Cycleways Along Railway Corridors

Final Report to
NSW Department of Transport

Bruce Ashley Environmental Consulting
February 1997

Study Team and Acknowledgments

The report has been prepared by Bruce Ashley Environmental Consulting for the Department of Transport NSW, under the direction of Matt Faber, Manager, Network Structure, Planning Division, Department of Transport. The study team consisted of: Bruce Ashley (study manager and report preparation), Greg Boxall (research and field assistance), Rod Katz (editing) and sub-consultant input from Connell Wagner, Cycle Planning, Centre for Leisure and Tourism Studies and Godden Mackay. Library research assistance was provided by Jenny Pidcock, and this is gratefully acknowledged.

Assistance with information and material provided by Andy Clarke (Rails-to-Trails Conservancy), Mark Plummer (Australian Rails to Trails), Russell Small (WA Ministry of Sport and Recreation), and Sue Halstead-Lyons (Victorian Department of Conservation and Natural Resources) is acknowledged. Thanks also to officers within DoT and State Rail, Rail Access Corporation, and Rail Services Authority who assisted with the study. Access to information on disused railway lines in NSW contained in a report to State Rail by Tim Brodie, is acknowledged. Many thanks to, the many Bicycle User Groups and individuals who provided valuable information to assist the study, and to Jeff Hunter, MP Lake Macquarie, for providing material on the Toronto-Fassifern Greenway-1 rail-trail.

ISBN 0 7313 0296 6
Text Printed on 100% recycled paper

Foreword

This study investigates the issues and opportunities for cycleways along railway corridors. It has been prepared for NSW Department of Transport to assist in the implementation of an integrated transport policy. The study was prepared over the period September 1996 to February 1997.

The Draft Report title for this study was *"Cycleways Along Railway Easements"*. Since the terms "rail corridor", "railway easement", or "railway reserve" are often used interchangeably, and can cause confusion, the title of this Final document was changed with the word *Corridors* being used instead of Easements.

This report is accompanied by a video tape documenting the key proposals and an Executive Summary on computer diskette. The study process included consultation with Bicycle User Groups in NSW and railway authorities, and compilation of relevant information found on Internet sites world wide.

Definition of Terms

ballast - a layer of broken stone or other material deposited above the formation level of a railway to serve as foundation for the sleepers and rails

cycleway - pathway constructed of smooth surface suitable for use by cyclists and/or shared pedestrian use

lease - letting of a portion or whole of land under contract for the sole use and management of the lessee

license - contract or agreement for an individual or organisation to use or undertake an activity on a portion of land with the agreement of the owner

permanent way - or "perway" in its shortened form, is a civil engineering term describing the ballast, sleepers and rails forming the finished track for a railway (as distinct from a *temporary way* laid by a contractor for use on construction works transporting material)

rail-trail - a pathway, cycleway or multi-use trail located within or closely parallel to an active or disused rail corridor

rails-to-trails - removal of disused railway or "perway" and converting this to a multi-use trail or cycleway

rails-with-trails - establishment of a trail (generally within the rail corridor) alongside an active rail line

railway corridor - a narrow strip of land owned by the railway which has a boundary and in which the perway or finished track is laid. Used interchangeably with the terms, "railway reserve" and "railway easement".

railway easement - can be defined as:

- a legal term for the right of way over a portion of land within the rail corridor: e.g. for access pathway or road, utility services, etc., or,
- a common terminology for the entire strip of railway land, in the same context as "railway corridor" or "railway reserve"

railway reserve - land dedicated or set aside for railway use, in the same context as "railway corridor" or the second definition given above for "railway easement"

veloway - a cycleway constructed to high design standards characterised by high design speed; directness; few situations where a cyclist must slow down and lose momentum; night lighting

Abbreviations used in the Report

AADT	Annual Average Daily Traffic
ART	Australian Rails to Trails Society
BUG(s)	Bicycle User Group(s)
COM	Committee of Management
DCNR	Victorian Department of Conservation and Natural Resources
DL&WC	NSW Department of Land and Water Conservation
DoT	NSW Department of Transport
GMR	Greater Metropolitan Region
ISTEA	Intermodal Surface Transportation Efficiency Act (U.S.)
LGA	Local Government Area
NMT	non-motorised transport
NPWS	National Parks and Wildlife Service of NSW
RAC	Rail Access Corporation NSW
RSA	Rail Services Authority of NSW
RTA	Roads and Traffic Authority of NSW
RTC	Rails-to-Trails Conservancy (US)
SRA	State Rail Authority of NSW
T-FGC	Toronto-Fassifern Greenway Committee
TRM	Thirlmere Railway Museum

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SUMMARY

Background and Objectives

This is a timely opportunity to investigate the potential for innovative use of railway corridors to encourage cycling and complement bicycle transport initiatives. Railway corridors can be used to provide relatively safe off-road links in the bicycle and pedestrian network and to rail stations, and to provide strategic connections across physical barriers. Disused railway corridors, rather than being a liability, could be converted to multi-use trails that would create new tourism and leisure experiences. This "Cycleways Along Railway Corridors" study investigates these opportunities, and was guided by the following objectives:

- identify where railway corridors can provide strategic connections in the urban bicycle network
- identify "rails-to-trails" leisure and tourism opportunities along disused or seldom-used railways
- recommend a realistic and practical works program to capitalise on these opportunities.

Goals

Within context described above, goals that should underpin government rail-trails initiatives are:

- *to make optimum use of rail corridors to enhance cycling as a transport mode*
- *to achieve community benefit by providing leisure and recreation opportunities along (mainly disused) rail corridors*
- *to develop multi-use trails in a manner that benefits railway patronage and maintenance of assets*
- *to ensure that any proposal for rail-trails do not compromise rail operations or assets, or the integrity of the corridor itself.*

Benefits of Rail-Trails

The study documents benefits and opportunities of rail-trails. They are positive developments because they:

- allow for shared use of the rail corridor, implying the space is used more effectively
- provide opportunities for recreation and tourism -- boosting visitation and increasing the length of stay
- improve the safety and accessibility of cyclists travelling to public transport nodes and connections in the bicycle network
- can provide economic benefits through reduced maintenance costs of disused corridors
- can bring social benefits to the local community.

Literature and Consultation

A review of literature was a significant component of the study process. Information exists on rails-to-trails but less so for rails-with-trails. Much of the rail-trail information is from the US and UK, with Victoria and Western Australia being the main sources of information in Australia. The review of information sources also included recent material and information

carried on the many Internet sites established throughout the world. The consultants undertook a literature search using a range of databases and holdings of major relevant libraries. During the course of investigations, the consultants contacted approximately 50 officers within 25 authorities, mainly at the State and Local Government level, and all Bicycle User groups in NSW.

The Rail-Trails Experience

The rail-trails movement has taken off in the United States and in the UK particularly in the last decade. Organisations such as the Sustrans in Great Britain, and US Rails-to-Trails Conservancy (RTC) have foreseen the tremendous opportunity that disused rail corridors provide. They enable continuous corridors at easy grade, well suited to non motorised transport.

In Britain, community group Sustrans is the major force behind the conversion of disused rail lines to community pathways. Routes exist or are in progress throughout the UK, and Sustrans have in place or scheduled some 40 routes covering a total of 300 km.. Sustrans has recently been awarded a £47 million grant from the Millennium National Lottery Fund. This will enable the completion of a 2,000-mile network of cycle paths through the whole of Great Britain by the year 2000, and a further 3,000 miles by the year 2004

In the United States more than 160,000 miles of lines are now out of service: only 140,000 miles of active rail line remain, with plans to reduce the core system to 100,000 miles. The Rail-to-Trails Conservancy (RTC) in the United States has taken on the role of champion of rail-trails. Established in 1985, RTC is a national non-profit charity with over 50,000 members and a staff of over 40 people. Each year, 90 million people make use of the USA's 821 rail-trails totalling over 13,000km.

Most of the Australian States, including NSW, have examples of commuting cycleways running alongside or within an active rail corridor. The study discusses the rail-trails experience in those Australian states where there are rail-trails.. Formed in 1993, the Australian Rails to Trails Society promotes and supports local rails-to-trails groups with the objective of establishing a wide network of paths and linear nature reserves. In NSW there are many current examples of both rails-to-trails and rails-with-trails. The key differences between NSW and the experience of rail-trails Australia wide and overseas are:

- lower populations density and density of the disused rail network in NSW compared with other locations -- leading to lower potential use and relative absence of local support needed to maintain the facilities
- rail infrastructure has remained in place and there is legislation preventing removal
- there are many other off-road recreational opportunities for walking and cycling in NSW
- the corridor in urban areas is less conducive to long lengths of rails-with-trails parallel to the rail lines, compared to Melbourne and Perth.

Issues and Constraints

The study addresses issues outlined in the study brief, and identifies additional issues and constraints to implementing rail-trails. The issues covered include the broad areas of:

support for rail-trails, safety, ownership and management issues, landholders' issues and integration with other transport networks.

Rail-Trails Opportunities in NSW

A combination of literature review, consultation with rail authorities and interest groups, and review of rail and bicycle planning and network information assisted identification of rail-trail opportunities. A list of potential opportunities was compiled which could then be further assessed. Only the more readily defined and key proposals were taken to the stage of detailed investigation. These were then investigated as case studies. All of the opportunities for rail-trails identified during the study were reviewed in terms of the selection criteria established for rail-trail: expected use; strategic value; feasibility; and destinations served.

The identification and development of rails-with-trails opportunities were also considered in the context of the Integrated Transport Strategy objectives for the Greater Metropolitan Region, the identified bicycle network, and current rail corridor planing information. Although investigations for rails-with-trails opportunities focused on the Greater Metropolitan Region, rail corridors passing through rural population centres may also provide opportunities.

29 rails-with-trails opportunities were identified, along with a summary of the key constraints and a subjective assessment of priority and recommendations for further action. The various categories identified were:

- five opportunities identified as of high priority: Rhodes to Meadowbank utilising the disused Meadowbank railway bridge; East Hills Line, North Arncliffe to Bardwell Park, Conniston to Unanderra on the IIlawarra Line; Maud St on the Main Northern line at Newcastle and extension of the Sydney Harbour Bridge cycleway at Milsons Point on the North Shore line
- 11 opportunities of moderate to high priority
- 11 opportunities of moderate priority
- two opportunities of low to moderate priority

General discussion is made of opportunities in the Sydney metro area, Illawarra, Hunter and regional centres. The overall conclusion for metropolitan regions was that long lengths of rails-with-trails parallel to the rail corridor is not likely to be as feasible as for the proposed veloways in Perth. Focus should be on shorter links where there are poor on-road alternatives or where the terrain not conducive to cycling.

From over 50 publicly owned and disused corridors, totalling some 2,000 km, 13 were felt to have sufficient merit to warrant a closer investigation for developing rails-to-trails facilities. Further to this selection process, three key corridors of differing lengths and characteristic were investigated as ‘case studies.' Of the 13 corridors there were,

- one of high potential: Pippitta to Sydney Olympic Park,
- two of moderate to high potential: Picton to Mittagong and Wagga Wagga to Tumbarumba
- six of moderate potential
- four of low to moderate potential

Detailed costings were prepared for each of the six case studies. This indicates a total funding need of about $3.5million for these higher priority opportunities.

Implementation

Proposals work best when there is public "ownership" supported with resource assistance from government and other appropriate organisations. As a process of 'change management,' planning for, and implementation of rail-trails will require support; with the need for a permanently staffed body to assist in the implementation and administration of rail-trails in NSW being addressed. Initially it would best to house this body under an existing agency rather than set up new offices. It is suggested this be within DoT. For the early stages in rail-trails implementation, this body could consist of an executive officer, rather than a large secretariat. At a later stage, and as needs and resources dictate, this unit could be developed as a secretariat to a 'Rail-Trails Council' or similar, with a formally established advisory committee and inter-agency co-ordination panel. The focus for a rail-trails unit would be for implementation of rails-with-trails facilities, although there would be scope for such a unit to act as an advisory and seed agency for rails-to-trails projects. The suggested tasks for the Rail-Trails Unit are identified.

The sorts of challenges posed by existing legislation and administrative arrangements for rail-trail development are identified, and it is suggested that these issues be addressed by a Rail-Trails Unit with a report to the Minister regarding potential changes to legislation and policy.

Conclusions

Rail-trails provide benefits to localities where they have been built, with potential to enhance the effectiveness of the bicycle network. Consultation from this study shows that there is enthusiastic support at the council and community level, especially for rails-with-trails facilities. The physical and political situation for rails-to-trails in NSW is different in some aspects from examples in Australia and overseas. Use levels for rails-to-trails are likely to be less than in Victoria and Western Australia, and considerably less than in the US and the UK. Because of legislation in NSW, adaptive reuse of corridors is more difficult.

Experience shows that perceived liability and safety risks of rail-trails outweigh actual impacts and risks. Whatever liability and safety concerns there are can be managed. There appear to be no insurmountable safety and liability obstacles to providing cycleways along active corridors, providing there is adequate separation, and proper attention to appropriate design principles. Rail authorities should become pro-actively involved in the development of rail-trails.

Given the lower levels of expected use of rails-to-trails compared with situations overseas and elsewhere in Australia, and the difficulty for most tourist train ventures to be self-sufficient, there is a need for train enthusiasts and rail-trail proponents to jointly develop and manage disused corridors. There are not likely to be the resources in rural NSW for a single group to undertake adaptive reuse of a long corridor. Potential opportunities for rails-to-trails are more limited than other States and overseas. However, because of congested road systems, urban rails-with-trails provide an opportunity to greatly enhance bicycle networks.

