.31%

Source: ABS Census (2001, 2006).

Note: UCL refers to "Urban Centre / Locality".

* Applies to number of persons.

Boundary of Urban Centre / Locality for Muswellbrook & Denman (ABS)





4.1.2. AGE STRUCTURE

In 2006, the Shire had a median age of 34 years old, compared with 33 for Muswellbrook (UCL), and 37 for both Denman and NSW. Key characteristics of the study area are:

- Muswellbrook (UCL) has a younger age profile with a high representation of children and young adults, reflecting local workforce trends.
- In contrast, Denman has a higher proportion of older adults and retirees. It also demonstrates a slightly higher representation of infants and school aged children when compared to the NSW average.
- Persons aged 25-54 years old represent about 40% of the total population in Muswellbrook and Denman, which is slightly lower than the state average.

Chart 4.1 – Age Profile Comparison (2006)



The age structure provides valuable insight into the likely "end users" of the walk and cycle network. In particular, this suggests the presence of several major groups in the study area, as follows:

- School children;
- Young and middle aged adults;
- Older adults and retirees; and
- A mix of other users, including wheeled devices and persons with special mobility needs.
Table 4.2 – Potential User Groups of the Walk and Cycle Network

Local Trends	Typical Characteristics and Needs	Examples (Indicative Only)
School Children Presence of school aged pedestrians and cyclists in Muswellbrook and to a lesser extent, Denman.	 Preference for off-road pathways separated from vehicular traffic and safe road crossings. Typically an unsupervised and vulnerable group with limited experience. An emphasis on safe routes to school, major recreational destinations and local streets with low traffic volumes. 	
Adults Presence of young and middle aged adult pedestrians and cyclists, particularly in Muswellbrook. They have widely varied needs and characteristics.	 Pedestrians, joggers and cyclists utilising pathways and trails for leisure and fitness purposes. Commuter cyclists travelling to work or college, with a preference for on-road bikeways with good surfaces, widths and alignment to facilitate fast and efficient trips. Parents with infants and strollers with a preference for off-road paths. 	
Older Adults and the Elderly Presence of older adults and the elderly, particularly in Denman. Likely to be seeking low-key opportunities for physical activity which are close to home e.g. walking paths.	 Walking and cycling for pleasure and fitness over relatively short distances. Preference for off-road facilities and circuits/ loops with a high degree of amenity. Preference for rest stops at regular intervals and other support facilities deployed along major routes. 	
Other Wheeled Devices Local pathways will be used by a range of other users, including wheeled devices and persons with special mobility needs.	 Providing path opportunities at acceptable grades and widths, good surface quality, and safe crossing points for persons with special mobility needs. Sufficiently wide paths for safe shared use by different user groups, including wheelchairs, strollers and wheeled recreation devices e.g. roller blades, scooters. 	

4.1.3. FUTURE POPULATION PROJECTIONS

Projections prepared by the NSW Department of Planning suggest the Shire's population will experience *negative growth* in future.

State Government projections suggest the Shire will drop below 15,000 persons by 2026 at a rate of -0.09% p.a., in comparison to NSW's average growth at 0.79% p.a (2006-2026)⁵. This equates to almost 200 less people in the Shire over the next 18 years.

Table 4.3 – Population Projections for Muswellbrook Shire⁴

_ 1	2006	2011	2016	2016 2021	
Muswellbrook Shire	15,150	15,080	15,040	15,010	14,960

Council anticipates that growth will be *positive and exceed these estimates*. Council and its consultants have analysed ABS data and State Government projections to develop revised population forecasts, as part of the Shire's recent *Integrated Water Cycle Management Concept Study*.

At the time of writing, the projections were not available for analysis, however, it is understood that Council forecasts positive growth for the Shire, with new residents primarily settling in the Muswellbrook urban area. More subdued change will expected in Denman and smaller communities, with population decline likely in some cases.

As noted in previous research⁶, significant drivers for population growth in the Shire will include:

- Approved development applications for large scale mining projects.
- Approved development application for the Mecure Hotel and conference centre in Muswellbrook.
- Potential construction of a third coal generated power station.
- Possible relocation of large electricity users into the "industry zone" at Macquarie generation power site south of Muswellbrook.
- Lack of rental accommodation in the Shire.
- Population migration from metropolitan areas (primarily Sydney), prompted by residential land costs and those in search of a lifestyle change i.e. "tree change".

⁵ NSW Department of Planning (2005), <u>New South Wales Statistical Local Area Population Projections 2001-2031</u>. (Note: Projections are based on 2001 ABS Census Data. Revised projections not available until 2009).

⁶ Muswellbrook Shire Council (Feb 2008), Ms D. Di Rollo – Economic Development Manager.

4.2. TRAVEL DATA

4.2.1. JOURNEY TO WORK

A review of 2006 Census data provides a snapshot of "journey to work" (JTW) data at the local level. The limitations of this data should be noted, as it does not represent many of the more common trips made by pedestrians and cyclists e.g. students, recreationalists, tourists.

Tables 4.4 and 4.5 provide a JTW comparison for Muswellbrook Shire, urban centres, and adjoining Local Government Areas (LGA's).

Locality Modal Share (%)	Muswellbrook Shire	UPPER HUNTER Shire	SINGLETON SHIRE	MID-WESTERN Regional LGA	Lітнсом Сіт у	MSN
Walk	7.0	9.4	4.8	9.2	6.4	5.5
Bicycle	0.4	0.6	0.5	0.9	0.9	0.8
Public Transport	0.5	0.7	0.4	0.6	0.8	11.5
Car (as passenger or driver)	87.8	83.7	89.8	83.2	88.1	78.4
Truck	2.0	3.5	2.2	4.0	2.2	2.0
Motorbike / Scooter	1.5	1.0	1.0	1.1	0.6	0.7
Other	0.8	1.2	1.2	1.0	1.0	1.0

Table 4.4 – Journey to Work Comparison for Selected LGA's (Single Mode Trips, ABS 2006)

Table 4.5 – Journey to Work Comparison for Muswellbrook and Denman (Single Mode Trips, ABS 2006)

Locality Modal Share (%)	Muswellbrook UCL	DENMAN UCL	Muswellbrook Shire
Walk	6.2	12.3	7.0
Bicycle	0.3	0	0.4
Public Transport	0.7	0	0.5
Car (as passenger or driver)	89.4	83.8	87.8
Truck	1.7	3.1	2.0
Motorbike / Scooter	1.1	0	1.5
Other	0.6	0.8	0.8



Chart 4.2 – Walking and Cycling to Work by Locality (Single Mode Trips, ABS 2006)

Key findings to emerge from the JTW modal split for 2006 are:

- Very high car dependency in Muswellbrook Shire and the surrounding region.
- High rates of walking to work in Denman (12.3%) and to a lesser extent in Muswellbrook (6.2%), in comparison to the State average of 5.5%.
- Low rates of cycling to work in Muswellbrook Shire and Muswellbrook UCL (<0.5%), with no cycle commuters registered in Denman.
- Low rates of public transport use.

Chart 4.3 shows the change in modal share between 2001 and 2006 for walking and cycling.



Chart 4.3 – Modal Share Comparison (2001 and 2006, ABS)

Notable findings for this inter-censal period are:

- For Denman, cycling to work appears to have ceased, although there was substantial growth in walking which represented 12.3% of the modal share (+4.1%).
- For Muswellbrook, cycling to work was generally stable (-0.1% change), coinciding with a small rise in walking (+0.7%).

4.2.2. JOURNEY TO SCHOOL

Building on the JTW data above, a survey of local schools was conducted as part of this study to determine the modal share for "journey to school" (JTS).

The JTS survey results demonstrated that only 33% of students ride or walk to school on a daily basis. Walking represents 28% of the modal share, compared with only 5% for cycling. Interestingly, these JTS rates are higher than JTW results for Muswellbrook and Denman.

Full survey results are presented in Section 5.



Chart 4.4 – Modal Share for Journey to School (Muswellbrook and Denman)

4.2.3. RECREATIONAL WALKING AND CYCLING

Although not captured by official travel statistics, both Muswellbrook and Denman have residents who enjoy walking and cycling for *fun and fitness*.

A key trend to emerge is the growing awareness of health benefits related to physical activity. In response, local and state governments are recognising the importance of planning and providing for active lifestyles and better community health. Walking is the most popular recreational activity for men and women in Australia, which is generating a growing demand for walking and cycling paths. People are seeking pathways that are safe, aesthetically pleasing, easily accessible, and well connected to community focal points such as schools, shops, parks and sporting facilities.

In contrast, for cyclists riding for fitness, a bikeway which affords a good quality surface and alignment will make up for traffic or lack of scenery. Less experienced cyclists riding for fun will value such things as scenery, safety and opportunities for circuit loops/ trails.

4.2.4. SPORTS CYCLING AND TOURING

A competitive cyclist community is active in Muswellbrook and Denman. It is understood that the local cycling club runs regular training rides and some competitions.

In addition to the club, individual cyclists conduct long distance training rides in Muswellbrook Shire and surrounding areas. There is also growing demand for bicycle touring in the Upper Hunter Region.

Examples of Walking and Cycling Activity in Muswellbrook



Pedestrians walking on the road - Wollombi Road



Fitness walker using grass verge on Sydney Street where the path runs out





Sports cyclists on Maitland Street

5. STAKEHOLDER CONSULTATION

A targeted consultation approach was conducted for this study, involving three principal stakeholder groups:

- Muswellbrook Shire Council:
 - Project briefing session with the newly elected Council (November 2008).
 - Discussions with Council officers (ongoing throughout the study).
- Roads and Traffic Authority Hunter Region; and
- Local schools in Muswellbrook and Denman.

Council determined that consultation with the general community was beyond the scope of this study, and may be conducted at a later stage.

Although the consultation was quite focussed, it provided insight into the major issues and opportunities across the study area. Notable findings are summarised below.