Recommendations

Recommendations are made with regard to rail-trails in NSW. In summary it is recommended that:

1. A "Pathways to the Next Millennium" major funding initiative for rail-trails in NSW be developed.
2. Risk management protocols are established, and guidelines prepared to assist in the development of rail-trails projects.
3. Rail-trails concept and development plans are prepared in advance of funding availability and 'ready to go', so that projects can capitalise on funding when it is available.
4. The potential of rail-trails is considered in new infrastructure projects, and rail-trails opportunities are maximised through the integration of various agencies' strategic planning processes.
5. Stakeholders work co-operatively to maximise community resources for adaptive reuse of disused corridors and to undertake joint promotion and marketing on a rail-trails theme.
6. A specifically funded and permanent rail-trails unit is set up within the DoT to investigate, review and provide policy advice on rail-trails.
7. Disused rail corridors (in both public and private ownership) remain intact and are not split up or sold off to private owners.
8. Joint party legislative support be sought to enable changes to the Transport Administration Act 1988, to more easily account for the potential adaptive reuse of disused corridors.

1 INTRODUCTION

1.1 Background to this Study

There is both political and community support for the enhancement of cycling and walking as transport modes. The Department of Transport in NSW (DoT) has recently undertaken initiatives to provide bicycle parking and "easy access" (e.g. ramps and lifts) at rail stations, and bicycle carriage on public transport has been made easier. Rail-trails provide opportunities to link to and enhance the existing and ultimate bicycle network.

Railway corridors are generally constructed along easy grades and bridge physical barriers (such as waterways). Thus, there is a timely opportunity to encourage cycling and complement current DoT initiatives through innovative use of railway corridors. Active rail corridors can be used to provide relatively safe off-road links in the urban bicycle and pedestrian network and to rail stations, and provide strategic connections across physical barriers.

Disused railway corridors, rather than being a liability, could be converted to multi-use trails which would create new tourism and leisure experiences. The situation of disused rail corridors is also being appraised as a result of restructuring of the State Rail Authority (SRA) into four separate bodies. This move to greater fiscal self sufficiency means that liabilities in respect of disused corridors and their potential adaptive re-use are being considered. The future of a number of disused major infrastructure items which have potential use for cycleways also needs to be determined.

1.2 Study Objectives and Outcomes

It is in this context that the Department commissioned a study to provide information on best practice and current examples of providing for cycling along rail corridors.

The study was guided by the following objectives:

- identify where railway corridors (or rail corridors) can provide strategic connections in the urban bicycle network
- identify "rails-to-trails" leisure and tourism opportunities along disused or seldom-used railways
- recommend a realistic and practical works program to capitalise on these opportunities

The consultant was to address the specific issues outlined in the brief and to identify any other issues. These issues are addressed under Section 5.0 of the report. Importantly, the consultant was to provide recommendations that were practical, to recognise budgetary realities and focus quickly on the "most likely" opportunities which could provide strategic connections and maximise community worth, whilst ensuring that the full range of rail corridor opportunities in NSW were at least briefly assessed. The consultant was to ensure that the works program covered implementation and review aspects, yet was detailed enough to enable immediate action by DoT.

There is some degree of overlap between rail-trails categories of active or disused corridors, urban or rural areas, primarily for recreation or commuting purposes. However, it was decided to differentiate between two sorts of opportunities:

- **Rails-with-Trails:** generally commuter cycleways in the Greater Metropolitan areas, mainly (but not always) sharing an active rail corridor
- **Rails-to-Trails:** multi-use trails within abandoned rail corridors (predominantly in rural and semi-rural areas), usually formed by constructing a trail over the former railway formation.

Most preconceptions of rail-trails are of rails-to-trails. This is in line with the overseas and interstate experience discussed in section 4. As will be seen in this study, the opportunities for viable rail-trails in NSW are predominantly along active corridors and are thus categorised as rails-with -trails.

1.3 Study Methodology and Tasks

Methodology
The brief was clearly set out and suggested a relatively straightforward methodology. Given the study time frame and anticipated information sources, it was felt that study effectiveness and quality would be enhanced by:

- using the Internet and computer-aided retrieval to ensure a comprehensive literature review, available in hard copy or computer format for later easy use by DoT
- making best use of the collective experience of key stakeholders to focus quickly on a short-list of strategic opportunities
- adopting a logical and systematic approach: overall principles and issues common to all corridors were to be considered first, then the corridors identified and their viability determined, and lastly site-specific issues within a corridor were to be addressed.

Study Tasks
The key study tasks for this project were:

Undertake consultation
Undertake a literature search and review existing information sources
Respond to issues raised in the brief and identify any further issues
Identify and assess rails-with-trails opportunities in Greater Metropolitan Region
Identify "rails-to-trails" opportunities
Develop a works program
Prepare draft & final reports and accompanying material

Study Outputs
The study provides to DoT at its conclusion:

- computer data output of the Internet web search
- detailed listing of contacts made during the study
- a bibliography containing all relevant references

- presentation to DoT of the Final report
- 10 bound copies of the Final Report (plus diskette in WP for Windows format, and any other text or data on disk) plus necessary documentation.
- a video documenting key opportunities investigated, and selected colour photographs on computer diskette.

1.4 Goals for Cycleways Along Rail Corridors

Within the context described above, four goals were put forward during the course of the study, which underpin the overall purpose of the DoT's initiative with respect to cycleways along rail corridors. These four goals and their specific objectives are presented below.

GOAL - to make optimum use of rail corridors to enhance cycling as a transport mode

Specific Objectives:

a) where feasible, to construct pathways over easements within rail corridors to provide strategic connections in the urban bicycle network and community path system

b) where feasible, to make use of active or disused rail infrastructure such as bridges, viaducts and tunnels, to provide relatively short-distance but strategic links in the bicycle network.

GOAL - to achieve community benefit by providing leisure and recreation opportunities along (mainly disused) rail corridors

Specific Objectives:

a) realise the full potential for recreation opportunities and community use of rail corridors by the widest range of users

b) develop those (mainly disused) corridors which enhance and complement other opportunities for adventure travel and outdoor recreation

c) ensure that adjoining rural landowners/users are involved in the consideration of any proposed trails along rail corridors.

GOAL - to develop multi-use trails in a manner which benefits railway patronage and maintenance of assets

Specific Objectives:

a) increase public transport patronage by using rail corridors and railway infrastructure to provide safer and more convenient cyclist and pedestrian access to public transport nodes

b) improve the longer-term economic viability and community use of railway heritage by encouraging, and providing for, appropriate multiple use activities along (mainly disused) rail corridors

c) develop multi-use trails along railway corridors in a way which complements existing and potential tourist railway ventures and regional tourist attractions

d) increase Countrylink and CityRail patronage by concentrating development of rails-to-trails along those corridors where trail users can travel to, or return from, the trails by public transport.

GOAL - to ensure that any proposal for rail-trails does not compromise rail transport operations or assets, or the integrity of the corridor itself

Specific Objectives:

a) develop proposals which are designed and function so as to complement current or reactivated rail transport operations, including maintenance tasks

b) design, construct and operate rail-trails in a way which provides the highest levels of safety for rail operators, land owners, passengers and trail users

c) develop proposals for rail corridors which seek to improve the value, longevity and usefulness of railway assets and infrastructure

d) ensure proposals consolidate the corridor and maintain or improve its intrinsic value.

2 RAIL-TRAIL BENEFITS

2.1 The Trails "Vision"

The rail-trails movement has taken off in the United States and in the UK particularly in the last decade. Organisations such as Sustrans in Great Britain, and the US Rails-to-Trails Conservancy (RTC) have foreseen the tremendous opportunity that disused rail corridors provide in enabling the provision of continuous corridors at easy grade, well suited to non motorised transport (NMT). A study by Moore (1992) of three rail-trails in the US, concluded that: rail-trails can provide a wide range of benefits to users, local landowners and trail communities. An example of such a rail-trail is shown below.

← *Owen Square on the Bristol and Bath railway path, UK, site of the first Sustrans rail-trail - now used by over one million people per year, the most popular cycle route in Britain. Source: Dot (1982)*

The benefits and opportunities of rail-trails are that they:

- allow for shared use of the rail corridor, implying the space is used more effectively
- provide opportunities for recreation and tourism - boosting visitation and increasing the length of stay
- can improve the safety and accessibility of cyclists travelling to public transport nodes and provide connections in the bicycle network
- can provide economic benefits through reduced maintenance costs of disused corridors
- can bring social benefits to the local community.

All the Australian States are now considering the benefits of either allowing NMT users to access rail corridors, or of converting disused corridors to trails. The WA Ministerial Taskforce on Trails (Trailswest) report found that many disused corridors are ideal for conversion because of the potential for environmental conservation, ecotourism, education and outdoor recreation (Ministerial Task Force, 1995). They also found:

"...disused rail reserves have excellent potential....they encourage access by all population and user groups due to their gentle grades and absence of motor vehicles".

Similarly, in Victoria, the Department of Conservation and Natural Resources found that rail-trails can offer benefits of: easy gradients, gentle curves, bridging of creeks and rivers, links between population centres, attractive settings, varied landscapes, and access to points of natural and cultural interest. (Dept. Cons & Nat. Resources, 1994)

The question of whether these benefits also apply in the NSW context, was an issue for this study to consider. With limited funding and resources there is a need to prioritise works and make trade-offs between benefits and costs.

2.2 Opportunities Provided by Rail-Trails

2.2.1 Quality of Life and Community Benefits

A trails network can play an important role through its unifying effect on rural communities. Often these communities have been alienated by the closing of unprofitable rail lines. Trails can provide a "sense of place" - a meeting place and backyard, particularly in semi-urban areas (RTC, 1996). The Conservancy have put this eloquently in their document *Reconnecting America*, where they see rail-trails or "greenways" as a physical and spiritual linkage, and a means of improving landscapes (Ryan, 1994).

As evidenced by the recently completed four kilometre "Greenway-1" cycleway at Toronto, on the western shores of Lake Macquarie, smaller and more isolated communities take substantial pride in the work that they can achieve at a local level in converting and maintaining rail-trails. The Greenway-1 Proposed Plan of Works (Toronto-Fassifern Greenway Committee, 1994) cited the cycleway/pathway as offering benefits to the community by providing alternative and safer commuter options to work and schools, better access to foreshore, cultural, natural heritage and community precincts, providing a facility for healthy living and as having tourism potential. These sorts of projects can also be seen as having cultural community benefits - as an aboriginal site adjacent to the route is now regarded as a "meeting place" for the diverse cultures in the area.

← *Toronto-Fassifern rail-trail 'Greenway-1' at the disused platform, Toronto Station.*

As reported to the South West Trails Conference by Stidwell (1994) there is a very high community demand for trails, particularly by the education and adventure tourism sectors. Stidwell stressed the importance of local community ownership, stating that if there is no local ownership the project will fail. *"If we have people locally committed and proud of their area, we are going to have a lot more people coming to this area to use it"*.

The fact that rail-trails can be of great benefit for local communities is evidenced by offers of money, materials and labour when proposals are put forward. Such was the case with the Otago Central Rail Corridor in New Zealand's South Island where the local community has enthusiastically offered cash donations and organised fund raising festivals (DOC, 1994).

A brochure prepared by the RTC on the US Intermodal Surface Transportation Efficiency Act or ISTEA, provides strong supportive statements as to the community and economic benefits of rail-trails (RTC, 1996a). Extracts from this paper are reproduced as **Appendix 1**. However, it must also be recognised that many of the multi-use trails referred to in the US and UK literature service significantly greater population densities than is the case in NSW, even in the case of fringe areas of the Greater Metropolitan Region. The benefits for closely settled communities from rail-trails is illustrated by Sustrans:

> *"The Bristol pathway now carries over 1 million users each year: children, teenagers, family groups, mothers with prams, elderly people, people with disabilities of all kinds, and a host of others who have rediscovered how pleasant travelling by bike or foot can be" (Sustrans 1994)*

2.2.2 Opportunities for Non-Motorised Transport

In the face of high pollution levels caused mainly by motor vehicle emissions and predicted climate change due to greenhouse gas emissions, Australian cities are looking for ways to reduce car dependency. The situation may become even more urgent as there are some who argue that the oil is running out faster than most believe. According to Fleay (1996), Australian cities will need to reduce their oil consumption to about 30% of current levels by 2025. At the moment use is continuing to increase at a rate of 3-4% per annum The factors which make cycling trips an easy replacement for oil use include the low cost of bikes and cycling facilities, well tried technology, and the capacity for rapid growth in use.

It is encouraging to see from results of the *Clean Air 2000 Monitor of Public Attitudes,* that one of the four solutions selected by respondents which would be most effective in reducing car usage levels in the Greater Metropolitan Region would be to provide better facilities for walking and cycling. Better access to and improved public transport was also among the nominated solutions (NRMA, 1996). Rails-with-trails could very effectively be a part of these solutions.

According to the Draft Integrated Transport Strategy for Greater Sydney (NSW Government. 1993), *"heavy traffic congestion and the dispersal of key activity and employment centres has mitigated against both the appeal and viability of cycling and walking as transport options"*. However they report considerable scope for the substitution of cycling for car use:

> *"One third of car trips are estimated to be 3km or less. These are likely to be trips to transport nodes, convenience shopping trips etc. For many of these trips cycling could substitute for cars, as the average bicycle trip is 2.5km. Cycling and walking rates can be increased by their integration into the design of urban form and transport systems"*

There is value in turning shorter car trips to stations into NMT trips (Faber and Wyatt, 1996), and direct cycle routes to terminals have been cited as one of the special requirements *"to ease the transfer from bicycles to public transport and vice-versa"* (Godefrooij, 1996). Providing more convenient and safer access to transport nodes (such as rail stations) complements two other DoT initiatives supporting cycling: improving carriage conditions for bikes on trains and providing bike lockers at stations. This not only has the potential to reduce car traffic and the need for car parking at stations (costing up to $10,000 per car space), but can also greatly expand the catchment and patronage of the rail system. In relation to NMT, Kenworthy cites the development of bicycle-friendly and bicycle supportive transit systems as one of the three critical areas of land use and transportation planning in cities (Kenworthy, 1996).