5.1. **MUSWELLBROOK SHIRE COUNCIL**

Major issues and needs raised by Muswellbrook Shire Council were:

1. Project Briefing Session with Councillors

- Muswellbrook:
 - Pathway circuits in parks are desirable, particularly for families with young children.
 - There is growing demand for longer distance bicycle touring between communities.
 - Pathway design should consider users with special mobility needs.
 - Growing recognition of the need for formalised on-road bikeways catering for experienced cyclists e.g. travelling to work or TAFE.
 - Address the "dead end" path along Muscle Creek in the vicinity of the Bridge Street rail bridge.
 - Major pathways should be well lit (including solar options) to afford safety and security to users.
- Denman:
 - Extend the Sandy Creek Path to Hyde Park.
 - Create new walking and cycling links into the Denman Recreation Area in accordance with the site's Master Plan.
 - Existing on-road bikeways near schools are not suitable for young children who are required to cycle with traffic and around parked cars e.g. Virginia Street.
 - Upgrade off-road paths in the Virginia/ Paxton Street area to improve school access and safety.

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Path link to Rosemount Road is needed.

2. Discussions with Council Officers

- Network Planning and Design:
 - The existing off-road pathway network provides good coverage in Muswellbrook and Denman.
 - Priority for future planning is to focus on network completion e.g. missing links.
 - Desirable for major shared paths to be 2.0m wide.
 - Where schools located are on highways, investigate off-road options for rear property access.
 - Additional funding would be beneficial to assist with future network development and maintenance.
- Muswellbrook Issues and Needs:
 - Some major corridors with wide road reserves offer good scope for improved onroad bikeways e.g. Sydney, Queen, Maitland, Aberdeen Streets.
 - Several "squeeze points" for cyclists exist on the highway e.g. rail underpass.
 - New signals are programmed for several intersections on highway through Muswellbrook.
 - Key trip destinations include the CBD, TAFE, schools and McDonalds restaurant.
 - Commuter cyclists unlikely to ride to industrial estates or mines located outside the Muswellbrook urban area. Also, potential for conflict with trucks on haulage routes.
 - Significant topographic constraints in northern part of Muswellbrook curb walking and cycling activity.
 - Extend network development to new residential subdivision areas in southern Muswellbrook.
- Denman Issues and Needs:
 - Tourism industry is strengthening in this area encourage visitors to utilise the local walking and cycling network.
 - The Bicentennial Trail passes through Sandy Hollow⁷ integrate bicycle touring opportunities.

⁷ Note: Sandy Hollow is located outside the study area.

5.2. ROADS AND TRAFFIC AUTHORITY (RTA)

Major points raised by the RTA were8:

1. Works programmed by RTA for pathway and bikeway projects in Muswellbrook Shire:

- The RTA carried out a bikeway/ pathway project with Council during the 2007/08 financial year. This involved construction of a 600m off-road shared path connecting from the work done by the developer of Eastbrook Links Estate to Rutherford Road.
- During the 2008/09 financial year, the RTA has a project to install pedestrian refuges on New England Highway (i.e. Maitland Street) in the vicinity of Lorne Street.
- The RTA is yet to finalise its 2009/10 program. However, it does not have any transport infrastructure works planned for Muswellbrook Shire in the near future.

2. RTA advice on funding of new and upgraded off-road pathways located in State Controlled Road (SCR) corridors:

- Funding is generally on a case by case basis, and is determined by the reason for the project and the location of the project. There are recent examples of joint funding with MSC, although the RTA also has cases where projects have been fully funded by them, or Council funded or even developer funded.
- Often local Councils submit requests for RTA contribution the RTA assesses these on where they lie in relation to its available funding and list of priorities.

3. RTA's position in respect to on-road bikeways on SCR's (generally):

The RTA supports the installation of these facilities subject to the requirements of Austroads Part 14 and the NSW Bicycle Guidelines being met.

4. RTA's position in respect to on-road bikeways on SCR's in Muswellbrook (Bridge, Maitland and Sydney Streets):

- It appears there would be benefits in providing on-road cycle lanes along these corridors.
- However, there are numerous conflicts that would need to be further investigated, such as side streets, development accesses, on-street parking and squeeze points

⁸ RTA Hunter Region (Nov 2008): Pers. comm. (Ken Saxby – Manager, Road Safety & Traffic Services; Adam Thomas - Planning & Analysis Manager)

5.3. SCHOOLS

There are seven schools located in the study area. Each school principal was invited to complete a survey on behalf of their students for input to the Walk & Cycle Plan.

The survey sought to determine:

- The proportion of students who walk or cycle to school;
- Principal desire lines for walking and cycling to school;
- Problem areas or "blackspots" for young pedestrians and cyclists in school zones;
- The reasons why students do not walk or cycle to school; and
- Priority routes for new or upgraded bicycle and pedestrian facilities in school zones.

As shown in the table overleaf, the response was supportive with 5 schools participating in the survey (71% response rate).

Table 5.1 – Response to School Survey

SCHOOL NAME	Student Enrolment (2008)	Response Received
Denman		
Denman Public School #	-	×
St Joseph's Primary School	38	~
Muswellbrook		
 Dunmore Lang Christian Community School * 	-	×
Muswellbrook Public School	580	~
Muswellbrook South Public School	395	~
St James Primary School	300	~
Muswellbrook High School	730	\checkmark

Declined to participate in survey.

* Could not be contacted via telephone, email or post.

Notable findings of the survey are summarised below.

1. Modal Share

- 33% of students ride or walk to school on a daily basis. Walking represents 28% of the modal share, compared with only 5% for cycling based on current school enrolments, this equates to almost 700 students travelling to school on foot or by bike.
- 60% of respondents indicated that the proportion of school pedestrians and cyclists had remained stable since 2003. 40% recorded a decline. Importantly, no schools reported an increase in walking or riding to school in the last 5 years.

School	WALK	CYCLE	Car	PUBLIC TRANSPORT
St Joseph's Primary School	14%	14%	43%	29%
Muswellbrook Public School	30%	2%	20%	48%
Muswellbrook South Public School	47%	3%	10%	40%
St James Primary School	0.5%	0.5%	25%	74%
Muswellbrook High School	47%	3%	20%	30%
Total	28%	5%	24%	44%

Table 5.2 – Journey to School by Mode of Travel

2. Travel Patterns by School

- As shown in Table 5.2, levels of walking and cycling to school vary considerably.
- *Highest rates* were recorded at:
 - Walking Muswellbrook South and Muswellbrook High (both 47%)
 - Cycling St Josephs in Denman (14%), Muswellbrook South and Muswellbrook High (both 3%).
- Lowest rates were recorded at St James Primary School for both walking and cycling.
- Public transport patronage appears to be higher in Muswellbrook.

3. Reasons for Not Walking or Cycling

- The principal reasons why students do not walk or cycle to school are:
 - Too dangerous.
 - Distance is too great.
 - Other forms of transportation more convenient.



Chart 5.1 - Barriers to Walking and Cycling for School Students (Proportion of Total Responses)

4. Problem Areas and Future Needs Identified by Schools

Each school was asked to identify problem areas and priorities for improving pathways and bikeways near their campus. Their suggestions are listed in the table below.

SCHOOL	SUGGESTIONS / ISSUES / NEEDS
St Joseph's Primary	 The paths on Palace St are dangerous with lumps of broken cement.
School, Denman	 Many local paths in Denman are in very bad disrepair.
Muswellbrook Public	 Problem areas for pedestrians and cyclists – Cook St, including Roger St intersection.
School	 Upgraded pathways will be a wonderful resource for the community, not only children but also for ageing people allowing safe exercise separated from increasing traffic flow.
Muswellbrook South Public School	 Problem areas for pedestrians and cyclists – Osborn Ave, Skellatar St, Lorne St, Nowland St.
St James Primary School	 Skellatar Stock Route – narrow, busy, ill-planned, wrongly cambered and too dangerous for bike and pedestrian traffic (and sometimes vehicles). Taking pedestrian/ cycle traffic through Fitzgerald Ave would be much safer.
	 Maitland St/ Bell St intersection - priority for safety upgrade.
Muswellbrook High	 New England Highway – safer cycle/ pedestrian crossings of are required.
School	 Bell St/ King St intersection - priority for safety upgrade.
	 Upgrade Dolahenty St / Bell St route.

6. THE STRATEGY

6.1. OVERVIEW

This section presents the proposed **Walk & Cycle Network** for the communities of Muswellbrook and Denman. The overall aim of proposed network is to:

"Provide walking and cycling facilities in Muswellbrook and Denman to improve mobility, recreation and physical activity choices for all age groups."

The proposed network builds on existing pathway infrastructure to improve connectivity, coverage and safety. It also seeks to create linkages and circuits that encourage walking and cycling activity, whilst minimising the reliance on private vehicles.

The Walk & Cycle Network comprises four key components:

- Overview of design guidelines for on-road and off-road facilities.
- Description of proposed networks for Muswellbrook and Denman.
- Implementation Plan describing proposed works for each section of the network, including:
 - Route location and approximate distance.
 - Type of works proposed i.e. on-road and off-road treatments.
 - Priority/ timing of works.
 - Responsibility for project implementation (Council, State, developer).
- Other critical actions to support development of the walk and cycle network.

6.2. **DESIGN GUIDELINES**

6.2.1. AUSTROADS

Whilst the preparation of design guidelines was beyond the scope of this study, suggested facility treatments for the study area are largely based on *Austroads Guide to Traffic Engineering Practice (Part 13 – Pedestrians; and Part 14 – Bicycles).*

Austroads guidelines are widely accepted by local government in Australia, however, it should be noted that they are not intended as absolute standards. Therefore, Council is encouraged to implement the guidelines *as practicably as possible*, subject to local conditions which may require modifications or reduced facility widths e.g. spatial constraints, low demand routes, funding availability.

Austroads Part 149 recommends the following widths for off-road shared paths:

- Absolute minimum 2.0m
- Acceptable range 2.5m to 4.0m

For off-road paths primarily intended as a **footway**, Austroads Part 13 recommends an absolute minimum width of 0.9m and an acceptable range of 1.2m to 1.8m.

Austroads Part 14 recommends the following widths for on-road bikeway treatments:

Treatment Type	Desirable Width	Acceptable Width Range
Shared bicycle / parking lane	4.0m	3.7m – 4.5m
Wide kerbside lane	4.2m	3.7m – 4.5m
Exclusive bicycle lane	1.5m	1.2m – 3.0m

6.2.2. LOCAL APPLICATION

On this basis, the selection of "off-road" or "on-road" treatments for Muswellbrook and Denman aims to identify the most suitable facility in the most suitable location, guided by the following considerations:

- Function of the route;
- Potential end users;
- Safety;
- Existing conditions; and
- Cost efficiency.