Rails-with-trails can also improve access to transport nodes for those requiring wheelchair or hand-cranked cycle access. For instance the Greenway-1 rail-trail at Toronto provides access for people with disabilities along its entire length, particularly at road crossings. Mobility is also improved for those who do not own a car and for when public transport is too far to reach by walking.

Thus there are significant benefits in being able to provide cycleways along active rail corridors (generally in the urban environment), as traffic-free and direct links in the cycle and pedestrian networks, and to other transport nodes such as public transport interchanges. Their utility is great where they can be used to bridge physical barriers, enable cycling along easy grades and facilitate the crossing of busy roads. This avoids two of the of the major disincentives to cycling: hills and traffic. As will be discussed later in section 5, a quality cycling environment and improved links to public transport can support a switch from car to bicycle use.

2.2.3 Improved Health & Safety

Any increase in cycling frequency, whether it is an increase in the number of trips made by current cyclists (which is generally the case) or increase in numbers taking up cycling, will have health benefits as a result of increased exercise. According to Federal data as reported in an article by Professor Harry Owen to the *Velo* conference (Owen, 1996), only 20% of the population undertake enough exercise for optimal cardiac health. Such activity, if encouraged in a low traffic (and reduced vehicle emission) environment will have a positive net benefit on community health, despite any increase in total injury rate. As Owen pointedly states: *"So much (health costs) could be saved by increased cycling that cycling should be funded from the health budgets not transport budgets."*

Off-road cycleways also have a role in improving the safety of cycle trips. Although numbers of accidents can be as high for off-road facilities as on-road cycling, the severity is far less. A survey conducted by North Sydney TAFE students found that cyclists nominated motorists, poor road surface and drains/grates as the three worst hazards facing cyclists (North Sydney College of TAFE, 1996). Many other cyclists surveys report similar findings (e.g. Arup 1993, 1996), pointing to the need to increase access to well designed off-road cycle routes to reduce traffic conflicts and improve cyclist and pedestrian safety.

Rail-trails could function as areas where people of all ages can learn how to cycle and increase their cycling skills. This could encourage non-cyclists to take up cycling and change attitudes towards cycling, perhaps perceived as too dangerous or difficult. The surrounding environment and the easy grades will making cycling an enjoyable activity rather than the dangerous and unhealthy (due to traffic fumes) activity it is perceived as being.

2.2.4 Recreation and Tourism Opportunities

There is a strong leisure focus in Australia, especially for outdoor recreation, given our high levels of mobility, disposable income and agreeable climate. Trailswest cite a trebling of demand for recreation by the year 2000 (from a 1983 base). This translates to profitable ecotourism and adventure commercial enterprises and retail outlets. This view is supported by RTC who point out that reduced leisure time, loss of open space, explosion in use of mountain bikes and in-line skating has created huge demand for close-to-home recreation facilities, particularly trails (Ryan, 1994)

Rail-trails can play a role in nature-based tourism by increasing the diversity of tourism products available, and provide a direct monetary injection into rural economies (Ministerial Task Force, 1995).

Adventure tourism and ecotourism are the aspects of regional tourism which are developing fastest in rural NSW, with backpackers on average outspending all other tourists; although they spend much less per day, they stay far longer in a region than other tourists. Rail-trails can satisfy the four elements of "ecotourism" as defined in the National Ecotourism Strategy (Commonwealth Dept. Tourism, 1994). These elements are:

- the natural environment
- ecological and cultural sustainability
- education and interpretation; and
- provision of local and regional benefits.

The Trailswest report puts forward in a tourism and promotional context the benefits of a trails network versus individual trails. This approach may not be as relevant in NSW due to the greater distances between trail opportunities and the generally cleared nature of the rural terrain compared with say the forested south west of Western Australia. However for the more densely settled areas of the Central Coast of NSW, proponents of Greenway-1 envisage the facility bringing increased opportunity to business in the locality (Toronto-Fassifern Greenway Committee, 1993).

2.2.5 Environmental and Educational Value

Because users of trails travel at a more leisurely pace compared with road and rail travel, contact with surroundings is increased, providing greater opportunity for interpretation of environmental and biological, historical and cultural information (Ministerial Task Force, 1995). The proposal for Greenway-1 described the educational value of the corridor as "unlimited", with the corridor being a valuable educational resource in at least seven areas of the school curriculum including aboriginal studies, ecology, road safety and sport (TFGC, 1993).

Due to the extensive clearing of native vegetation, disused corridors can sometimes provide a reserve and area for conservation, in a similar manner to road reserves. An example of this is the Queanbeyan-Cooma corridor which contains unique flora. Conversely rail corridors can also harbour many species of noxious weeds. Trails management and adaptive use of the reserves can reduce the negative impacts and support positive environmental management. According to the Victorian Department of Conservation and Natural Resources, "*railway reserves play a role as wildlife corridors and habitats for our native birds and animals"*. The Department also undertakes conservation assessments for each disused railway reserve (DCNR, 1994).

2.2.6 Using Corridors for Utilities

In the Greater Metropolitan Region, many of the active rail corridors are used for routing utility services such as gas, high pressure oil pipelines and telecommunication cables. Likewise, disused railway corridors can also be used for these "non-trail" purposes, which can provide a source of contributions for trail development. As reported by RTC, the Northern Virginia Regional Park Authority has discovered not only that many uses are compatible with trails, but also that joint ventures can provide the trail with a new source of revenue. Potentially compatible uses they identified include:

- telephone cables/communication cables
- gas, water and sewer pipe lines
- electricity transmission and distribution lines
- low volume driveways or private trail connections
- garden plots

As a case example in NSW, the Greenway-1 cycleway for a portion of its length was integrated with clearing and laying of a sewer main under the concrete cycleway. This reduced costs for clearing and forming of the track as this was able to be undertaken by the construction authority as part of the rehabilitation works. In a rural setting in NSW, corridor uses include ajistment for stock (especially during drought conditions), leasing for grazing purposes and as an adjunct to Travelling Stock Routes.

3. INFORMATION GATHERING & CONSULTATION

3.1 Information Gathering

Given extensive experience with rail-trails world-wide, and more recently in Australia, a considerable body of information is available to assist in the planning process. Thus, a review of literature was a significant component of the study process. A lot of information exists about rails-to-trails but less so for rails-with-trails. Much of the rail-trail information is very detailed and useful - mostly from the US and UK with Victoria and Western Australia being the main sources of information in Australia.

3.1.1 Search Methodology

The review of information sources was not confined to published hard copy literature but included recent material and information carried on the many Internet sites established throughout the world.

The following methods were used to obtain information:

- literature searching using bibliographies contained in key publications
- library search using CD-ROM, databases and on-line sources
- review of media articles and promotional material
- keyword searches of material contained on Internet sites
- review of postings to Internet news groups
- consultation with authorities and interest groups

Pertinent results from this search are provided below. Information from the sources was reviewed individually and relevant information has been incorporated and cited.

3.1.2 Search Results

Internet Web Sites
An Internet search totalling about 25 hours was conducted using a range of keywords. This also established links to other relevant sites. Best matches to the query were displayed site by site. The relevant sites, and all links, were followed through to the extent they were relevant to the study. Results could be either printed out directly or saved as text format for later key word searching. Documents listed for each phrase (in batches of 10) were accessed until such stage as the results were non-relevant. A summary of the search results is given below in **Table 1**. A copy of sample response from a query and print-out from a "site" and/or related links is included as **Appendix 2**.

Table 1 - Internet Search Results

Search Phrase [count for each word]	**Documents matching query**	**Documents viewed to select sites**	**No. of key sites visited**
"rails [33,496**]** ***to*** [ignored] ***trails*** [1,826,936]**"**	20,000	100	24
" ***disused*** [1,756] ***rail*** [238,104] ***lines*** [1,953,090]**"**	100,000	30	5
"railway [119,131] ***corridors*** *[24,385]***"**	20,000	20	4
"Sustrans"	N/A	10	2
"cycleways [288] ***along*** [1,482,479] ***railway*** [119109] ***easements*** [10,036]**"**	80,000	20	1
"greenways [2,375]**"**	1,000	10	1
"liability [386,722] ***and recreation*** [480,165] ***risk***[1,099,829] ***management*** [5,142,036]**"**	400,000	10	1
"multi-use [4,000] ***trails*** [187,576] ***NSW*** [180,780] ***Australia*** [1,160,959]**"**	100,000	10	1
"rail [240,292] ***safety*** [1,406,864]**"**	100,000	10	-

Most (about 90%) of the relevant sites had been established by US rails-to-trails organisations affiliated with the Rails-to-Trails Conservancy. The information was generally very recent (most sites had been updated in the last 3-6 months) and presented community-based information about the design, use and promotion of rails-to-trails facilities within each State. Few of the sites presented hard data or journal-type articles. Particular sites of note were those of the *Rails-to-Trails Conservancy* (and affiliates) and the *Treasures of the Trail* site.

There were hundreds of local cyclists organisations with sites world-wide, with a handful providing details of rail-trails. Much of the information reproduced material on the RTC sites. The key UK site was the Sustrans site which had information on the Millennium Trails project and the National Cycle Network[1]. Most of the sites could be contacted by email where comments could be left or questions answered.

A compendium of rail sites around the world is the *Interchange* site listing over 2,000 rail related sites world-wide. Two rails-to-trails sites were listed, along with the various DoT agencies (including NSW DoT). Australian rail historical sites in Australia include the *3801* and the *NSW Railway Museum* sites presenting historical accounts and data on assets. The *CityRail* and *State Rail* sites had general information only.

[1] Refer to **Section 4** for a description of these two projects

It was proposed to establish a web site for the study and seek information through Internet News groups. However, with the agreement of the DoT, web site was not proceeded with at this point in time as:

- an adequate amount of information was able to be obtained through other sources
- contact had already been made by letter with most of the relevant interest groups in NSW
- information was readily available through Internet searches, and
- key overseas interest groups could in any case be readily contacted by email

It was therefore proposed to revisit production of the Web site following study completion. Web sites which were relevant and should be referred to include:

Sustrans Home Page
http://www.sustrans.org.uk

3801 Limited - Tourist Railways
http://www.wollongong.asn.au/3801/

Rails-to-Trails Conservancy Update
http://www.westol.com/tat/updates/rtc.htm

West Virginia Rails-to-Trails & Rails-to-Trails Conservancy
http://www.cwru.edu/lit/homes/rxr3/WVRTC/wvrtc.html

Rail-Trail Resource Centre
http://www.rail-trail.org/fredwert/#Pubs

ISTEA and TRAILS: Merging Transportation Needs and Recreation Values
http://www.bts.gov/smart/cat/mtn.html

State Rail - General Information
http://www.railis.nsw.gov.au/info/sra.htm

Canadian Rails to Greenways
http://www.flames.trentu.ca/csmp/rtg.html

(as at October 1996. These URL's may have changed since then)

Literature Search

A literature search was conducted using the following databases: AUSTROM - including APAIS, ATI, CINCH, AGIS; US General Periodicals on Disk and Social Sciences Index; and Engineering and Applied Science Index.
Holdings of the following libraries were searched:

- State Library of NSW

- University of NSW Library
- National Parks and Wildlife Service Library
- CityRail Library
- Department of Urban Affairs and Planning Library
- Information centre of the Ministry of Sport and Recreation WA
- NSW Dept of Transport Library

Key words used were: trails, rails, railroad, bicycling, cycling, cycleways, veloways, rails-to-trails, rail-trails, rails with trails, Bikewest, Sustrans, Rails-to-Trails Conservancy.

Most responses were found for trails in general, with rails-to-trails the next highest response. Very little information was specifically related to rails-with-trails, or liability aspects. Hard copy of the sources was obtained through purchase of the document, loan from authority, inter-library loans or direct printing from CD-ROM database for journal articles. A number of bibliographies were helpful in finding references on the topic of rail-trails and these included:

- DoT library accession list
- Trailswest Report and Bibliography
- Ministry of Sport and Recreation WA Bibliography on Trails
- NPWS Internal Literature Search on Topic *Trails and Liability* (courtesy NPWS Library Hurstville)
- *Bicycle and Public Transport Bicycle Network Bibliography* - UITP Documentation Centre Brussels

3.2 Consultation with Authorities

During the course of investigations, the consultants contacted approximately 50 officers within 25 authorities, mainly at the State and Local Government level. Extensive consultation and information gathering was undertaken with rail authorities and those authorities who had previous experience in the area.

The recent restructuring of the SRA into four separate corporate entities made consultation and information gathering relatively complex, particularly when establishing the various roles of the sections and areas of relevance for this study. Inevitably, given the tight study schedule, and the restructuring, there will be potential points of contact not pursued during this study. However, the key contacts identified by the Senior Managers of the relevant sections have been consulted.

A summary list of the authorities contacted and the respective officers is provided as **Appendix 3**.

3.3 Consultation with Interest Groups

Given the State-wide coverage for this study, and the need to consider practical implementation at site level it was important for the study to utilise the expertise of Bicycle User Groups (BUGs). They were able to assist greatly in identifying cycleway opportunities. It is also important to involve local organisations at the outset, as they will more than likely be the prime movers of any successful proposals.

A current list of the 47 BUG contacts in NSW was obtained from Bicycle New South Wales and letters were sent to each group. In addition, 10 key stakeholder organisations such as rail enthusiasts and equestrian groups, and disability organisations who may have an interest in the railway corridors, were contacted by phone and letter.

To date 19 of the BUGs have responded by phone, fax, email or letter with some of the groups preparing comprehensive and detailed submissions. Only one of the stakeholder groups (Association of Railway Preservation Groups) has responded at the time of report preparation.

A full listing of the groups contacted and a summary of their responses is included in **Appendix 3**.

As would be expected, the cyclists organisations were generally very supportive of the concept of rail-trails, particularly for rails-with-trails and potential commuting benefits. Some were pessimistic that rail authorities would agree to the overall concept. Many opportunities were outlined by the groups. Some groups provided detailed proposals and had much information to provide on specific locations which they had been endeavouring to secure as a cyclist route for a number of years.

In addition to contacts made during this study, Brodie in his study of 25 disused rail corridors in NSW for the SRA (Brodie, 1995), made contact with a large number of railway staff and organisations dealing with land management issues. A summary of the main points each organisation raised at that time is presented below in **Table 2.**

Table 2 - Responses to the Management of Disused Corridors as Reported by Brodie (1995)

AUTHORITY	COMMENTS
Shire and Municipal Councils (40 in total)	- some Councils are very keen to be involved in any new management strategies for these corridors, but less so for the more remote Councils - all Councils were extremely interested and appreciated the opportunity to put forward their views for the continuing management of the railway corridors
State Rail Authority of NSW	- provision of track and structure information
Rural Lands Protection Board	- obvious that in a number of instances traveling stock routes ran parallel with the rail reserve - appropriateness of extending these stock routes across the railway corridor, thereby devolving the management from State Rail in those locations - Rural Lands Protection Board had embraced this opportunity with great enthusiasm and has proceeded to contact the local Boards for their comment and recommendations approaches have been received from the Glen Innes, Nyngan, Tenterfield, Hay, Urana, Bourke, Moree, Bombala and Holbrook Boards - it was anticipated that interest from other Boards will be forthcoming
Landcare	- as a result of this action, four Landcare groups have expressed interest in taking control of sections of appropriate corridors
National Parks & Wildlife Service of NSW	- Service believes that rail reserves are significant because they often traverse lands which have been used extensively for agriculture - they represent some of the only places where native vegetation which once covered the area, now exists. The Service had in fact made a submission
Greening Australia	- keen to see disused rail corridors being managed in an environmentally friendly manner - they would become involved when Landcare groups or local Councils took control of some of the corridors and then in turn instigated plans for regenerating bushland along those corridors
Australian Rails to Trails	- success of recreational tracks is very dependent on population distribution and Government policy - conversion of corridors in Victoria is likely to be more successful than in New South Wales because of its population distribution and available scenery close to Melbourne, and the Victorian Government's policy of removing track infrastructure after a line is declared disused. - Professor Marsh suggested at a recent seminar held in Sydney, that recreational trails must be planned in a regional context and must integrate with local tourism agencies. He also suggested that 50% of trail groups fail because the leader disappears and the group "stumbles". - in New South Wales, only two of the disused lines studied in the Brodie report stand out as possible candidates for recreational tracks: Humula - Tumbarumba and Lue - Mudgee.
Individual landowners	- would not pay for a lease simply because they have taken the responsibility over the years of keeping the corridor free from weeds and feral animals - 50% of New South Wales rural landholders belong to Landcare groups and as a result they are very keen to seek new initiatives in managing their land - opportunity of being able to plant trees along disused corridors in an attempt to reinstate tree growth and to provide windbreaks for cultivated land, which is extremely important

Source: adapted with minor edits from Brodie (1995)

4 RAIL-TRAILS: THE CURRENT SITUATION

4.1 Overseas Experience of Rail-Trails

The Rail-Trails Trend
Rail-trails have been constructed in many countries since the end of the 19th Century. Many of these have been developed informally. However it has only been in more recent times that two factors have coincided to spur interest in rail-trails:

- a greater number of railways have been abandoned - primarily due to the dominance of road transport and changing industrial and urban structures
- the rise of the environmental movement with development of trails as alternative transport corridors, and establishment of a rail-trail "ethic".

The key players are generally the developed nations - they have the largest extent of industrial railway, have made the greatest switch to road transport, and now have a population with leisure time and mobility to undertake recreation. The increase in transport (especially by road) now means that the roads are congested enough for cycleway alternatives to become popular and of interest to transport planners.

There are now international conferences on rail-trails, with the 1st International Rail-Trail conference held 15-18 November 1995 at Clearwater, Florida in the US. As reported in the Summer 95/96 edition of the *Australian Rails to Trails Newsletter*, discussion on rail-trail development was heard from Canada, England, Belgium, France, Germany, Austria, Spain and the United States. Great Britain and the US are the countries which have the greatest development of rail-trails and detailed literature is available on their experience.

Great Britain
Sustrans is the major force behind the conversion of disused rail lines to community pathways in Britain. As stated in the 1992-3 Sustrans annual report:

> *"exasperated by the lack of local authority provision for cyclists and walkers, volunteers organised by Cyclebag in Bristol in 1978 set to work to build a traffic free path on the disused railway from Bath to Bitton. This was the beginning of what was to become a nation-wide programme of construction under the auspices of Sustrans" (Sustrans 1994).*

Sustrans was later commissioned by the Department of Transport to investigate potential cycle routes, and produced a report titled "*Study of Disused Railways in England and Wales: Potential Cycle Routes* (DoT, 1982). This report, and a further report for Scottish routes, set the framework for over 2,000 miles of potential traffic-free routes.

Sustrans, which stands for "sustainable transport" is a practical charity, designing and building traffic-free routes for cyclists, walkers and disabled people all over Britain. Often these are on old railway lines, canal towpaths or unused spaces. Sustrans concentrates on major towns and cities, linking them with the countryside, and providing for commuter

travel, cycling to schools and family use. Routes exist or are in progress throughout the UK, and Sustrans have in place or scheduled some 40 routes covering a total of 300 km. According to Scotland (1996), by 1994 a critical mass of (rail-trail) paths in various parts of Britain had been opened. A map showing routes completed to the end-1993 is shown below.

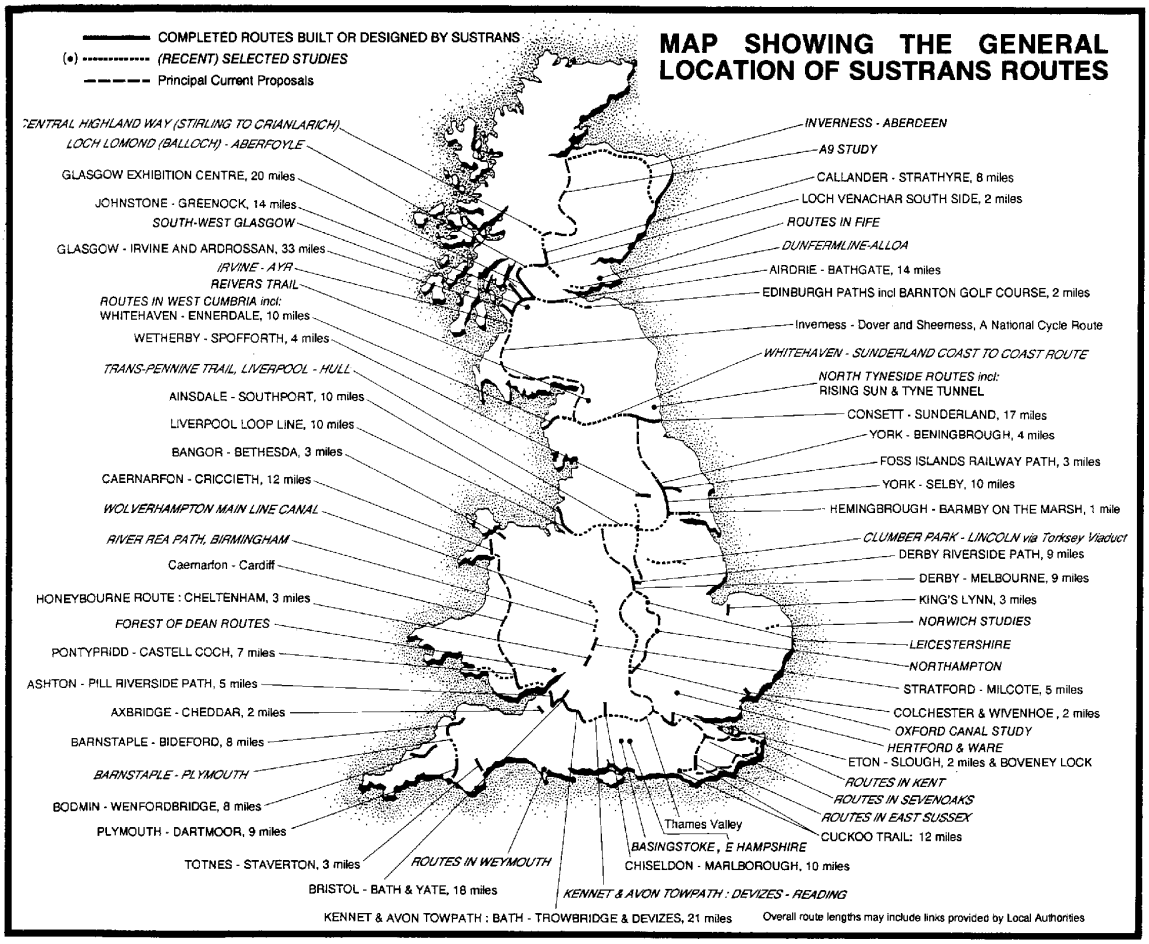

Figure 1- *Sustrans routes to 1993 (source: Sustrans, 1993)*

Sustrans' staff of engineers and designers contribute to the transport system by building a traffic-free network for the many people who choose to cycle or walk for their shorter journeys, as long as the conditions are safe and attractive. Volunteers are an essential part of its operations, helping to keep costs down and making paths viable. According to Sustrans, local people have invaluable local knowledge and continue to maintain paths once constructed. Summer holiday work camps are organised to construct routes. Sustrans has forged positive partnerships with local councils and now is being called on by local authorities to investigate new proposals. Sustrans also has formed a partnership with a wide range of environmental and transport groups.

Sustrans has as an objective the creation of at least one high-quality route through each urban area in Britain, using the "green threads" of space offered by rivers, canals or disused railways. The routes are appreciated as outdoor art galleries and pleasant landscape for

travellers, and have won awards for art in public places (Sustrans, 1993). An example of such artwork is shown below.

← *'Bedrock', the Airdrie to Bathgate rail pathway, UK. Source: DoT (1982)*

In respect of funding, Sustrans has recently been awarded a STG47 million grant from the Millennium National Lottery Fund. This will enable the completion of a 2,000-mile network of cycle paths through the whole of Great Britain by the year 2000, and a further 3,000 miles by the year 2004. Sustrans also asks for donations from the public, and currently has 22,000 members who raise STG2 million a year. In 1992-3 Sustrans turned to the general public for financial help, creating an Initiation Fund to raise money for the advance survey, negotiation and design work on new routes. The group estimates that initiation can cost up to 20% of the final project cost, and must be carried out to establish the viability of the route before statutory sources can be approached. Sustrans has nearly 100 projects in the initiation phase at any one time. Other sources of funds are Local Authority budgets, other public funds (such as derelict land grants, European funds and countryside funds) and fund-raising. The UK Department of Transport covers the cost of trunk road crossings.

Sustrans indicate that any particular project may take five years or more to investigate or develop. A good route needs to be at least 8 miles (13km) long and will require a total expenditure of at least a STG250,000 (approx. AUD$600,000). The path-building steps are:

- **Initiation phase:** with site visits followed by negotiation with landowners. Outline survey with route potentially being pieced together through a combination of land purchase, licenses, leases and other agreements. Most routes require 10 or more agreements. Public meetings to encourage local support and discuss detail. Points of entry to the path require a great deal of attention.
- **Full route survey:** in partnership with the local authority before full planning application is made.
- **Construction:** attention to detail is essential as people are moving slowly and seats are placed for people to sit and watch over paths, adding to safety. Sculpture adds to pleasantness. Along railway routes precise alignment of the path needs to be varied to give the most interesting views, and landscaping arranged so as to create a scenic route.

Local materials are used wherever possible and wet areas for wildlife are encouraged. Each mile of urban route may require as many as 8 to 10 access ramps at a maximum 1:20 gradient.

- **Funding:** shared between numerous bodies. Payment may be spread over three to four years during construction. Costs are quoted by Sustrans at about 30,000 to STG50,000 per mile ($40-60,000 per km). Construction is cost-effective using volunteers, prisoners (including those on probation or under community service orders), and/or Sustrans staff.
- **Maintenance:** Sustrans owns or leases the land and relies on local community groups to maintain paths. Many have a part-time ranger. Survey and maintenance is best done by staff who cycle, which reduces wear and tear from motor vehicles. Sustrans adopt the view that no path is ever finished!

Sustrans has designed and promoted the National Cycle Network and supports local authorities in the implementation of the network. Other activities include Safe Routes to Schools and Pathways to Health (Sustrans 1996). Railway, canal, river and special paths make up 32% of the national route, with on-road routes making up the rest. The 6,500 mile (10,000km) network, which is intended to pass through the middle of most major towns and cities in UK, will be partly funded from the Millennium National Lottery Fund referred to above. The network is expected to be completed by 2005 and involves a partnership drawing together over 400 local authorities and other bodies. The project is supported by central Government and environmental, health, countryside, transport and tourist bodies.