For the purpose of this study, the following major facility types are proposed for implementation:

Facility Type	Ref	Example (Indicative Only)
Off-Roa	D TREATM	ENTS
New Path Off-road path provided as footways or wider facilities for the shared use of cyclists, pedestrians and other users e.g. wheelchairs, strollers, etc.	NP	
Pathway surface – sealed asphalt or concrete.		
[New Path example – standard 1.2m wide footway]		

⁹ Refer to Austroads for full details regarding acceptable widths.

Facility Type	Ref	Example (Indicative Only)
New Path (continued) [New Path example – 2.0m wide shared use]	NP	
Path Upgrade	UP	As above.
Replacement or widening of existing footpath.		
Pathway surface – sealed asphalt or concrete.		
Trail	Т	
Tracks and trails for recreation and fitness purposes. Suitable for shared use in natural or low-use settings.		
Surface treatment to reflect natural aesthetics e.g. decomposed granite, compacted earth.		
On-Roa	D TREATME	NTS
Exclusive Bicycle Lane Formally designated kerbside lane for dedicated use by cyclists, with full line marking, pavement logos and signage. Parking not permitted.	EBL	
Shared Bicycle and Parking Lane	SBPL	- tert
Shared kerbside lane, comprising formally designated bike lane and adjacent on-street parking space. Facility to be of adequate width to cater for parked vehicle, bicycle design envelope and open car door.		

Facility Type	Ref	Example (Indicative Only)
Bicycle Awareness Zone A BAZ is an area of road shared with motor traffic, designated with yellow bike stencils to increase motorists' awareness of the presence of bicycles on the road. The treatments are advisory only and have no associated signage and no legal effect. Suitable in locations where spatial constraints exist and full SBPL cannot be achieved, or in lower traffic situations.	BAZ	
Shared Zone	SZ	
Advisory treatment suitable in local streets only carrying low traffic volumes (<3,000 vpd).		
No special improvements provided apart from route signage, and possibly yellow pavement logos to indicate presence of cyclists and encourage considerate driving habits in this "shared zone". [Shared Zone example – pavement logos]		
[Charad Zana ayamala - rayta airmaga aybi]		
[Shared Zone example – route signage only]		

These treatments are intended as a *guide only* to convey the general nature of works required for Muswellbrook and Denman.

Therefore, it is timely for Council to review its current design standards for pathways and bikeways, and prepare more detailed design treatments for each section of the proposed network.

6.3. **RECOMMENDED NETWORKS**

This section provides a description of the proposed networks for each community. This provides the basis for the Network Implementation Plan in Section 6.4, which details specific works for each route.

6.3.1. MUSWELLBROOK

Muswellbrook already has a reasonable pathway network. This strategy will aim to build on existing facilities to significantly enhance pedestrian and cycle movement, through:

- Upgrading and extending off-road pathways.
- Targeted development of formal on-road bikeways along key corridors to facilitate continuous, convenient and safer travel for experienced commuter cyclists.
- Minimising barriers to pedestrian and cycle movement.
- Improving the legibility of pathways and trails located in parkland.
- Strategic integration of pathways and bikeways with future residential subdivision, rather than retrofitting facilities at a later stage for higher cost.
- Provision of **recreation and fitness trails** to support more healthy and active lifestyles.

In summary, major actions for Muswellbrook's Walk & Cycle Network are:

CBD Access and Cross-Town Routes

- Formalise the presence of experienced commuter and sports cyclists sharing the roads with motor vehicles. Establish on-road bike lanes and advisory treatments along three major corridors to create "cross-town" routes between the CBD and suburbs, via:
 - Maitland Street;
 - Sydney Street; and
 - Bridge Street.
- Support the primary corridors above with secondary links to facilitate on-road cycling in suburban catchments, via:
 - Southside Rutherford Road, Bimbadeen Drive and Skellatar Stock Route.
 - Northside Cook, Brook, Brecht and Queen Streets.
- Close the "dead end" path along Muscle Creek, where it terminates beneath the rail underpass for public safety and risk management reasons. The strategy recommends other measures to improve the legibility of existing paths at street level, to facilitate enhanced pedestrian and cycle access across the rail line and creek.
- As the standard of existing pathways in the CBD is generally good, target future improvements on path connectivity, linkages to adjoining residential areas and maintenance.

Monitor opportunities to establish new north-south cycle/ pedestrian links across Muscle Creek and the rail line, coinciding with future town expansion and new road projects.





Maitland St - New on-road bikeways and off-road paths proposed to facilitate full route continuity into the CBD





Sydney St – formalise on-road bikeways and parking arrangements along this popular cycle route



Good standard of service provided by CBD paths



Close dead end path next to Muscle Creek



Formalise cycle access through CBD via Bridge St



Redirect peds / cyclists via existing paths at street level (William St, Simpsons Park and Fitzgerald Park)

Southside

- Extend the existing path network in this area to improve coverage and connectivity, including new access points to Maitland and Sydney Streets.
- Implement off-road and on-road facilities for cyclists and pedestrians via Skellatar Stock Route, coinciding with the future road upgrade.
- Formalise access for pedestrians and cyclists through Wollombi Park to improve safety, particularly for school children. Also minimise unregulated use of the Wollombi Park as a "short cut" for cars.
- Upgrade pedestrian and cycle facilities to Muswellbrook Fair from the surrounding residential catchment via:
 - Rutherford Road;
 - Brennan Park;
 - Woollybutt Way / Kurrajong Reserve; and
 - Acacia Drive.
- Locate new pathways and bikeways to optimise their integration with signalised intersections planned by Council/ RTA along Maitland Street. This will create new crossing points at:
 - Lorne Street;
 - Thompson Street;
 - Rutherford Road; and
 - Bimbadeen Drive.
- Address the missing link between Olympic and Fitzgerald Parks construct a new section of path to provide route continuity between the two parks, whilst servicing an important sport and recreation precinct on-route.
- Negotiate with Muswellbrook Golf Club to investigate purchase or land swap, for a small portion of land along the southern boundary of the golf course fronting the highway, between Bell and Thompson Streets. The rationale for this proposal is:
 - This is a very popular desire line for unregulated pedestrian and cycle access through private land.
 - It would benefit from construction of a formal pathway coinciding with the planned installation of new signals at Thompson Street.
 - It would have the added benefit of improving safety for school and TAFE students travelling north via Bell Street.
- Identify and secure strategic corridors for new pathways and bikeways, timed with future residential development in town expansion areas (south-east Muswellbrook).



Skellatar Stock Route – new paths and bikeways proposed with future road upgrade





Rutherford Rd – address missing links in path network near Muswellbrook Fair



Formalise popular pedestrian desire lines through Brennan Park and Kamilaroi / Thompson Sts



Formalise pedestrian and vehicular movement through Wollombi Park



Nowland St – Strengthen local linkages and important pedestrian desire lines





Maitland St - Opportunity for additional pedestrian / bicycle crossing points with new signalised intersections

Northside

- Provide new off-road and on-road facilities via routes which bypass topographic barriers.
- Improve the level of service in the high school zone key works are:
 - New off road path via Dolahenty Street and safety measures at the Victoria Street pedestrian crossing (approaching hillcrest and Bell St rail bridge).
 - New on-road bikeway via Brook Street, between the school campus and CBD.
- Address missing links in the path network around Muswellbrook Public School at:
 - Roger Street;
 - Cook Street;
 - Dumaresq Street; and
 - Access points to Karoola Park.
- Formalise the existing pedestrian desire line along Carl Street between the PCYC and Cook Street. This will help improve safety along this busy route, given higher traffic speeds and the incidence of crashes involving cyclists and pedestrians.
- Remove or upgrade the existing pedestrian access point in the fenceline from Bridge Street to Aberdeen Street. Treatment of this informal trail down a steep bank requires resolution for risk management reasons.
- Deploy signage and conduct maintenance on paths and trails through Karoola Park and Verdelho Reserve. Also extend the Karoola Park trail to the netball courts and playground (Hunter Street end).
- Improve path coverage in the Wine Estate by upgrading park-based trails, supported by strategic development of new local paths via Lexia, Cabernet and Semillon Streets.
- As a long range objective, extend new off-road and on-road facilities north via Queen Street to service town expansion areas.

Recreational Paths and Trails

- Upgrade the existing paths and trails located in the town's parks and linear reserves, through:
 - Path/ trail maintenance including resurfacing and selective removal of vegetation for better visual surveillance e.g. The Common.
 - Deployment of highly visible and informative signage along major trails and at access points, including direction, distance and destination information. This will significantly improve network legibility and public awareness.
- Establish trail circuits in key parks, to formalise existing desire lines, and provide new recreation/ fitness opportunities for residents of all ages. Recommended sites are:
 - Brennan Park;
 - Victoria Park; and
 - Volunteer Park.

New paths and trails along the Hunter River have not been recommended in this strategy, largely due to stakeholder feedback, safety concerns, lack of demand and likely high capital costs. However, Council should monitor any new opportunities which may arise in future.



Carl St – pathway needed to formalise existing pedestrian desire line



Dolahenty St - Pathway required for high school access



Cook St - proposed on-road bikeway route to CBD



Queen St – pathway and bikeway facilities proposed to support residential growth area



The Common – upgrade existing trails



Newman St – upgrade local access points to Karoola Park pathway system

6.3.2. DENMAN

The objectives for the proposed Walk & Cycle Network in Denman are to:

- Complete the off-road pathway network in Denman's central area.
- Improve connectivity and safety for local trips.
- Create new pathway extensions and loops utilising public open space and the road network.

Major features of the proposed Walk & Cycle Network are:

Town Loop System

- Targeted pathway development over short distances to:
 - Address "missing links" in the existing network;
 - Create a continuous "loop" system around the town; and
 - Strengthen east-west link for pedestrians and cyclists across the rail line.

School Zones

- Targeted network extensions and upgrades of off-road paths in the vicinity of Denman Public School and St Joseph's School.
- Priority works include:
 - Removal of on-road bikeway along Virginia St, replacing it with an off-road shared path.
 - New off road shared paths Merton and Palace Streets.
 - Path upgrades Paxton St (Merton Crinoline St) and Palace St (between St Josephs School and Crinoline St).
 - New zebra crossing treatment at the Paxton / Ogilvie St intersection.