Sustrans also produces maps (both national and for each path) and free information sheets.

United States

The United States has a history similar to the UK and Australia of major non-urban rail expansion in the latter half of the 19th century, followed by decline in the face of competition from cars, trucks and air travel in the latter half of this century. More than 160,000 miles of lines are now out of service: only 140,000 miles of active rail line remain, with plans to reduce the core system to 100,000 miles (Ryan, 1994).

The introduction of a “railbanking” statute in 1983 (an amendment to the National Trails System Act) directed the Interstate Commerce Commission (ICC) to respond to direct requests from trail-managing agencies to “railbank” about-to-be-abandoned lines. This had the effect of allowing corridors to be preserved for future rail use while being used as trails in the interim, preventing abandonment and piecemeal disposal from taking place (RTC, 1996). It should be noted that, unlike in Australia, all US rail systems and corridors are often privately owned, with each corridor consisting of many separate land parcels owned outright by the railroad (railway) company.

Like Sustrans the Rail-to-Trails Conservancy (RTC) is the prime mover for conversion of disused corridors to trails in the United States. It has taken on the role of champion of rail-trails. Established in 1985, RTC is a national non-profit charity with over 50,000 members and a staff of over 40 people. Each year, 90 million people make use of the USA’s 821 rail-trails totalling over 8,200 miles (13,000km). However, this is in a country where there is a

population base of over 250 million. Thus about 1 in 3 US residents uses a rail-trail each year.

The RTC has a two-tiered strategy of national advocacy and direct project assistance. RTC's mission is to enhance American communities and countryside by converting thousands of miles of otherwise abandoned rail corridors into a nation-wide network of public trails. The vision is seen as being:

> *"..a vast network of trails across the nation connecting the city centres and rural landscapes and countless communities to each other...linking neighbourhoods to workplaces and congested areas to open spaces....serving both transportation needs and the demand for close-to-home recreation" (Ryan, 1994)*

One of the organisation's strengths is the quality of its publications and information base. RTC has compiled a database of trails information for all of their trails and considers this to be a very useful and valuable resource (Clarke, 1996). Affiliated organisations in each state provide information through newsletters, and many have Internet Web sites where maps, photos and updated information on the trails are presented. An example of fact sheet on the RTC is shown as **Appendix 4**. Key RTC publications which were obtained for this study and are referenced elsewhere in this report, and which provide sound advice and information include:

- *"Secrets of Successful Rail-trails - an Acquisition and Organising Manual for Converting Rails into Trails"* (edited by Karen-Lee Ryan and Julie A. Winterich, RTC 1993 in co-operation with the National Park Service, 1993, 178 pages)

- *"Trails for the Twenty-First Century - Planning Design and Management of Multi-use trails"* (Edited by Karen-Lee Ryan, RTC 1993, 213 pages)

- *"700 Great Rail-Trails"* (Edited by Karen-Lee Ryan, RTC 1993, 213 pages)

- "*Rails with Trails - Sharing Corridors for Transportation and Recreation"* (Patrick Kraich, RTC in co-operation with the National Park Service, 1996, 32 pages)

New Zealand

New Zealand's best known rail-trail is the Otago Central Rail-trail (OCR) located inland from Dunedin on the South Island. When completed in 1997, the trail will be about 150km long. Up to 1996, 85km of the route had been completed. New Zealand Rail (NZR) faced similar problems to those experienced by Australian rail authorities in deciding what to do with its disused rail corridors. It was keen to dispose of the OCR by vesting ownership in the Department of Conservation (DOC). The DOC undertook a feasibility study to determine the options for use. After receiving strong support from local communities and tourist operators it concluded that the corridor should be taken over and developed as a multi-use trail (DOC, 1993).

A major task influencing the progress of work and funding requirements was the repair of bridges. For instance the repair of the 96m Waipiata Bridge was made possible through use

of part of a $100,000 grant. The last major structure on the OCR, the Manuherita No.1 bridge, cannot be rebuilt until further funding is found.

4.2 Rail-Trails in Australia

All States in Australia have experienced a substantial decline in rail usage, particularly since the 1950s, with the rapid development of road transport for both people and freight. Many rail corridors have been leased to land owners for grazing. Rail authorities are examining ways in which this land can be put to better use and their management responsibilities and liability reduced. Converting disused corridors to rail-trails has been identified as a way of maintaining public access to and ownership of land while providing recreation and conservation opportunities.

A review of rail-trail status in the various Australian states was undertaken through literature review and consultation. The review highlights contrasting approaches to trail development and administration which have been adopted between the states. In South Australia and Western Australia the approach is "top down", with the relevant Departments of Recreation, Sport and Racing playing important roles in identifying and developing trails, while the Victorian approach has been to encourage local involvement and advocacy with state government agency support mainly through provision of information and expert advice.

In 1993, the Australian Rails to Trails Society was formed to promote and support local rails-to-trails groups with the objective of establishing a wide network of paths and linear nature reserves.

Most of the Australian States, including NSW, have examples of rails-with-trails commuting cycleways running alongside or within an active rail corridor. In Melbourne and Perth these routes have been either formally investigated or provided by the transport authorities, whilst in NSW many formal or informal pathways and cycleways exist alongside active rail corridors. These are discussed in section 4.2.5 below.

4.2.1 Victoria

Rail transport grew quickly in the 19th century as extensive rail networks were developed throughout Victoria. With the decline of rail transport in the last 50 years there are now over 60 closed lines in the state. Rails and infrastructure have been removed from most of these lines.

In Victoria, when a railway line has been declared disused, track and infrastructure have immediately been removed by the Public Transport Commission (PTC). A decision is made as to whether the line has any further use as a railway or whether it has use as a conservation / recreation corridor. If the line is felt to have value for conservation/recreation, the land is vested in the Department of Conservation and Natural Resources (DCNR), which undertakes management in conjunction with a local committee.

According to their own words, "*the Victorian State Government is setting the pace in Australia with its Rail-trails program"* (DCNR, 1994b). Rail-trails have received government and political support, As reported in the Australian Rails to Trails Autumn 1996 Newsletter, the Victorian Coalition party promised $700,000 towards creation of rail-trails in Victoria to be spent in its next term as part of the development of innovative projects, and a Parliamentary Committee has recently been established. The Victorian rail-trails program is also strongly supported by the Victorian State Bicycle Committee through its regional forums. The opportunity to convert disused lines is perceived as very exciting. It will complement the regional bicycle network, and provide access to towns with consequent increases in tourism (Nathan, 1996).

So far in Victoria 18 rail-trails have been established along disused corridors. Opportunities exist for rail-trails on a further 65 lines. The first and most successful example in Victoria for a rail-to-trail conversion is the Lilydale to Warburton trail. Details of this successful rail-trail are presented in the box below.

Lilydale to Warburton Rail-Trail
Rail operations on the 38km line ceased in 1965. As bridges deteriorated attempts were made to sell of the land, but local residents saw the recreation potential of the track and opposed the sale. Work on constructing the rail-trail commenced in 1993, with the first stage of 10km opened in 1995. The multi-use trail has visitation of over 3,000 per week, mainly by those living in the nearby Yarra Valley. The trailhead is accessible by the suburban rail network at Lilydale..

According to the promotional literature for the trail...."*The trail takes city people straight into bushland, through tall timbered areas and then into open grazing country with beautiful mountain vistas. It follows the lush Yarra River flood plain to the foot of the rugged Central Highland mountain ranges." (Lilydale-Warburton Trail Committee)*

The trail is managed by the Warburton Trail Committee which includes Yarra Ranges Council and local community representatives.

To assist the local management committees in developing and managing rail-trails, DCNR have prepared a rail-trails 'kit'. This kit is sent out to prospective rail-trail committees at the outset, and includes guidelines for setting up and managing the committees, funding sources and construction and management advice.

In metropolitan areas, the Public Transport Commission (PTC) have co-operated with the local government in the construction of a number of rails-with-trails facilities. Some sections of these cycleways are located within the active corridor of the suburban electric rail system. One such Melbourne trail, where the 'Capital City Trail' passes an inner city railway station, a squeeze point means that the cycleway narrows to just 1.5m wide, and is less than 3m from the outside running rail. This cycleway is separated from the active rail lines by a simple pine log barrier. However, these are no longer used due to maintenance problems. Chain wire fencing is generally used instead. The land over which the cycleway operates is managed by the local council, under license to the PTC. The license agreement sets out maintenance and liability requirements.

4.2.2 South Australia

According to the Australian Rails to Trails (ART), South Australia has the two longest rail-trails in Australia, the old Ghan line from Maree to Alice Springs and the track parallel to the Transcontinental line from Port Augusta to Kalgoorlie (ART 1995). The new standard gauge line from Melbourne to Adelaide has isolated several lines which are now disused. There are over 30 disused lines in South Australia, with tourist railways in operation over four of these (ART, 1995)

A network of rail-trails is being created in the Clare and Gilbert Valley region with the completion of the 80km Riesling Trail. An initiative of the Outdoor Recreation Unit of SA Office for Recreation, Sport and Racing, the trail will connect to the Heyson (walking) and Mawson (MTB) trails. Emphasis is being placed on developing trails in existing tourist areas, such as the Barossa Valley and Adelaide Hills.

The 34km Willunga Trail linking the southern suburbs of Adelaide with the CBD is currently under development. When complete, it is proposed that the trail will follow both disused and active line sections. Local councils in the area have formed a working party to oversee development of the trail. It is interesting to note that developers of a housing project straddling the trail have recognised the trail as a positive marketing point (Australian Rails to Trails, 1996a).

4.2.3 Western Australia

Rails-to-Trails

In common with the Eastern States, Western Australia has an extensive network of disused railway lines.

Western Australia's first rail-trail was developed by Mundaring Shire in the 1970s. Little further interest was shown in disused rail lines until the late 1980s when the Department of Conservation and Land Management (CALM) raised the issue in a regional tourism study. The Roadside Conservation Committee was responsible for maintaining an awareness of rail reserves. Westrail has classified its disused lines according to short-, medium- and long-term needs and wishes to maintain ownership of all corridors for possible future rail use.

Recognition of the potential of rails-to-trails was heightened when the South West Development Commission sponsored a conference in 1994. It was established that a number of local shires were looking at trails in their areas. Westrail was looking at uses for their disused lines and CALM was developing its own proposals such as the Margaret River to Cowaramup rail-trail built in conjunction with the Margaret River Council.

In 1995 the Department of Sport and Recreation set up a task force to examine the development of rail-trails. Among its recommendations were that a body called Trailswest be established to co-ordinate and support the development of a network of trails. The Western Australian Government has just recently announced that it will proceed with Trailswest implementation, through an $800,000 funding package over the four year period 1997-2001, and appointment of a full-time executive officer (WA Sport & Rec., 1997).

Rails-with-Trails: the Perth Veloway Network

Western Australia is also moving to establish rails-with-trails. Recommendation No.25 from the WA Ministerial Task Force on Traffic Calming called on Main Roads WA to build a network of high quality cycling freeways (or "veloways") with a minimum design speed of 50km/h on rail reserve land in the Perth metro area by year 2005. Land was to be donated by Westrail or leased at a peppercorn rental (Waugh, 1996). A typical section through a veloway corridor is shown in Figure 2 below.

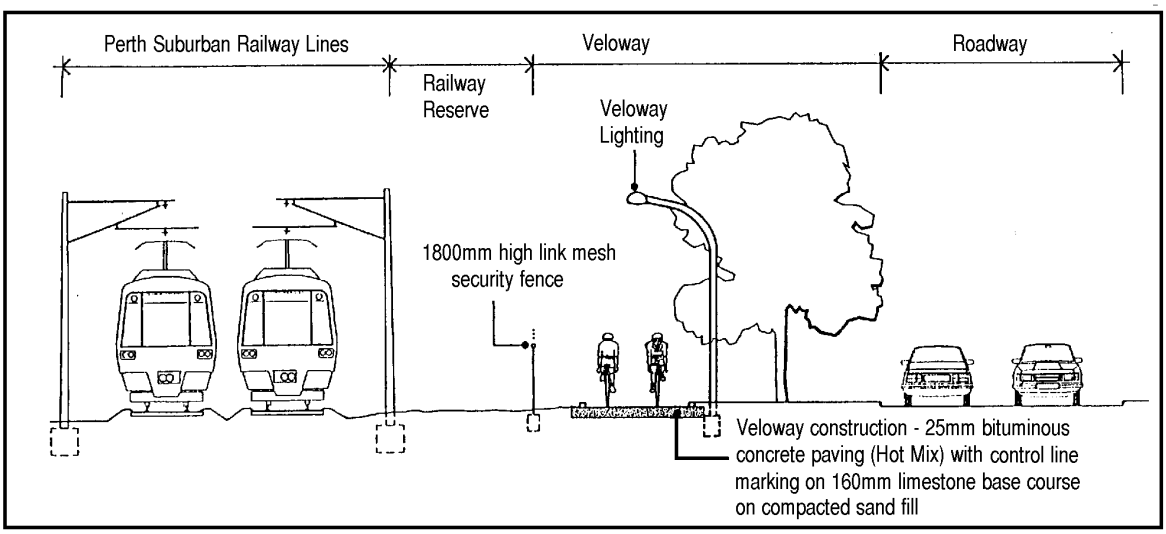

Figure 2 *- Section of typical veloway corridor* Source: McKenna Priest Shaw (1996)

It is understood that work is scheduled to begin soon on the first veloway section between the inner-suburban stations of Claremont and Swanbourne.