Recreational Paths and Trails

- Extension of the town's major recreational pathway system via Sandy Creek from Turtle Street to Hyde Park.
- New north-south path meandering through Arbor Park complimented by other landscape improvements, to:
 - Formalise an existing pedestrian desire line through the reserve.
 - Improve public access to the town centre, Denman Recreation Area, and hospital/ retirement village.
 - Create a new destination park for Denman residents and visitors.
- New trail circuit around Denman Recreation Area for walking and fitness.

Town Expansion Areas

- Strategic routes identified for pathways as a longer range objective, to improve connectivity between Denman and town expansion areas to the outer west and south.
- Subject to timing of future development, key links for longer term provision will be:
 - Rosemount Road;
 - Turner Street;
 - Bell Street;

- Almond Street; and
- Bray Street.

Given the town's low-key nature and traffic environment, special engineering solutions for *on*road bikeways are not considered necessary.



Proposed extension of Sandy Creek Pathway to Hyde Park and the playground



Excellent opportunity for new pathway connection via Arbor Park to create recreational loop



Path widening and replacement proposed for the school zone (Paxton St / Palace St)

6.4. NETWORK IMPLEMENTATION PLAN

Implementation details for the Walk & Cycle Network are presented in the proceeding tables and maps (see Appendices A and B). These provide the key operational components of the Plan.

It is anticipated that recommended works will occur in a number of stages, so they can be implemented in a logical and coordinated sequence over time:

- High Priority: Years 1 to 3.
- Medium Priority: Years 4 to 6.
- Low Priority: Years 7 to 9.
- Very Low Priority: Years 10+.
- Timed Priority: Coinciding with road upgrades or future residential development.

Principal determinants of network staging have been:

- Priority to missing links in the existing network near schools, the CBD and major desire lines.
- Priority to key corridors to establish a basic framework of complete and continuous routes between the CBD, Northside and Southside (Muswellbrook).
- Priority to blackspot locations.
- Priority to low cost improvements and renewal of existing facilities e.g. route signage.

It is evident that some network elements would be beyond the capacity and/ or responsibility of Council to fund, and implementation will be influenced by the availability of Council funds, external funding opportunities, or partnership opportunities with other agencies (e.g. RTA). Consequently, some works may be subject to rescheduling.

The type and location of facilities proposed within State Controlled Roads (e.g. widened road shoulders, bike lanes, crossing points), should be confirmed in liaison with the RTA.

Recommended works for Muswellbrook have been categorised according to location, as follows:

- Southside;
- Northside;
- New England Highway / Maitland Street; and
- New England Highway / Bridge Street.

6.4.1. NETWORK IMPLEMENTATION PLAN FOR MUSWELLBROOK

ROUTE	ROUTE NAME	Route	SECTION	A PPROX	FACILITY	IMPLEMENTATION COMMENTS	PRIORITY	RESPONSIBILITY
NUMBER		From	То	LENGTH (M)	Түре			
Southsid	le							
M1-A	Sydney St	Maitland St	Skellatar St	880	SBPL	Establish shared parking and bike lane on both sides of Sydney St, with	High	RTA
				(total / both sides)		rull line marking, pavement logos and signage. The generous road width provides excellent scope to formalise the on-road treatment.		
M1-B	Sydney St	Skellatar St	Wollombi St	1,000	SBPL	Continue the shared parking and bike treatment on the eastern side where sufficient space exists.	High	RTA
				1,000	EBL	Implement an alternative treatment, exclusive bicycle lane, on the western side due to spatial constraints and absence of on-street parking demands. Improve edge and road shoulder coinciding with future maintenance, to facilitate a smoother cycling surface.	High	RTA
M1-C	Sydney St	Wollombi St	Skellatar Stock Route	460 (total / both	EBL	Apply exclusive bike lane treatments on both sides where the shoulder width decreases, south of Wollombi St.	High	RTA
				sides)		Shoulder widening and resealing is required over this short distance to improve conditions for on-road cycling.		
M1-D	Sydney St	Tarakan Ave	Wollombi Rd	290	NP	Provide 1.2m wide path on southern side to address "gap" in existing pathway.	High	MSC / RTA
M1-E	Sydney St	Dalwood PI / Brook Park	Skellatar Stock Route	25	NP	Provide a 1.2m wide path on the southern side, for a short distance between Skellatar Stock Route and the existing path at Dalwood PI.	High	MSC / RTA
M2	Wollombi Park	Wollombi Rd	Skellatar Stock Route	250	Т	Formalise a pedestrian/ cycle access trail through Wollombi Park (eastern side) for local access to St James Primary School and cross- neighbourhood trips.	Medium	MSC
						Motorised vehicles use Wollombi Park as a "short cut", therefore improved safety is warranted to minimise conflict potential, particularly given the likelihood of children using this route. Bollarding of the park may also be appropriate to manage unregulated vehicle access.		
М3	Wollombi Rd	Sydney St	Patterson PI (easement path)	1,210	NP	Establish a 1.2m wide path on the southern side, providing a connection to the easement path in Patterson PI. The southern side is largely unconstrained for much of its length.	Medium	MSC
	Skellatar Stock Route	Sydney St	St James Primary School			Implement formal provisions for pedestrians and cyclists, coinciding with	Timed with	MSC /
M4-A				1,135	NP	Off read path (parthern side) connecting to the evicting 2 0m wide	upgrade	Developel
M4-B				2,320	SZ	path.		
				(total / both sides)		 On-road shared zone treatment with pavement logos and signage to service commuter cyclists on the southside. 		
M4-C	Skellatar Stock Route	St James Primary School	Rutherford Rd	1,700	SZ	Extend on-road shared zone treatment (both sides) to Rutherford Rd to	Timed with	MSC /
				(total / both sides)		provide commuter access.	upgrade	Developer

ROUTE	ROUTE NAME	ROUTE SECTION				IMPLEMENTATION COMMENTS	PRIORITY	RESPONSIBILITY
NUMBER		From	То	LENGTH (M)	IYPE			
M4-D	Skellatar Stock Route	Adams St	Rutherford Rd	335	NP	Continue off-road path on northern side (1.8m wide), between subdivision at Adams St to provide access to Rutherford Rd shopping area (Muswellbrook Fair).	Medium	MSC
M5-A	Ironbark Rd	Rutherford Rd	New subdivision	na	BAZ and NP	As a long range objective, extend on-road and off-road treatments south to service new subdivision area.	Timed with future res. development	Developer
M5-B	Ironbark Rd	Rutherford Rd	Plashett Cl	390	NP	Provide 1.5m wide path on northern side. Reduced width suitable in this low use situation to provide route continuity.	Medium	MSC
M6-A	Rutherford Rd	Ironbark Rd	Existing path	215	NP	Construct new section of 2.0m wide path on southern side for a short distance, to provide a continuation of the existing path from Muswellbrook Fair.	High	MSC / Developer
M6-B	Rutherford Rd	New England Highway	Ironbark Rd	1,400 (total / both	BAZ	Provide formal on-road cycle access on Rutherford Rd, given the high traffic volumes and manoeuvres generated by Muswellbrook Fair.	Medium	MSC
				sides)		Establish Bicycle Awareness Zones on both sides of Rutherford Rd. Adequate space exists to meet on-street parking demand and bicycle access.		
						Note: LATM device at northern end approaching highway may require modification to allow through access for cyclists.		
M7-A	Calgaroo Ave	Ironbark Rd	Beech St	495	NP	Construct path on the northern side to provide connectivity with other local paths, including Kurrajong Reserve. 1.2m wide facility is suitable in this low use situation and consistent with existing paths.	Medium	MSC
						Note: Residential tree planting encroaches onto footpath reserve and targeted removal may be required to facilitate path construction.		
М7-В	Calgaroo Ave	Beech St	New subdivision	na	NP	As a long range objective, extend footpath construction south to service new subdivision area.	Timed with future res. development	Developer
M8	Beech St	Calgaroo Ave	Acacia Dr	320	NP	Connect new off-road path on northern side to provide connectivity with Kurrajong Reserve. A 1.2m wide facility is consistent with existing paths in this low use situation.	Medium	MSC
M9-A	Bloodwood Rd	Acacia Dr	Coolibah Cl	160	NP	Extend existing path on southern side to Acacia Drive to provide route continuity and local access. A 1.2m wide path is consistent with the existing facility.	Medium	MSC
M9-B				75	UP	Maintenance to existing cracked pathway section is also required at hillcrest to provide safe access.		
M10-A	Acacia Dr (easement)	Acacia Dr	Gobruk Cl	175	NP	Formalise existing grassed trail via easement between Acacia Dr and Gobruk CI – provide sealed path (1.0m wide) between residential properties and signage to designate the access point.	Very Low	MSC
M10-B	Acacia Dr	Rutherford Rd	Bloodwood Rd	500	NP	Construct 1.8m wide path on northern side of Acacia Dr to Eurabbie St.	Low	MSC
				280		Continue path as a 1.5m wide facility on northern/ eastern side to Bloodwood Rd.	Medium	MSC