4.2.4 Tasmania

As reported by Mark Plummer in the Australian Rails to Trails newsletter, "*opportunities in Tasmania for rail-trails are significantly different to those of the mainland states...there is not as extensive a network of abandoned rail lines, but there are opportunities of building alongside existing railways*" (Plummer, 1996). An example of this is the fully sealed shared cycleway which follows the rail corridor from Devenport to Don junction for seven kilometres, then the Tourist railway to Forth. Plummer believes there is an opportunity to construct long distance cycleways along the major active rail corridors, so as to provide an off-road link to the larger towns.

According to a map produced in the ART Newsletter (ART, 1996b), there are over 20 disused railways in Tasmania. There are many more than this being timber railways (or tramways) and private lines once servicing mining operations. Most of these are overgrown, unmarked and in some cases on private property, with only a few kilometres being well maintained for cyclist use. Forestry Tasmania has built a few rail-trails along old timber railways, both on Tasmania and the offshore islands.

4.2.5 New South Wales

NSW Railway Network and Services

Since the first railway was established from Sydney to Granville in 1885, over 10,000km of Standard gauge (1.43m or 4^{ft} 8 and a quarter inch) railway line has been opened. Information prepared by the SRA indicates that of this total, some 2,800km of line has become disused. In addition to the government operated lines there have been many private lines operated and subsequently abandoned. However, these are outside the scope of this study. The layout of the NSW railway network and the location of disused lines is shown in **Figure 3** below.

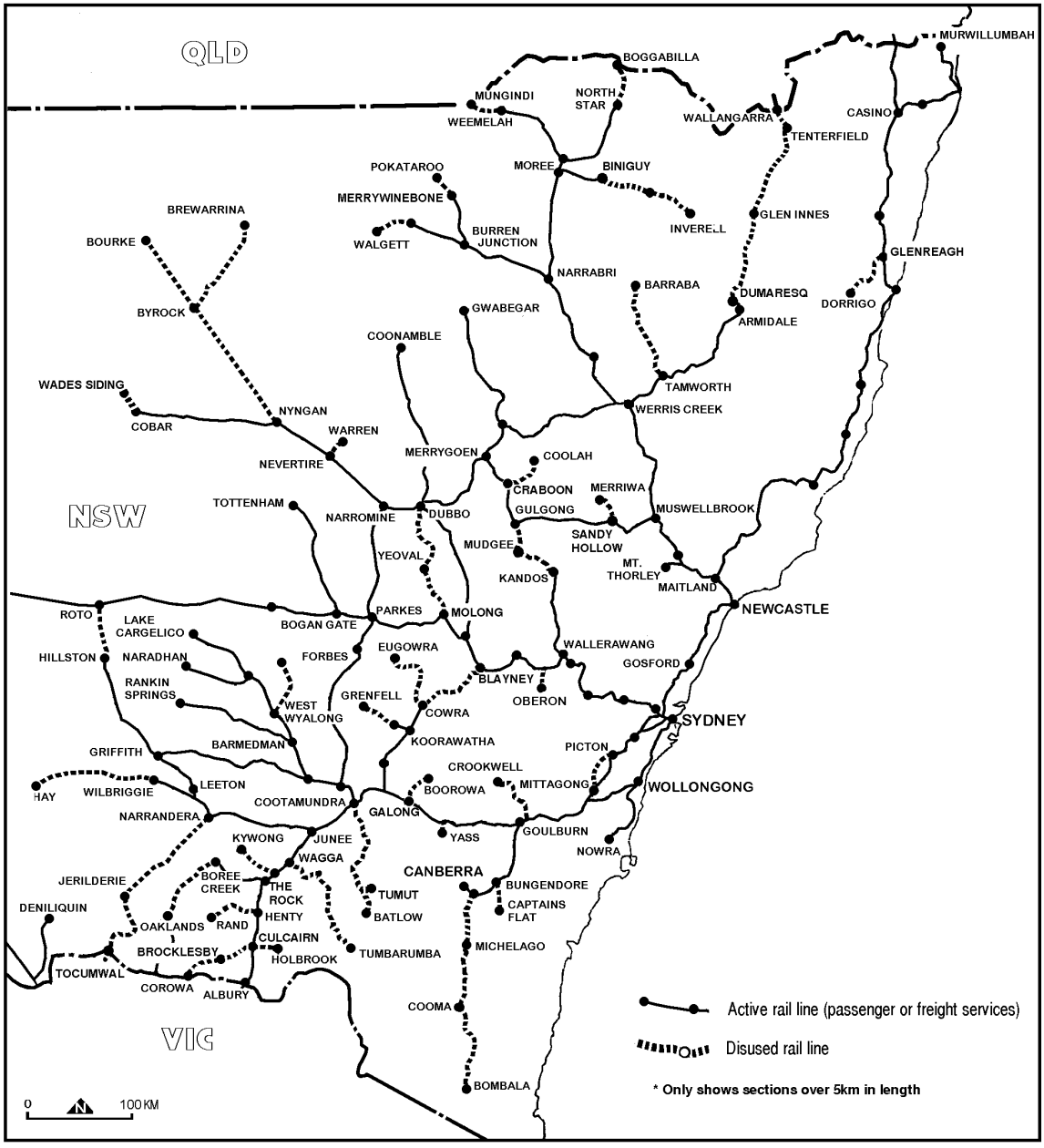

***Figure 3** - NSW Railway Network Showing Location of Disused Lines*
Source: from a map originally prepared by ART 1995, with additional information.

Both passenger and freight rail services are operated over the 7,385km of active rail line in NSW. CityRail operates passenger commuter train services over the electrified network in the greater metropolitan region and extending to outer lying regional centres. Countrylink services the rural centres, with XPT and express rail services to the North Coast, Dubbo to the West, and South to Albury. Coaches connect towns and rural centres on the rail network no longer served by trains. FreightCorp operates freight services over the majority of the network in addition to dedicated freight lines in the metropolitan area.

Rails-with-Trails

Most of the Australian states, including NSW, have examples of commuting cycleways running alongside or within the rail corridor. In Melbourne and Perth these opportunities have been formally investigated and approved by the authorities, whilst in NSW many formal or informal pathways and cycleways exist alongside rail corridors. Although not formally documented there are a number of rails-with-trails in NSW.

Examples of rails-with-trails range from short lengths of footpaths, which happen to lie close to or alongside the rail corridor, to trails specifically designed to share the active rail corridor. The latter generally require specific lease or license arrangements. There are also many informal tracks within rail corridors, formed by the passage of pedestrians and cyclists over time, using (perhaps illegally) the corridor as a more direct route, or in some cases the only feasible route, to the local station or shops. A list of such informal rails-with-trails has been compiled by RSA and is reproduced as **Appendix 5.**

Specific examples of documented rails-with-trails implemented in NSW include the Como, Sydney Harbour Bridge and Ryde to Botany Bay Cycleways. Refer to the box for details.

← *Como cycleway in Sydney's south which crosses the Georges River using the disused single track lattice girder railway bridge. For a portion of its length the the facility shares rail maintenance access with the Illawarra Line*

Photo: from SKM (1996)

Examples of rails-with-trails in NSW

Como cycleway - connecting Oatley and Como across the George's River was opened in 1988. The 1km route makes use of a section of the active rail corridor (Illawarra Line), and crosses the river using the restored former railway bridge. The first 500m from Oatley consists a 2.5m wide asphalt cycleway, separated from the active lines by a 1.8m high chain link fence. A number of locked gates along this section of the cycleway provide access for railway maintenance vehicles which use the cycleway. The minimum distance to the active line is approximately 5m. The cycleway appears to be very heavily used by cyclists, walkers, joggers, rollerbladers, etc. especially on weekends. However, no accurate use data is available.

Sydney Harbour Bridge cycleway - This facility although technically outside the rail corridor closely follows the active rail line. The cycleway has been in place since the early 1980's when the western side of the bridge was dedicated as a cycleway primarily as a result of lobbying by cyclists. Apart from signage the facility is identical to the pedestrian walkway on the eastern side. The 2.5m wide cycleway is separated from the active railway by a 1.2m high cast iron lattice barricade topped by a steel railing. It is probably the most well used cycleway in Sydney, however no cyclists use data is available. It is interesting to note that a barbed wire fence has been placed on the outside of the cycleway, presumably to deter suicide attempts. The cycleway is less than 2.0m from the outside running rail of the electrified line. Inquiries made with the Transport Safety Bureau, CityRail and RTA indicate that there have been no reported or recorded incidents of cyclists injury or accident as a result of the cycleway proximity to the rail line.

Rhodes - The Ryde to Botany Bay Cycleway includes a rail-with-trail within the west (down) side of the Main Northern Line corridor between Rhodes station and Homebush Drive . This section is a critical link in the 30km of cycleway. The cycleway is on land believed to be leased to Concord Council. However, documentation on the exact nature of ownership is poor. The 2m wide cycleway is located between the 1.8m high railway fence and a private property boundary. The cycleway is about 6m from the tracks at its closest point.

It is understood that a rail-with-trail is proposed to be constructed alongside the Main Northern Line at Grafton. The works, if approved would formalise the pedestrian and cyclist access from the southern end of the Macleay River bridge to Grafton station. This will improve current arrangements which have encouraged pedestrians to cross the tracks illegally as a short-cut. At its closest point the pathway will be less than 2m from the nearest running rail and separated by a 1.8m high chain-link fence.

As shown in **Appendix 5** there is also evidence of informal pathways within the rail corridor. For example the service track is often used by pedestrians and cyclists (illegally) to provide more direct access. It is difficult to identify whether this practise has ever resulted in any incidence of injury or accident – fatalities involving people straying onto railway lines are recorded as "trespassers" even though many, and probably most, are suicides.

Rails-to-Trails

As at October 1996, there were 44 disused or mothballed railways in NSW, with title to most of these passing to the RAC in July 1996. A small number of these lines are being used by heritage groups under Disused Line Deeds or Access Agreements (see Section 4.3 Existing Statutory and Structural Arrangements). According to Griffin (1996), most of the railways which are now classified by the RAC as disused became that way simply because traffic levels dropped to uneconomic levels. There has been no formal process to declare a railway as disused.

There have been a number of reports into disused rail corridors in NSW in recent years.

In 1994 State Rail commissioned Brodie and Associates to prepare a detailed account of 25 disused railway corridors in NSW. The report looked mainly at maintenance and liability, and potential adaptive re-use for the corridors. Key points to arise from this work in relation to the current study are:

- many sections were constructed around hillsides, run parallel with the main road and along watercourses. This is an important factor to note with regards to the future re-use of the corridor as, for example, walking tracks and travelling stock routes.
- overall, the track infrastructure is in poor condition and many washaways have occurred, particularly in the north west of New South Wales. Bridges, being of timber construction in the main, are of major concern. In many instances their abutments and wing walls have collapsed. There appears to be a real problem with the infestation of disused rail corridors by various noxious weeds around the whole of the State.
- on some corridors, sections of track infrastructure have been removed, either by theft or by arrangement with various divisions of SRA. At many level crossings lines have been cut, with the road proceeding across the corridor at grade. Much of the track has been lifted on the line being declared closed or relocated. Station yard infrastructure such as water tanks, turntables, jib cranes, gang sheds and goods sheds have been left onsite .
- of eleven station buildings leased to third parties, three remain vacant and have been left unmaintained. These are at Lue (Kandos - Gulgong line), Gundagai (Cootamundra - Gilmore line) and Bombala (Cooma - Bombala line).
- fencing on disused corridors classified as being "fenced" is often in poor condition. However, where fencing has been the responsibility of adjoining land owners and is required to stop livestock from grazing on the corridor, fences are generally in very good condition (Brodie, 1995).

A recommendation of Brodie following this study was that *"in more closely settled areas disused corridors could be readily converted to bush walking trails and bicycle tracks by interested groups for some of their distance"* (Brodie, 1995)

A review of the rail-trails situation in NSW by Longworth (1996) is reported in the Summer 1994/95 edition of the ART newsletter and is reproduced as **Appendix 5**. A summary of data and potential for use as a rail-trail was compiled by the then Freightrail in 1991 (Rails-to-trails, Freightrail, 1991). An unpublished draft document detailing procedures for conversion and management of disused corridors for rail-trails has been prepared by Donald

Ellesmore from the Heritage Section of the SRA (Ellesmore, 1996). This report is based primarily on information contained in the guidelines document prepared by DCNR (1994a).

Although there are many disused corridors in NSW, there are few instances of conversion, i.e. rails-to-trails. This is generally as a result of the legislation which prevents removal of the rail infrastructure. **Appendix 5** includes a list of known rail-trails. However, of the 20 or so trails identified the majority of conversions have been to construct roads for motorised traffic. Adopting the US terminology, the only rails-to-trails in NSW which have been constructed over the original formation are:

- Wellby to Box Vale near Mittagong (refer box below)
- Newnes Junction to Newnes
- Como Cycleway (as described above), and
- Waterfall to Stanwell Park Trail (Otford deviation)

BOX VALE TRAIL
The conversion of disused railways to trails is not a new phenomenon in NSW. One of the oldest rails-to-trails in the world is believed to be the Box Vale trail near Mittagong. The Box Vale oil shale mine railway was closed in 1896 with the infrastructure removed at that time. It is understood the formation had been used as a walking trail informally over the years, however, it was not specifically constructed as a public walking trail until the mid 1980s by the then Department of Lands. There are other such examples from the past, some well known and others more obscure.