	ROUTE NAME	Route	SECTION			IMPLEMENTATION COMMENTS	Priority	Responsibility
NUMBER		From	То		1175			
						As a long range objective, extend footpath construction south to service new subdivision area.	Timed with future res. development	Developer
M11	Bimbadeen Dr	New England Highway	John Howe Cct	1,700 (total / both	SZ	Bimbadeen Dr will provide an increasingly important link for commuter access from the Eastbrook Links Estate to the New England Highway.	Medium	MSC
				sides)		signage on both sides of the road.		
						In the longer term, extend both on-road and off-road treatments to the south, coinciding with future residential development.	Timed with future res. development	Developer
M12-A	Woollybutt Way	Kurrajong Reserve	Casuarina Cl	155	NP	Construct a 2.0m wide path on the northern side of Woollybutt Way, to provide a continuation of the existing facility at the rear of Muswellbrook Fair. Other works will include:		
						 Erect distance and directional signage at the existing pathway junction with Kurrajong Reserve. 	Low	MSC
						 Erect advance warning signs for motorists where the Kurrajong path crosses Woollybutt Way. 	High	MSC
						 Provide warning signage and/ or coloured pavement treatment where the Kurrajong path crosses the car park at Muswellbrook Fair. The current arrangement is unsafe and requires action to minimise the conflict potential with delivery trucks and other vehicles. 	High	Centre Management
M12-B	Woollybutt Way	Casuarina Cl	Calgaroo Ave	120	NP	Provide short section of 1.5m wide path on western side to provide a continuous route along Woollybutt Way.	High	MSC
M13	Casuarina Cl	Woollybutt Way	Easement	90	NP	Provide short section of 1.2m wide path on southern side for route continuity with existing easement path.	Very Low	MSC
						As a long range objective, extend existing easement path east to provide rear property access to Muswellbrook Fair.	Timed with future development	Developer
M14	Cassidy Ave / Brennan Park	Rutherford Rd	Kamilaroi St	985	Т	Establish a walking trail circuit around Brennan Park, providing access points to Rutherford and Kamilaroi Streets. This will formalise a significant pedestrian desire line, and provide a new recreation/ fitness opportunity for local residents. Provide a suitable crossing treatment where the path crosses Rutherford Rd.	High	MSC
M15	Kamilaroi St	Brennan Park	Thompson St	130	NP	Construct a 1.8m wide path from Brennan Park to Thompson St on the eastern side to formalise the well-worn dirt track.	High	MSC
M16-A	Thompson St	Kamilaroi St	New England Highway	275	NP	Complete the final section of this local desire line, with a 1.8m wide path on the southern side of Thompson St, terminating at the existing pathway fronting the highway. Where spatial constraints exist outside McDonalds restaurant, provide a 1.2m path if possible (1.0m absolute minimum).	High	MSC
M16-B	Thompson St	Kamilaroi St	Adams St	370	NP	Construct a 1.5m wide path on southern side to service the growing residential catchment and local school. Some street trees may warrant removal to facilitate access.	Medium	MSC

ROUTE	ROUTE NAME	ROUTE SECTION				IMPLEMENTATION COMMENTS	PRIORITY	RESPONSIBILITY
NUMBER		From	То	LENGTH (M)	IYPE			
M16-C	Thompson St	Adams St	Fitzgerald Ave	240	NP	Construct a 1.5m wide path on southern side.	Medium	MSC
M17	Fitzgerald Ave	St James Primary School	Tindale St	135	NP	Construct a 1.5m wide path on western side from the head of the Fitzgerald St cul-de-sac, for rear property access to St James Primary School. Liaise with school to determine issues and needs.	Medium	MSC
M18	Nowland St	Tindale St	Skellatar St	160	NP	The existing easement path between Paterson PI and Nowland St is an important desire line for pedestrians and cyclists. As a logical extension to the existing path, provide a new 1.5m path western side of Nowland St.	Medium	MSC
M19	Tindale St	Fitzgerald Ave	Nowland St	295	NP	Construct a 1.5m wide path on southern side in front of the aged persons hostel to provide connectivity with the easement path (Nowland St).	Medium	MSC / School
M20	Skellatar St	Sydney St	Mitchell St	445	NP	Construct a 1.5m wide path on northern side of Skellatar St to service a popular desire line and school zone. Provide connectivity with existing paths in front of the community centre.	Low	MSC
M20-A	Ruth White Dr	Osborn Ave	Thompson St	590	NP	Construct a 1.5m wide path on eastern side to service school zone. Some street trees may warrant removal to facilitate access.	Medium	MSC
						Switch to western side approaching Thompson St to provide for a safe crossing distance / visibility at intersection.		
M20-B	Ruth White Dr	Easement	-	40	UP	Also formalise existing grassed trail via an easement adjacent to 29 Ruth White Dr – provide sealed path (1.2m wide) between residential properties and signage to designate the access point.	Low	MSC
M22	Adams St	Skellatar Stock Route	Ruth White Dr	740	NP	Continue the existing 1.5m path on the western side through to Ruth White Dr, including selective removal of some street trees to facilitate access.	Low	MSC
M23-A	Mitchell St	Skellatar St	Francis St	155	NP	Provide short section of connecting path, 1.5m wide on eastern side of Mitchell St.	Medium	MSC
M23-B	Mitchell St	Francis St	Sydney St	370	NP	Provide a 1.5m wide path along the edge of Bowman Park. Cross to the northern side of Mitchell St approaching Francis St for better route continuity.	Low	MSC
M24	Francis St	Mitchell St	Maitland St	200	NP	Provide a 1.5m wide path along Francis St to formalise an important access point to Maitland St. Although the northern side is preferred, a path on the southern side (adjacent to the army reserve base) may be less constrained.	Medium	MSC
M25	Anzac Pde	Sydney St	Easement path (Nowland St)	530	NP	Provide a 1.2m wide path on the northern side linking to the existing easement path (providing access to Nowland St). There is evidence of a well worn track in this location, suggesting it is an important desire line for cyclists and pedestrians.	Low	MSC
M26	Osborn Ave	Thompson St	Ruth White Dr	190	NP	Provide route continuity with existing path through new subdivision on Osborn Ave. Establish new 1.8m wide path on western side. Approaching Ruth White Dr, cross over to eastern side a safe distance from the intersection to channel path users to the existing zebra crossing.	High	MSC

ROUTE	ROUTE NAME	Routi	E SECTION	APPROX	FACILITY	IMPLEMENTATION COMMENTS	PRIORITY	RESPONSIBILITY
NUMBER		From	То	LENGTH (M)	Түре			
Northsia	le							
M27-A	Carl St	Cook St	Brook St	360	NP	Provide a 1.5m wide path on the western side for route continuity with Roger St and to service Muswellbrook Primary School. A squeeze point over the drain exists at the southern end nearing Brook St, where an engineering solution will be required.	Medium	MSC
						A safe crossing treatment is desirable at the Carl/ Brook St intersection.		
M27-B	Carl St	Brook St	Market Lane / PCYC	305	NP	Establish a 1.2m wide path on the western side to provide access to the PCYC. Sections of Carl St are busy, steep and spatially constrained. There is evidence of a well worn track suggesting it is a popular desire line.	High	MSC
M27-C	Carl St	Market Lane	Victoria St	80	NP	Extend the new path southwards along the western side of Carl St, to join an existing facility at Victoria St.	Medium	MSC
M28-A	Victoria St	Carl St	Lot 2 on DP 320245	170	UP	Replace the existing path on the northern side of Victoria St with a new 1.2m wide facility. The existing path is in very poor condition.	Medium	MSC
M28-B	Victoria St	Lot 2 on DP 320245	Dolahenty St	180	NP	Where the existing path runs out about 175m west of Dolahenty St, provide a new 1.2m wide facility on the northern side of Victoria St.	Medium	MSC
M28-B	Victoria St	Dolahenty St	Bell St	na	Signage	Deploy advance warning signage for motorists on the approach to the existing pedestrian crossing at Bell Street.	High	MSC
M28-B	Victoria St / Bell St intersection	-	-	na	UP	In the longer term, look at alternative engineering solutions to improve safety at this crossing point. This has been identified by local schools as a "blackspot" for young cyclists and pedestrians.	Low	MSC
M29	Dolahenty St	Victoria St	King St	375	NP	Provide a new 2.0m wide path on the eastern side on Dolahenty St (via William St) to service Muswellbrook High School. The new facility will connect to the existing King St path (northern end). At the southern end, the existing pathway section is elevated (top of batter cutting), and joins the Bell St overpass.	High	MSC
M30-A	King St	Clendinning St	Queen St	390	NP	Establish a new 1.5m path on the southern side for high school access.	Low	MSC
M30-B	King St	Brecht St	Roundabout (Brook St)	1,050 (total / both sides)	BAZ	Formalise on-road bicycle access to the high school. Establish Bicycle Awareness Zones on both sides of King St. This section has generous road reserve width for parking and cycle access.	High	MSC
						This section would benefit from resealing due to large potholes if funds permit.		
						Utilise the existing service road for cycle access on the northern side of King St near the roundabout.		
M30-C	Brook St	Roundabout (King St)	Bridge St	1,440 (total / both sides)	BAZ	Formalise on-road bicycle access to the CBD via Brook St. Establish Bicycle Awareness Zones on both sides. Terminate the BAZ treatment approximately 20m from the Bridge St signalised intersection.	High	MSC
						This section would benefit from resealing to provide a smoother ride. A squeeze point also exists for cyclists at the Sowerby St roundabout.		

ROUTE	ROUTE NAME	ROUTE SECTION		APPROX		IMPLEMENTATION COMMENTS	PRIORITY	RESPONSIBILITY
NUMBER		From	То	Length (m)	ΤΥΡΕ			
M30-D	Brook St	Bridge St	Hunter Tce	400 (total / both sides)	BAZ	Formalise on-road bicycle access to the CBD, to service the residential area on the western side of the rail line. Establish Bicycle Awareness Zones on both sides of Brook St for a short distance. A squeeze point for cyclists exists over the rail crossing.	Very Low	MSC
M31	Bell St	Victoria St	Maitland St	na	Signage	Deploy additional route signage along the existing Bell St path to clearly designate the route, including at the junction point with the Olympic Park path. Also provide advance warning signage for motorists where the path crosses from the southern to northern side, at the Maitland St end.	High	MSC
M32	Olympic Park	Wilkinson Ave	Bell St	na	Signage	Carry out selective clearing of overhanging vegetation along the existing path to provide improved sight distance and passive surveillance. Also provide direction and distance signage along the route.	Medium	MSC
M33	Fitzgerald Park	Wilkinson Ave	Olympic Park	280	NP	Service the sport and recreation precinct with an extension of the Fitzgerald Park path to Olympic Park.	Medium	MSC
						Extend the existing 2.0m wide path through Fitzgerald Park (parallel to the rail line), past the aquatic centre and tennis courts. Switch to the southern side of Wilkinson Ave near the croquet club, and join to the "dead end" path in the Olympic Park car park.		
						The path alignment to should follow the croquet club fenceline for a short distance to minimise conflict potential in the car park.		
M34	Haydon St	Maitland St	Bridge St	400	NP	Formalise local access via Haydon St into the CBD. Provide a 1.2m path on the northern side, including a connection to the Muscle Creek bridge.	New Path (Very Low)	MSC
						Remove redundant bike lane signs where they impede path access at the Bridge St end.	Signage removal (High)	
M35	The Common (Queen St)	King St	Verdelho Reserve	1,690 (total / both	UP	Upgrade existing recreational trails through The Common, running parallel to Queen St. Key works to improve trail safety and functionality are:	Medium	MSC
				sides		 Deploy distance and destination signage at regular intervals and access points to formalise the route. 		
						 Selective clearing of overhanging and screening vegetation along the trail to provide improved sight lines and passive surveillance. 		
						Trail surface improvements and ongoing maintenance.		
						Removal of redundant barriers along the path.		
	Queen St	Cook St	Future subdivision area			Queen St will provide an increasingly important link facilitating access to the Wine Estate precinct and future town expansion area to the north. Key works proposed for this section are:		
M36-A				4,000 (total / both sides)	SZ	 Establish an on-road shared zone treatment with pavement logos and signage on both sides of the road. 	Very Low	MSC / Developer
M36-B				1,660	NP	 Provide 1.5m wide pathway on the eastern side. 	Low	