Of these the closest equivalent to the US and UK examples of rail-to-trails is the Newnes Junction to Newnes Trail. Other disused rail lines have been converted to other land uses, or taken over as public roads. The Greenway-1 cycleway referred to earlier, is the most recent and successful example in NSW of a trail being constructed within a disused rail corridor. This facility is not strictly a rail-to-trail as the concrete cycleway has been constructed alongside the rail formation and it is proposed that a museum railway operate at low speed over the disused line. (refer also to the box in Section 5.2.3)

Tourist and Heritage Railways
Many of the disused lines in NSW are leased to tourist railways, museum railways or train enthusiasts. However there is a varying degree of success in operating tourist railways. A listing of those train enthusiast organisation holding leases over the corridors and the extent of use is summarised below in **Table 3.**

As shown in the table there is a wide variety of museum and tourist trains operations along corridors which have been closed or services ceased. These range from the well organised Zig Zag, TRM and ARHS operations to the individual train enthusiast. Individuals typically lease the corridor for a peppercorn rental. Most of the successfull operations rely on significant government subsidies and grants or services and material in kind. Any operator must comply with provisions of the Rail Safety Act regarding accreditation and safe working practices.

Table 3 - Current and Potential Museum & Tourist Train Operators

Disused Corridor & Current Status	Comments / Queries
Picton -Mittagong Currently leased to Thirlmere Railway Museum (TRM) for Picton to Buxton section	TRM operate once a week advertised tourist steam train: Thirlmere to Buxton, and occasional trains from Sydney to Buxton. They propose to extend services to Hill Top, and eventually to Colo Vale. Once a year there is an event in which trains are raced against bikes from Buxton to Thirlmere
Goulburn - Crookwell Leased to a tourist train organisation	
Bungendore-Captains Flat Leased to train enthusiast. for private railway	
Queanbeyan-Michelago Leased to ARHS trading as Michelago Tourist Railway from Queanbeyan to Michelago.	Operate line from Queanbeyan to Michelago. Regular and well patronised advertised tourist train once per month and special trains, and special occasions. Services suspended during 1995-6 to allow repair of bridges
Bredbo-Cooma Proposal submitted by train enthusiasts for lease	Intention to run museum train/rail motor Bredbo to Cooma
Yass Junction-Yass Town Lease to Railway Museum	Have initiated the Yass Railway Museum, with intention to run museum trains
Gilmore-Batlow Currently lease negotiations underway	Museum trains ran by Mountain High Railway 1988 to 1990 then services withdrawn and went into voluntary liquidation. Proposal to reinstate museum trains under different operator are current - no maintenance on line undertaken since approximately 1990
Wagga Wagga-Ladysmith Group intend to apply for lease (formed 1995)	Intention to run museum trains to Ladysmith and eventually to Tarcutta
Blayney-Cowra Currently leased to Lachlan Valley Tourist Railway	Operate infrequent museum train Blayney to Cowra and occasionally to Eugowra.
Rylstone -Gulgong Group intend to apply for lease	Proposal to restore services using museum or light rolling stock.
Dumaresq-Tenterfield Glenn Innes and Northern Tablelands Tourist Railway formed with intention to lease corridor	Proposed museum trains/re-activation by private operator

4.3 Existing Statutory & Structural Arrangements

4.3.1 Legislative and Statutory Background for Rail Corridors in NSW

Legislation covering ownership, operation and management of NSW rail corridors includes:

The Transport Administration Act 1988 No. 109 (as amended)
Recently the Transport Administration Act was amended to restructure the SRA into four corporate organisations. Whereas previously the SRA reported to the Minister for Transport, the two new corporations (Rail Access Corporation and FreightCorp) report to their respective Boards and shareholders (represented by the Premier and Treasurer). The new State Rail Authority and the Rail Services Authority still report to the Minister.

Under provisions of Section 92 of the Act, the RAC is not required to maintain a railway line on which no services are operated. This is the case for the dozens of disused lines around the State. In a report to State Rail, Griffin (1996) suggested modifications to the controlling legislation to make RAC's disused lines situation more manageable. Under provisions of Section 93 of the Act, the SRA shall not, unless authorised by an Act of Parliament, close a railway line. For the purposes of this section, a railway line is closed if the land is sold or otherwise disposed of or the railway tracks and other works concerned are removed. Railway corridors are generally owned (fee simple) by the Crown.

Rail Safety Act 1993 No 50
The second major piece of legislation relevant to this study is the Rail Safety Act 1993. The object of the Act is to promote the safe construction, operation and maintenance of the railways through establishment of an accreditation scheme for owners and operators and certification of competency for railway employees. The Act also specifies safety inspections, reporting measures and inquiries into incidents. The Act is mainly used to safely manage the operation of private and museum railways.

The Rail Authorities Structure
The various roles and relationship of the new agencies and with the Department of Transport are summarised in **Figure 4** below.

The implications of the restructuring for rail-trails are:

- ownership of infrastructure (such as bridges) by RAC but ownership of land by SRA may complicate negotiations
- the corporations now have a focus on commercial return
- there are still some areas of the vesting which remain unresolved (such as ownership of road overbridges)
- enacting legislation to remove infrastructure now requires support among a number of agencies.

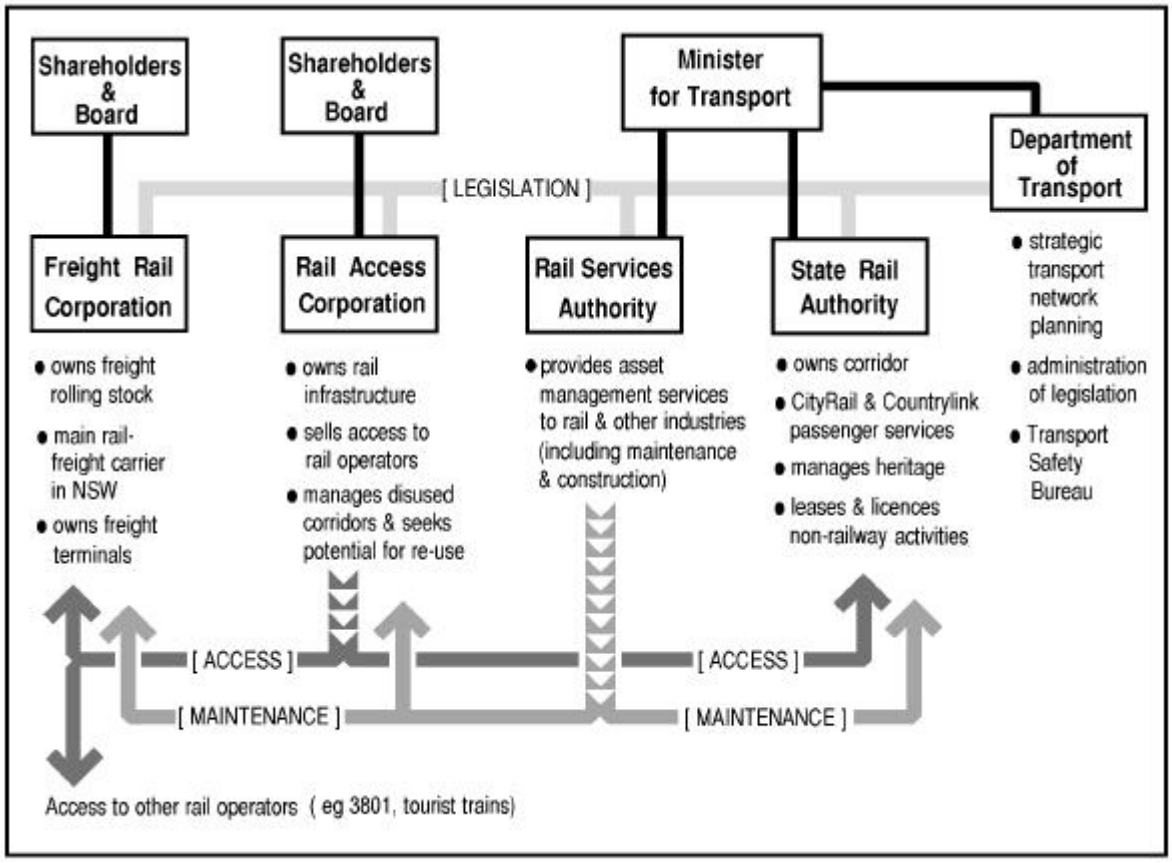

Figure 4 - *Roles and Relationships: Rail Authorities & DoT*

4.3.2 Other Agencies and Potential Roles

A key agency will be the RTA, the peak authority in NSW with responsibility for cyclists provision. The RTA wants especially to increase bicycle trips by providing facilities which cater for short-distance journeys (Faber and Wyatt, 1996). The RTA is currently developing strategic bike route plans for the GMR and sub-regional areas and major rural centres around the State. An inventory of bicycle networks for urban areas and rural towns has now been produced for comment (Arup, 1996). This has been produced in both mapping and spreadsheet format. A copy of a sample mapping for Dubbo is included as **Appendix 6**. According to the RTA, these plans could include cycleways along rail corridors to contribute to the network (RTA, 1996).

It is likely that the establishment and management of rail-trails will involve many government authorities. Potential areas of involvement for a range of authorities in addition to the roles for the rail authorities are shown in **Table 4.**

Table 4 - Potential Agency Involvement in Rail-Trails

Current Mission and Areas of Responsibility	**Potential Areas of Involvement**
Councils: Local bike routes construction, leasing of easements,	- as leaseholder, builder and manager of short strategic links along active lines - part funding of local routes in conjunction with RTA. Involvement in trails committees
DLWC: Trails management and advice, land management	- owner of disused corridors most suitable for trail conversion. Administer trail committees - title search, corridors information
DoT: Resp. for administering legislation and providing policy on bikes on trains, lockers at stations funding, integrated networks	- potential lead agency for establishing and managing any proposed 'Trails Council' - limited funding of interchange works
DUAP: Planning programs at local, regional scale	- integration with local and regional planning and improvements
Federal-various: Employment schemes, Transport, Tourism, Regional development, etc.	- funding through a number of agencies
NPWS: Trails construction and maintenance expertise	- advice re construction and planning, rehabilitation - involvement in trail committees where near National Parks.
Public Works: Design and construction of public structures.	- public architectural projects, design of key urban structures.
RTA: Cycleway planning and implementation, on-road cycle routes, funding of LGA and Regional facilities	- contribution towards funding of cycleways forming part of the bicycle network - review of planning and engineering guidelines for rail-trails
Sport & Recreation Sport and school holiday programs	- development of programs and activities involving rail-trails - development of programs for those with disabilities
Tourism NSW: Development and marketing of strategies, assistance	- develop rail-trail tourism packages to assist rural proposals

4.4 Comparing the Situation in NSW with Experiences Elsewhere

The experience of rail-trails Australia wide and overseas can be assessed against the situation in NSW. Comparisons between all these locations are discussed below.

Community Support: A common theme amongst all of the countries is a community desire for traffic-free recreation and commuting links. This, and the ability of the rail-trails to cater for a wide cross-section of the community has resulted in generally very high levels of community support. The rail-trail organisations in the US and UK are well funded, well organised and have made substantial progress.

The 'Australian Rails to Trails' organisation has been referred to earlier, and is gaining momentum. Australia and NSW have a similar history of use of volunteers in community projects, for example Landcare and similar groups. Compared with the other states, and considering the total length of disused line, NSW has the least experience of rail-trail development, with very few rails-to-trails facilities in place. There are however comparatively more examples of rails-with-trails.

Population and Rail Corridor Densities: There are higher population densities in urban and rural communities overseas where rail-trails facilities have been developed (particularly in the UK), than in NSW. For instance in the UK there are almost three times the length of disused rail corridor, in a country a quarter the size of NSW but with ten times the population (over 100 times the density of disused rail per head of population). NSW is also less densely settled than Victoria, where the region around Melbourne has many closely spaced rural towns. NSW rural areas have lower population densities and a sparser concentration of railway lines close to major population centres. The implications of this are that there is likely to be lower levels of regular use by the local population. Opportunities for funding, volunteer labour and support at the local level, especially for longer trail proposals, are also reduced.

Corridor Form: In the GMR, the rail corridor is more constrained and the terrain more difficult compared with Melbourne and Perth where veloways are proposed. Rail crossings in metro areas of NSW are generally grade separated whereas in Perth and Melbourne they are generally at grade. A crossing at-grade means that a cycleway can proceed along the corridor on a reasonably level grade rather than having to rise up and over each road crossing as is the case for most of the Sydney metro area.

Bridge Materials: a striking difference between the situation in Australia where there is widespread use of timber for trestle bridges, compared with the UK where most bridges are stone or brick thus requiring less maintenance. It is because of the deterioration of bridges and wash-aways that many of the rural lines in NSW were finally closed down.

Train Enthusiasts: In all the countries studied, railway preservation and train enthusiast groups have utilised disused lines. In the US there are examples of tourist trains and rail-trails sharing corridors. In the UK it is reported by Sustrans (1994) that there are thousands of such groups in the UK. As shown in Table 3, this is also the case in NSW. In NSW poorly resourced train enthusiast groups can lease lines for a nominal rental often with the line gradually deteriorating. An exception is the Dorrigo-Glenreagh railway, recently purchased for exclusive tourist train use. By contrast, in the US, these organisations are well funded and generally own the corridor outright.

Railway Abandonment and Removal of Infrastructure: In other locations, particularly Victoria and the UK, when corridors are abandoned, rails and other infrastructure are removed. The key legislative requirement in WA is that where a rail reserve is to be released, a Discontinuance Act must be promulgated. This differs from NSW in that in Western Australia infrastructure may be removed from a line without enacting legislation.

Ownership of Corridor: In the US, railway corridors are privately owned and the RTC has to buy the corridor outright. This means more funds are needed early in the process, but these can however be partially recovered later by salvage of rails and other infrastructure. Ownership of the corridor means the RTC has greater control. In the UK there can be a mixture of land parcels and ownership. For instance as reported by Sustrans, only 10% of disused lines are now in British Rail ownership, and 25% in other public ownership (DoT, 1982).