ROUTE	ROUTE NAME	ROUTE SECTION		A PPROX		IMPLEMENTATION COMMENTS	PRIORITY	RESPONSIBILITY
NUMBER		From	То	LENGTH (M)	Түре			
M36-C						 Extend both on-road and off-road treatments to the north, coinciding with future residential development (Hunterview Estate and beyond). 	Timed with future res. development	
M37-A	Volunteer Park	Cabernet St	Sauterne Cl	240	NP	Establish a new 1.5m wide path along the southern boundary of Volunteer Park fronting Cabernet St – link to the existing path in the vicinity of Sauterne CI.	Medium	MSC
M37-B				455	Т	Also provide a loop around the perimeter of Volunteer Park for fitness and recreation purposes, terminating at Queen St. The loop could be treated as a trail with deco surface.		
M38	Verdelho Reserve	Shiraz St	Queen St	na	Signage / Maintenance	This pathway system provides a good level of service to the Wine Estate residential precinct.	Medium	MSC
						Provide more directional signage along the path and at access points to improve legibility. Targeted path maintenance also required e.g. cracking.		
M39-A	Karoola Park (West)	Hunter St	Semillon St	na	Signage	Provide directional and distance signage along the trail and at access points to improve legibility. Targeted trail maintenance also required e.g. overgrown grass.	Low	MSC
M39-B				360	NP	Extend the trail to the playground and netball courts, to provide east-west route continuity between Semillon and Hunter Streets.	Medium	MSC
M39-C	Karoola Park (East)	Semillon St	Queen St	na	Signage	Deploy directional and distance signage through the reserve and at access points to improve path legibility.	Low	MSC
M40-A	Hunter St	Karoola Park (west)	View Pl	235	NP	Extend a new 1.5m wide path from the Karoola Park playground and netball courts, via Hunter St (eastern side) to View PI.	Medium	MSC
M40-B	Hunter St	Sowerby St	View Pl	90	NP	Provide a 1.2m wide path on the southern side to formalise an existing pedestrian desire line and "short cut" through the cul-de-sac, linking to View Pl.	Low	MSC
M41	View Pl	Manning St	Hill St	na	Signage	Deploy directional/ route signage to guide cyclists and pedestrians to Bridge St, utilising existing laneways and steps (via Turanville Ave and St Heliers St).	Low	MSC
M42	Semillon St	Shiraz St	Cook St	180	NP	Provide 1.5m wide path on the western side to provide local access and connectivity with recreational trails in Karoola Park.	Medium	MSC
M43	Lexia St	Queen St	Verdelho Reserve	715	NP	Provide 1.5m wide path on the southern side to provide a local connection through the Wine Estate, and connect to the parkland trail system at Verdelho Reserve.	Low	MSC
M44-A	Cook St	Queen St	Sowerby St	920	NP	Provide a new path on the southern side of Cook St for connectivity with the existing school path (George St – Carl St), and to provide full off-road link to the CBD. A 1.5m wide facility is desirable along this section.	Medium	MSC
						Heliers St for access to Bridge St and the CBD.		

ROUTE	ROUTE NAME	ROUTE SECTION		APPROX		IMPLEMENTATION COMMENTS	Priority	Responsibility
NUMBER		From	То	Length (m)	ΤΥΡΕ			
M44-B	Cook St	Queen St	Sowerby St	2,400 (total / both sides)	BAZ	Formalise on-road bicycle access to the CBD via Cook St for Northside residents. Establish Bicycle Awareness Zones on both sides. Cook St has adequate road reserve width to accommodate the bikeway and on-street parking demand (including indented parking in some areas).	Medium	MSC
M45-A	St Heliers St	Sowerby St	Bridge St	420 (total / both sides)	BAZ	As a continuation of the Cook St route above, apply the BAZ treatment to both sides of St Heliers Street for CBD access. Road resurfacing would also be beneficial in this location, together with highly visible signage (mix of residential, commercial and light industry land uses). Provide signage and pavement logos to guide cyclists safely through the intersection, where it "dog legs" at Sowerby St (from Cook to St Heliers).	Medium	MSC
M45-B	St Heliers St	Existing path	Sowerby St	100	NP	Extend the existing 1.2m wide path for a short distance on the southern side up to Sowerby St.	Low	MSC
M46	Sowerby St	Hastings St (Karoola Park access)	Hill St	735	NP	Provide a 1.5m wide path on the eastern side to service the local residential catchment, between Karoola Park and the CBD.	Very Low	MSC
						Switch to the western side approaching Hill St, for connectivity with existing paths outside the Woolworths supermarket.		
M47-A	Roger St	Koombahla St	Cook St	65	NP	Provide a short section of path on the eastern side, to complete the existing path outside Muswellbrook Primary School (existing path is 1.3m wide). Also improve the crossing point onto Cook St where the paths connect.	High	MSC
M47-B	Roger St	Muswellbrook Primary School	Dumaresq St	180	NP	Extend the school pathway north to Newman St – a 1.8m wide path on the eastern side is required.	High	MSC
M48	Dumaresq St	Sowerby St	Roger St	215	NP	Provide a 1.5m path on the southern side to service the school catchment.	High	MSC
M49	Aberdeen St	Bridge St (pedestrian access point)	-	na	Upgrade or Remove	Remove or upgrade/ formalise the existing pedestrian access point in the fenceline from Bridge Street to Aberdeen St.	High	MSC
						Treatment of this informal trail down a steep bank requires resolution for risk management reasons.		
M50	Newman St	Karoola Park	-	105	UP	Upgrade the existing access point into Karoola Park for pedestrians and cyclists from the Newman St cul-de-sac.	Medium	MSC
M51	George St	Karoola Park	Cook St	155	NP	Provide a 1.5m path on the eastern side for a short distance, to formalise access to Karoola Park.	Low	MSC
M52	George St / Victoria Park	-	-	600	Т	Create a recreational and fitness walking trail around the perimeter of Victoria Park, with a deco surface treatment in-keeping with the natural surroundings. Extend trail along eastern boundary adjoining the cemetery.	Low	MSC
M53	Bowman St	Victoria Park	Queen St	585	NP	Provide a 1.5m path on the northern side to service the hospital, and to provide connectivity between Victoria Park and walking trails through The Common.	Low	MSC

ROUTE	ROUTE NAME	ROUTE SECTION				IMPLEMENTATION COMMENTS	Priority	RESPONSIBILITY				
NUMBER		From	То	LENGTH (M)	ITPE							
M54-A	Brecht St	Cook St	King St	670	NP	Provide new 1.5m wide path on the western side, passing the cemetery and hospital. This will formalise an existing pedestrian desire line.	Medium	MSC				
						Note: a squeeze point exists at the drain nearing King St at the southern end, which may restrict path construction.						
M54-B	Brecht St	Cook St	King St	1,460	SZ	Extend on-road shared zone treatment with pavement logos and signage,	Low	MSC				
				(total / both sides)		on both sloes of Brecht St to support the commuter cycling network on the Northside.						
M54-C	Brentwood St	Existing path	Brecht St	130	NP	Provide short section of pathway to address missing link in this location. Match width to existing facility.	Medium	MSC				
New England Highway / Maitland Street (Southern Side)												
M55	New England Hwy	Baybrook Motel	Rutherford Rd	335	NP	Construct new path for route continuity between Council Administration Centre and showgrounds (recently constructed paths are $1.8m - 2.0m$ wide). Some sections are spatially constrained along this route.	High	MSC / RTA				
M56-A	New England Hwy	Bimbadeen Dr	Rutherford Rd	740	EBL	Create an exclusive bike lane on southern side – this treatment is suitable due to narrow shoulder width and minimal on-street parking demand (primarily non-residential uses in this location).	High	RTA				
						Integrate bike lanes / line marking with new signals proposed for Bimbadeen Dr/ NE Hwy intersection.						
M56-B	New England Hwy	Rutherford Rd	Thompson St	615	BAZ	Apply BAZ treatment along this section with highly visible yellow pavement logos.	High	RTA				
						Although a SBPL would be more desirable, spatial constraints and on- street parking demand limit the options. Also, lane width reductions not feasible given high volume of industrial traffic.						
M56-C	New England Hwy	Thompson St	Francis St	715	SBPL	Establish shared parking and bike lane, with full line marking, pavement logos and signage. If spatial constraints are significant, continue BAZ treatment.	High	RTA				
						Implementation of on-road bikeway along this section needs to consider treatment of other obstacles and safety issues, such as raised cats eyes, potholes and debris in shoulder, driveways from commercial premises e.g. Beaurapairs driveway is raised and protrudes into carriageway.						
						Integrate bikeway / line marking with new signals proposed for Rutherford Rd / NE Hwy intersection.						
M56-D	Maitland St	Francis St	Sydney St	375	BAZ	Continue the BAZ treatment on southern side. Transition to exclusive	High	RTA				
				40	EBL	DIKE lane as the facility it approaches the Sydney Street intersection.						

ROUTE	ROUTE NAME	ROUTE SECTION		APPROX	FACILITY	Y IMPLEMENTATION COMMENTS	Priority	RESPONSIBILITY
NUMBER		From	То	LENGTH (M)	Түре			
New Eng	land Highway / Maitla	nd Street (Northern S	ide)					
M57-A	New England Hwy	Bimbadeen Dr	Wayfarer Motel	550	EBL	Commence treatment on northern side with an exclusive bicycle lane, from the Eastbrook Links Estate. This treatment is suitable due to lack of space and minimal on-street parking demand.	High	RTA
						Integrate bike lanes / line marking with new signals proposed for Bimbadeen Dr/ NE Hwy intersection.		
M57-B	New England Hwy	Wayfarer Motel	St Andrews Pl	455	BAZ	Continue as a BAZ treatment on northern side as route approaches the town's built-up area.	High	RTA
M57-C	New England Hwy	St Andrews Pl	Bell St	640	EBL	Establish an exclusive bike lane along this section.	High	RTA
M57-D	Maitland St	Bell St	Gyarran St	280	BAZ	Continue as BAZ treatment approaching the CBD, due to spatial constraints and on-street parking demand.	High	RTA
M57-E	Maitland St	Gyarran St	Wilder St	120	SBPL	Provide a full shared bicycle and parking lane over this short distance due to the expansive kerbside area and to formalise bicycle movement.	High	RTA
M57-F	Maitland St	Wilder St	Sydney St	390	BAZ	Continue as BAZ treatment approaching Sydney St. Then transition to	High	RTA
				40	EBL	exclusive bike lane a short distance from the intersection.		
M56 / M57	Maitland St	Rutherford Rd	Sydney St	na	Signage	Remove and replace redundant bike lane signage along Maitland St, coinciding with other proposed on-road bikeway improvements.	As required/ timed with other works	MSC / RTA
M58-A	New England Hwy / Muswellbrook Golf Course	Thompson St Bell St	Bell St	270	NP	Council should negotiate with Muswellbrook Golf Club to investigate purchase or land swap, for a small portion of land along the southern boundary of the golf course fronting the highway, between Bell St and Thompson St.	Negotiation with golf club (High) New Path	MSC
						This is a popular desire line for unregulated pedestrian access through private land. It would benefit from construction of a formal pathway (2.0m wide) coinciding with RTA's planned installation of new signals at the Thompson St intersection.	(Medium)	
						It would have the added benefit of improving safety for school and TAFE cyclists/ pedestrians accessing the Bell St connection to northern suburbs.		
M58-B	Maitland St	Bell St	Gyarran St	240	NP	Provide a new section of path (1.2m wide) on the northern side for route continuity and to address the missing link between Bell and Gyarran Sts.	Medium	MSC / RTA

Route Number	ROUTE NAME	ROUTE SECTION		Approx Length (m)	Facility Type	IMPLEMENTATION COMMENTS	Priority	Responsibility
New Eng	land Highway / Bridg	e Street						
M59-A	Bridge St	Manning St	St Heliers St	1,090 (total / both sides)	EBL	Formalise narrow kerbside lane to create exclusive bicycle lanes on both sides approaching Muswellbrook CBD from the north. The shoulder narrows significantly over short distances – provide yellow advisory pavement logos where this occurs for route continuity and improved safety.	Medium	RTA
M59-B	Bridge St	St Heliers St	William St roundabout	1,370 (total / both sides)	BAZ	Implement a BAZ treatment along both sides of this section. This will formalise bicycle movements and safety through this busy CBD precinct, coinciding with high on-street parking demands, vehicle manoeuvres from adjacent driveways, high traffic volumes and intersection crossings. Erect signage along the main street to reinforce the low speed environment, raise awareness and to create "shared zone" for motor vehicles and cyclists.	Medium	RTA
M59-C	Rail line underpass (Bridge St/ Sydney St)	William St roundabout	Maitland St	390 (total / both sides)	BAZ / SZ	Provide route continuity between William St and Maitland St utilising a combination of the BAZ and Shared Zone treatments for on-road bicycle access into and out of the CBD. This is required to formalise the route, raise motorists' awareness and improve safety through this highly constrained squeeze point for cyclists. Refer to Appendix A – Map A3 for full implementation details.	Medium	RTA
M60	Muscle Creek pathway (underpass)	Fitzgerald Park	Muscle Creek	70	Path Closure	 Decommission the existing "dead end" path along Muscle Creek where it terminates under Bridge St. This is a significant public safety risk, and should be addressed as a high priority. The facility cannot be adequately upgraded without major capital investment. Therefore, carry out more cost effective actions which can be implemented quickly: Close existing pathway. Direct pedestrians and cyclists along the upper path through Fitzgerald Park, where it joins existing paths for CBD access. Provide pedestrian/ cycle access at street level to existing rail line crossing point at William St. Improve route legibility between Simpsons Park and William St with highly visible directional signage. Refer to Appendix A – Map A3 for full implementation details. 	High	MSC
Route Number	ROUTE NAME	Ro <i>Erom</i>	UTE SECTION	Approx Length (m)	FACILITY TYPE	IMPLEMENTATION COMMENTS	Priority	Responsibility
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D1-A	Turtle St	Palace St	Sandy Creek Path	50	NP	Construct short section of new off-road path (1.2m wide) on southern side of Turtle St, from the community hall and connect to Sandy Creek Path.	Medium	MSC
D1-B	Turtle St	Creek crossing	Paxton St	100	NP	Construct short section of new off-road path on northern side of Turtle St (1.2m wide) to provide route continuity with existing path (Note: southern side spatially constrained by trees and utility poles).	High	MSC
D2	Sandy Creek Path	Turtle St	Macaulay St	na	Signage	Deploy signage at regular intervals and access points along the Sandy Creek Path, including distance markers, directional signage and interpretive information. Signage will enhance pathway use and appreciation by residents and visitors.	Medium	MSC
D3-A	Hyde Park	Macaulay St	Babbington St	260	NP	Extend Sandy Creek Path to the south, through Hyde Park as a logical extension of Denman's main recreational route.	Medium	MSC
						Construct a new 1.8m-2.0m wide shared path around the northern and eastern boundaries of Hyde Park, terminating at the playground. Provide shaded rest stops/ seating at strategic locations on-route overlooking the park and playground.		
						Continuation of the path along the creek is not recommended through Hyde Park, given close proximity to the oval / cricket wicket (encroaches on playing area, creating safety issues).		
D3-B	Macaulay St	Palace St	Hyde Park	105	NP	Construct short section of new off-road path (1.2m wide) on southern side of Macaulay St to provide connectivity to Hyde Park and the Sandy Creek Path.	Low	MSC
D3-C	Macaulay St	Hyde Park	Virginia St	220	NP	Construct new off-road path (1.2m wide) on northern side of Macaulay St between Hyde Park and the caravan park. At this point, path construction should switch to the southern side through to Virginia St, as a large drain limits available space on the northern side.	Low	MSC
D4	Babbington St	Virginia St	Hyde St	250	NP	Construct new off-road path on the northern side of Babbington St to complete the recreational pathway circuit. A 1.2m wide path will be adequate in this location. An engineering solution is required for the squeeze point at the creek crossing.	Very Low	MSC
D5	Virginia St	Babbington St	Bright St	205	NP	Extend Virginia St pathway (1.2m wide) on the eastern side, from Babbington to Bright St, to service the southern end of Denman.	Very Low	MSC
D6	Rosemount Rd	Virginia St	Surveyor Generals Dr	295	NP	Construct new 1.2m wide path on southern side of Rosemount Rd to service existing residences and the future town expansion area.	Timed with future res. development	MSC / Developer
D7	Arbor Park	Virginia St	Ogilvie St	420	NP	Construct new north-south path meandering through Arbor Park to formalise an existing pedestrian desire line through the reserve. This may require the replacement or realignment of some existing older paths. Connect new path to rail line crossing. Desirable width is 1.5m -1.8m.	Medium	MSC
						Path development should be complemented by other facilities to create an enhanced park setting for residents and visitors e.g. shade, seating,		

ROUTE	ROUTE NAME	ROUTE SECTION		APPROX	FACILITY	IMPLEMENTATION COMMENTS	PRIORITY	RESPONSIBILITY
NUMBER		From	То	LENGTH (M)	Түре			
						landscaping, signage, interpretive information, night lighting, picnic tables and water point.		
						The path will also improve public access to the town centre, Denman Recreation Area, and hospital / retirement village.		
						Arbor Park would benefit from a landscape master plan to guide overall site planning and landscape elements.		
D8-A	Turner St	Ogilvie St / Rail Crossing	Almond St	350	NP	Construct new off-road path (1.5m wide) on western side of Turner St to provide access to Denman Recreation Area and the Almond St residential area.	Timed with future res. development	MSC
						This action supports the "West Denman Road Strategy" and will improve east-west (cross-town) access for pedestrians and cyclists.		
D8-B	Denman Recreation Area	-	-	na	Т	Establish a 1.5m - 1.8m wide trail linking activity areas within Denman Recreation Area and providing a "loop" circuit for recreation and fitness. The preferred surface treatment is decomposed/ compacted granite to reflect the natural aesthetics of the area, and to provide a more cost effective solution than concrete or asphalt.	Timing as per Master Plan	MSC and community groups
						Trail development should be implemented in accordance with the "Master Plan for Denman Recreation Area" (June 2008).		
D9-A	Virginia St	Isabel St	Merton St	420	NP	Replace existing on-road bike lanes with a new off-road path on the eastern side of Virginia St to service Denman Public School and surrounding catchment area. On-road bikeways are considered unsuitable for primary school aged children.	High	MSC
						A 1.8m wide facility is desirable however 1.5m may be more achievable due to spatial constraints. Also remove "bike route" signage to discourage children from cycling with traffic on roads.		
D9-B	Virginia St	Merton St	Kenilworth St	365	NP	Extend new path on eastern side of Virginia St from Denman Public School to Kenilworth St. A 1.2m-1.5m off-road facility will be suitable over this section to service the northern end of town.	Low	MSC
D10	Kenilworth St	Virginia	Palace St	400	NP	Construct new off-road path on southern side of Kenilworth St. A 1.0m wide off-road facility will be suitable in this location.	Very Low	MSC
D11	Paxton St	Merton St	Crinoline St	335	UP	Upgrade / widen the existing path on the western side to provide a higher standard of service for the two adjacent primary schools. The existing path receives high volumes of cycle/ pedestrian traffic at peak times – an upgraded facility suitable for shared use is needed, particularly at the Crinoline St end. A high quality 1.8m wide facility is desirable along the full length of this section.	High	MSC
						Highly visible signage should also be deployed along this route (shared path sign, advance warning signs at road crossings for approaching motorists).		
1				1				

ROUTE	ROUTE NAME	Route Section		APPROX	FACILITY	IMPLEMENTATION COMMENTS	Priority	RESPONSIBILITY
NUMBER		From	То	LENGTH (M)	IYPE			
D12-A	Palace St	Crinoline St	St Josephs School	140	UP	Replace the narrow path on the western side of Palace St with a new 1.8m wide facility, to improve the level of service and safety for children travelling to St Josephs Primary School.	High	MSC
						The existing path is in very poor structural condition with substantial cracking, subsidence and overgrown grass.		
D12-B	Palace St	St Josephs School	Merton St	195	NP	Extend the 1.8m wide path along the western side of Palace St from St Josephs School to Merton St. This path is required to formalise an existing pedestrian/ cycle desire line.	High	MSC
						There is no scope for pathway construction (without substantial cost) between Merton and Kenilworth Sts due to "hard" constraints i.e. deep drainage channel and utility poles.		
D13	Merton St	Virginia St	Palace St	395	NP	Construct new path on southern side of Merton St to complete the local area network and facilitate safer access to both school campuses. A minimum width of 1.5m is desirable.	Low	MSC
D14-A	Ogilvie St	Virginia St	Palace St	na	Signage	Erect signage along the main street to reinforce the low speed environment, and to create "shared zone" for motor vehicles and cyclists.	Medium	MSC
D14-B	Ogilvie St	-	-	na	Crossing Treatment	Establish a "zebra crossing" at the Paxton/ Ogilvie Street intersection. This is required to formalise the crossing and improve safety for pedestrians and cyclists, particularly those travelling north-south to school through the Ogilvie Street precinct.	Medium	MSC
D15-A	Bell St	Almond St	Pony Club	555	NP	Establish a new path along Bell St to service the town expansion area, in accordance with the "West Denman Road Strategy".	Timed with future res.	MSC / Developer
						Note: "West Denman Road Strategy" specifies a width of 2.0m, however, 1.5m should provide an adequate level of service in this location.	development	
D15-B	Bell St	Turner St	Almond St	135	NP	As per treatment for Route D15-A	Timed with future res. development	MSC / Developer
D16	Almond St	Bell St	Bray St	310	NP	As per treatment for Route D15-A	Timed with future res. development	MSC / Developer
D17	Bray St	Almond St	Turner St	130	NP	As per treatment for Route D15-A	Timed with future res. development	MSC / Developer
D18	Turner St	Bray St	Kenilworth St	345	NP	Establish a new path along Turner St (northern end), including upgraded rail crossing, in accordance with the "West Denman Road Strategy". Note: "West Denman Road Strategy" specifies a width of 2.0m, however, 1.5m should provide an adequate level of service in this location.	Timed with future res. development	MSC / Developer

6.5. FUNDING THE NETWORK

Major funding sources for development of the walk and cycle network will be:

- Council's annual budget.
- State Government programs (primarily RTA).
- Developer contributions.
- Community benefit fund sourced from mining industry based in Muswellbrook Shire.
- Commonwealth Government programs.
- Grants from other agencies.
- Roadwork projects which may incorporate sections of pathway or bikeway.
- Sponsorship from the private sector e.g. route signage.

These sources include both fully or partially funded works. In some instances, a combination of different funding sources can be pursued by Council to help implement walk and cycle projects.

Council's forward planning and development approval processes provide valuable opportunities to achieve more coordinated implementation of the walk and cycle network. Consideration of developer contributions towards the network should be assessed for all development applications before Council. This contribution can be in the form of:

- Land resumption or easements;
- Pathway and bikeway construction; and/ or
- Financial contribution.

6.6. OTHER ACTIONS TO SUPPORT THE NETWORK

Building on the Network Implementation Plan, it is recommended that Council:

- 1. Progressively upgrade and develop new pathways, bikeways and trails in Muswellbrook and Denman, in accordance with this strategy.
- 2. Utilise the proposed network as the framework for more detailed investigations.
- 3. Review Council's existing design standards for pathway and bikeway construction and maintenance, with particular reference to:
 - Austroads Guide to Traffic Engineering Practice (Part 13 Pedestrians; Part 14 Bicycles).
 - NSW Bicycle Guidelines (RTA, 2003).
 - Planning Guidelines for Walking & Cycling (NSW Government, 2004).
 - Action for Bikes Bike Plan 2010 (NSW Government)¹⁰.

¹⁰ Note: "Action for Bikes – Bike Plan 2010" is currently under review by the RTA.

- 4. Carry out technical investigations and prepare detailed designs for individual pathway and bikeway projects, including cost estimates.
- 5. Prepare the Section 94 Contributions Plan to support provision of the walk and cycle network.
- 6. Allocate additional funding for programmed maintenance of existing pathways in Muswellbrook and Denman, to provide a higher level of service.
- 7. Articulate path and bikeway priorities to the RTA where facilities are proposed on State Controlled Roads, to help accelerate improvements and to ensure projects are considered in the RTA's programming for road upgrades/ construction.
- 8. Where opportunity presents, identify lower cost / high benefit projects on Council controlled roads that can be implemented in the short to medium term e.g. coinciding with road improvements and maintenance.
- 9. Make provision for pedestrians and cyclists coinciding with future construction or upgrades to bridges, rail crossings and intersections.
- 10. Implement marketing and promotion activities in cooperation with the relevant organisations to encourage public utilisation of the network. Also facilitate ongoing community feedback in respect to network performance, safety and needs.
- 11. Integrate universal access design considerations for network users with special mobility needs in accordance with Australian Standards e.g. paths at acceptable grades and widths, suitable surface treatments.
- 12. Develop a new signage strategy for the walk and cycle networks in Muswellbrook and Denman. Signs should serve different purposes across the network, and be erected to display the following information:
 - Distance and Direction Assist pedestrians and cyclists to navigate their way around the network e.g. distance of routes; direction to a destination.
 - Identification Showing that a destination, point of interest or specific route has been reached.
 - Regulatory Enforced by law.
 - Warnings and Safety On potential risks or hazards not directly obvious to network users, and warning signage for approaching motorists where appropriate.
- 13. Support network development with strategic deployment of end-of-trip facilities (e.g. bicycle parking) and other on-route facilities (e.g. rest stops, water points, lighting of key routes).
- 14. Implement measures to improve the personal safety of network users reflecting CPTED design principles e.g. installation of lighting on key routes, regular maintenance, avoidance of "at risk" locations, providing routes with good sight distance and casual surveillance.

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Examples of Network Signage and Support Facilities



Signage on busy shared route to reinforce pathway etiquette



Regulatory sign for an on-road

bike lane



Advisory sign designating a bicycle route



Directional and distance signage



Bicycle parking rack

Recreational path and rest stop

APPENDIX A

Network Maps – Muswellbrook





MUSWELLBROOK SHIRE COUNCIL Walk and Cycle Plan for Muswellbrook and Denman

MAP A1 - Proposed Walk & Cycle Network [Muswellbrook CBD & Northside]

EXISTING FACILITIES	PROPOSED FACILITIES						
Existing Paths	New Off-Road Path	On-Road Bikeway					
Open Space / Recreation (Public)	Path Upgrade	Strategic Ped / Cycle Route					
Open Space / Recreation (Private)	Recreational Trail	•••• Upgrade Route Signage					
Existing Cycle / Ped Crossing	Path Closure	New or Upgraded Crossing Point					













ON-ROAD BIKEWAYS AT RAIL UNDERPASS

Section 1

Integrate small bicycle logos with existing edge line on both sides of road pavement approaching rail underpass from northern end (Bridge St side).



Significant spatial constraints exist through this short section with limited scope for pavement logos.



Integrate small bicycle logos with existing edge line on both sides of road pavement approaching rail underpass from southern end (Sydney St side).

New line marking may be required for some sections.



Implement full BAZ treatment on both sides between Maitland and Haydon Streets.

MUSCLE CREEK PATH (AT UNDERPASS)

Muscle Creek path is not functional or safe without major capital works - more cost effective options are recommended as follows:

1. Decommission existing "dead end" path along Muscle Creek (i.e. access underneath road).

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2. Direct peds / bikes along upper path from Fitzgerald Park, where it joins to existing paths for safe CBD access.

3. Provide cycle / ped access at street level to existing rail line crossing point at William St.

4. Improve path and route legibility from Simpsons Park with directional sigange via Market & William Sts.

MUSWELLBROOK SHIRE COUNCIL Walk and Cycle Plan for Muswellbrook and Denman

MAP A3: Recommended Treatment for Rail Underpass and Muscle Creek Path





MUSWELLBROOK SHIRE COUNCIL Walk and Cycle Plan for Muswellbrook and Denman

MAP A4 - Network Implementation Priorities [Muswellbrook CBD & Northside]

EXISTING FACILITIES



Existing Paths

Open Space / Recreation (Public)



Open Space / Recreation (Private)

Existing Cycle / Ped Crossing

TIMING OF PROPOSED WORKS

Very Low Priority



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Medium Priority





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New / Upgraded Crossing Point (Timed with adjacent works)

Timed Priority (Cycle / ped facilities staged with future development)



APPENDIX B

Network Maps – Denman





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MUSWELLBROOK SHIRE COUNCIL
Walk and Cycle Plan for
Muswellbrook and Denman
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MAP B1 - Proposed Walk & Cycle Network [Denman Township]







MUSWELLBROOK SHIRE COUNCIL Walk and Cycle Plan for Muswellbrook and Denman

MAP B2 - Network Implementation Priorities [Denman Township]





Open Space / Recreation (Public)

Open Space / Recreation (Private)

Existing Cycle / Ped Crossing

TIMING OF PROPOSED WORKS

	High Priority				
	Medium Priority				
	Low Priority				
• • • •	Very Low Priority				

Timed Priority (Cycle / ped facilities staged with future development)

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New / Upgraded Crossing Point (Timed with adjacent works)