This is in contrast to NSW where almost all the disused corridors are owned in their entirety by government and generally rails and other infrastructure has not been removed. However, as reported by Brodie (1995), there are instances where rails and infrastructure have been removed in response to circumstances which arise from time to time. In Victoria disused corridors are vested in the Department of Conservation and Natural Resources following removal of infrastructure.

The Surrounding Environment: The landscape in NSW is generally flatter and less heavily forested than in Europe or the USA. Many of the disused lines in rural areas run through undulating cleared grazing land which is less scenic when compared with say the escarpment areas of NSW, the heavily forested areas of, say, the south west of WA or the north east of the USA. This has implications for the design of facilities and must be recognised when studying overseas trail design manuals.

Northern hemisphere countries generally have milder summers and more severe winters than in Australia. Although climate is not a major factor for most areas of NSW, disused lines in the tableland lines such as Glen Innes-Tenterfield and Cooma-Bombala experience snow and ice conditions which can hamper construction work. Hot and dry summer conditions for much of NSW can be unpleasant for cycling, particularly if there is an absence of shade and opportunities for obtaining drinking water.

Recreation Demand/Supply: Australia offers a high diversity of existing outdoor recreation opportunities (especially in natural areas) compared with the UK and thus there is a greater range of competing leisure time activities. The situation in NSW is fairly similar to the US.

Structural Arrangements within Rail Authorities: In Western Australia, Westrail's role changed significantly since deregulation and lines classified as "non-operational use to Westrail" became available for rail-trail conversion. As described earlier, Westrail has a priority classification system in place for disused lines, whereas in NSW, there is no formal classification of disused corridors.

The Trailswest report included a number of findings with regard to railway reserve ownership including suggesting the development of a procedure which could effectively secure selected reserves for trail purposes (for example vesting in a local authority). In 1991 a policy opposing the granting of freehold title over any portion of disused railway land was adopted. The Department of Land Administration (DOLA) now has a policy of annual renewable grazing leases which may be terminated on three months notice. A recent DOLA Divisional Minute suggests that no further offers of freehold tenure be made for areas forming part, or all, of disused railway reserves.

In Victoria where corridor ownership is vested to DCNR, control and responsibility is formally passed to incorporated COMs, operating under Departmental Guidelines (refer *Rail-trails - a guide for prospective committees of management* DCNR, 1994). For a similar process to occur in NSW, the Transport Administration Act would have to be amended.

5 ISSUES & CONSTRAINTS

5.1 Identifying Issues

By necessity, the study has provided general comment on a number of issues. Many proposals require specific solutions which may be at odds with the general observations contained below.

The brief to consultants outlined a number of specific issues to be considered and these are addressed below. In addition, there were a number of other significant issues which were raised either during consultation or were commonly encountered during the literature review process which are also considered. Issues have also been raised during rail-trail investigations such as the Trailswest investigations and the South West Trails Conference (SWTC). In NSW the various issues have been considered in unpublished reports such as those by Brodie (1995), and Ellesmore (1996).

5.2 Specific Issues Considered

5.2.1 Viability and Public Support

ISSUE: What issues have been considered in determining which facilities are viable, and how has public support been gauged?

This has been taken to mean "what issues have been considered when determining whether the particular proposal has merit and is worth the resources required to implement and maintain it?"

The issues considered, as in the case of most infrastructure projects, relate to:

- Construction – whether it is possible to construct a trail in an engineering sense
- Political – whether the proposal has the support of relevant institutions and community groups
- Financial – whether there is sufficient funding to construct and maintain the trail and whether the trail provides sufficient benefits to justify the estimated costs, given the alternative possible targets of expenditure.

These have not been systematically dealt with in previous studies of rail-trail proposals. For instance, for the WA Veloway project, Bikewest has not yet fully resolved the issue of viability. In particular, the merits of cycleways compared with other projects needing funding have not been fully assessed (Bikewest 1996). Bikewest have developed selection criteria for their Perth Bicycle Network, with priorities being considered at three levels:

- Basic principles are established for identifying projects and setting priorities
- Within each facility type (e.g. between each local bicycle route), priority is placed on facilities that do the most to encourage cycling and reduce the number and severity of crashes

- Between each facility type (e.g. regional bicycle route vs. greenway vs. local route), it is proposed to consider the top priorities for each type, rather than select one type over another - this gives priority to a range of facility types.

Gauging Public Support
Generally, once rail-trails are successfully introduced and established, they are perceived by the community as 'good news' items and wide community support is shown through positive media articles, responses from key stakeholders, and encouragement given to politicians. However, in the early stages, some proposals have met opposition, this having been flagged mainly through the media, or through public meetings. The press is often a key player in reporting and influencing public opinion, more so when there is adverse publicity and potential controversy than when there is a cross-section of support in the community. Monitoring of press during this study confirms that this is the case, particularly for local newspapers in rural centres.

One common method of gauging public support is to undertake a survey. This has been done for a number of rail-trails, including the Margaret River - Cowarumup trail in WA, where the Western Australian Tourist Commission undertook a resident survey to gauge support. The results indicated high levels of support from communities in the vicinity of the proposal. A household survey of the Upper Yarra Shire in Victoria showed walking as the most popular recreation pursuit, with cycling fifth. The local rail-trail was twice as popular as the next most popular recreation facility in the area (Ministerial Task Force, 1995).

The DoT in 1993 advertised in the Sydney and local press for Expressions of Interest from local organisations for adaptive re-use of ten disused lines. Little response was generated, with generally only one response per line, primarily from train enthusiast groups. However it should be noted that it was a condition of tender that the rails and infrastructure remain in place. Disused lines where this process has led to a successful adaptive re-use include: reinstatement of the Tramway at Loftus to Royal National Park, Thirlmere Railway Museum and Greenway-1 at Toronto. It must be mentioned that all these projects have received a substantial amount of subsidy and grant income There was some strong interest expressed for developing a 'greenway' along the Yeoval-Dubbo disused line, but local opposition from rural landholders deterred any further development. Refer to **Appendix 7** for a sample advertisement.

5.2.2 Attitudes Towards Safety

What is the attitude, especially among railway authorities, towards the safety of railway corridors as locations for cycleways?

This issue will firstly address attitudes towards safety, then will address the actual specific issue of safety and any research undertaken.

Attitudes to Safety of Rail-Trails
The rail authorities in NSW have safety as a major goal as reflected in their mission. The importance of rail safety is reflected in having a specific Rail Safety Act. When contacted in the course of this study, the informal response from the NSW rail authorities with regard to

sharing an active rail corridor was varied, ranging from mild enthusiasm to scepticism, depending on the particular officer. A number of safety issues were raised including: dangers posed by moving trains; conflict with other railway activities within the corridor; potential conflict with railway passengers; potential contact with high voltage power lines; bringing the public nearer active lines; and potential impact on communications equipment and signalling. These specific issues are discussed below.

Although the rail authorities in NSW were not asked formally to comment on issues related to safety as part of this study, some response to a draft document and subsequent discussions have provided some response. The only formal opportunity for the SRA to comment on rail-trail proposals prior to this study was in relation to the Maud St., Newcastle proposal (discussed in **Section 6.24** below) The concept was rejected on a number of grounds as described in a letter from SRA to University of Newcastle:

- unsafe sight distances over a narrow shared section of service track
- instability of a rock embankment above a section of the proposed route.
- proximity of the proposed cycleway route to the running lines
- potential for impact on night-time train operations due to lights on bicycles
- emergency conditions could put cyclists/pedestrians at risk.

Although "safety" and "liability" have often been raised as major concerns by rail authorities, we have not been able to find any information to show how this view is arrived at or supported in terms of detailed exposure and accident data or injury statistics or risk analysis undertaken. The situation in other States is the same; rail authorities display a reluctance to consider cycleways along rail corridors due primarily to safety concerns and issues of liability, while citing no particular specific data in support of this position.

An indication of the caution with which the rail authorities view safety concerns can be found in correspondence regarding the Maud Street proposal. This proposal involved location of a cycleway within the Main Northern Line corridor at Mayfield, including shared use of a section of maintenance track and passage under the Maud Street rail overbridge. Extracts from correspondence between the SRA and proponents regarding safety include:

> *"safety must remain the determining factor in issues of this nature" (Regional Manager, Country North, State Rail to Newcastle University Students Assoc., March 22, 1996)*
>
> *"State Rail's past investigations into earlier route proposals have found many aspects which raise safety concerns..." (Minister for Transport, to Member for Waratah, undated)*
>
> *"a number of options and amendments have been considered, with none of these being able to overcome State Rail's operational and safety concerns.....Safety is of paramount importance and an area where State Rail can allow no compromise..." (Chief Executive State Rail to Newcastle Cycleways Movement Inc., 20 May 1996).*

As reported by RTC (1996), Sustrans (1993), and Ministerial Taskforce, (1994), railway authorities have generally been extremely cautious when considering railway corridors for

use by cyclists and the general public, especially at the time it is initially proposed. The consultants have been made aware of this type of scenario in a number of locations including:

- in Melbourne, where prior to cycleways installed within the corridors the PTC were very concerned about safety aspects but were directed by their Minister to provide the cycleways. Since then it is understood that the PTC have accepted rail-trails and no major incidents have occurred to date
- at Como (NSW) where a cycleway follows alongside an active corridor sharing a section of the route with maintenance access. This project, which has been very successful, took a lot of convincing over a ten year period to implement. As it was one of the first rails-with-trails project in NSW, safety issues were the main concern
- in Perth negotiations on implementation of a proposed veloways network continues after four years with issues related to safety bring the main area of concern expressed by Westrail.

This attitude towards safety may reflect the fact that rail authorities generally have not had first-hand experience of non-rail users having free access to the rail corridor, and perceive this as an inherently dangerous proposition. Concerns of a more practical nature, often mentioned along with safety concerns, include:

- the impact that provision of rails-with-trails would have on day-to-day maintenance operations; and,
- increased vandalism as a result of easier general public access to railway infrastructure.

It must be remembered that railway authorities in NSW have in the past accommodated other uses within the corridor such as cabling and pipeline utility services.

Addressing Specific Safety Issues

A review of evidence from a range of situations suggests that a well designed, constructed and maintained cycleway alongside an active railway line (with adequate separation of users and provision for maintenance access) provides far safer cycling conditions than on a high stress road network. The view that safety concerns can be adequately addressed and managed is supported by a survey of 37 trails within active corridors undertaken by RTC, where no trail user accidents have ever been reported (Kraich, 1996). Results of this survey are discussed in more detail below, whilst a copy of the Executive Summary from this report is reproduced as **Appendix 8.**

Literature produced from cyclist organisations supports the view that safety fears and perceptions regarding rail-with-trails proposals are unfounded. A number of cyclist advocates tend to the opinion that “safety” is used as an excuse for refusing to allow other users to share railway corridors. Although this assertion is not provable, it is the reported experience of rail-with-trails proponents that, even if safety concerns are satisfactorily addressed, other non-related objections to proposals continue to be raised by rail authorities, until either proposals are dropped or political (i.e. Ministerial) intervention breaks the “log jam” and proposals progress.

With regard to local authorities, Bikewest reports they have been generally supportive of Veloways, as long as they do not incur any development or maintenance costs.

Specific safety issues are addressed below.

Non-Rail Users Within the Corridor

Dangers Posed By Moving Trains (especially high speed trains and quiet electric trains). A survey by Kraich (1996) of 37 trails within the rail corridor in the US found that trails adjacent to active rails appear to be no more dangerous than trails alone or adjacent to city streets. Despite a combined total of over 5 million users (or an average of 250,000 users per annum per trail), there had been no reported accidents on the rail-trails. The high speed lines (on which trains travel at up to 130kmh) are separated from cycleways using fencing or grade separation. A copy of the Executive Summary from this report is reproduced as **Appendix 8**.

Encouraging Users Nearer Active Lines - in urban areas there is likely to be a wide cross-section of people who will use rail-trails, except in the situation of a veloway restricted to cyclists. However, even if the facility does attract a far greater number of people closer to the active line, provision of fencing would ensure they are protected from railway activities. Apart from the railway concourse and platform areas restricted to ticket holders, there are many existing situations where the public is allowed close to railway activities, but separated by fencing. These risks are small compared with standing on platform edges. These risks are accepted by rail authorities (and the community) everyday as passengers are requested to remain behind a painted edge-line approximately 0.5m from passing trains.

← *Cover of CityRail Strategic Directions 1994-2016 - passenger standing on platforms and moving trains are an accepted par of the rail transport system*

For rail-trails alongside a corridor used by tourist trains, long lengths of security fencing would be impractical and unnecessary. The users are likely to be well acquainted with the risks and issues, and the tourist trains are likely to be far less frequent, travel at lower

speeds, and – for the steam trains such as a Thirlmere – far more noticeable. In most situations adequate separation is provided by grades (e.g. formation on embankment or in a cutting), vegetation, or location of the trail some distance from the formation.

Distraction from Cyclists lights - the potential for cyclists lights to distract/confuse train drivers at night was raised as an issue for the Maud Street Newcastle proposal. In the urban situation it is highly unlikely that the low power of cyclists lights would create any additional interference compared with motor vehicle headlights, security lighting, rail maintenance vehicles etc. alongside the corridor. In many cases cyclists ride on roads parallel to the rail lines, yet there is no evidence that this has created any problems in the past. Most of the time the routes would be located on the outside of the corridor, and in some cases, separated in elevation from the running lines and there would only be limited situations on bends where cyclists' lights could possibly confuse train drivers. If this is seen as a problem at a particular location (which is doubtful) screening can be placed over the fencing.

Environmental Risks within the Corridor

As is the case for all trails and cycleways, there can be situations where the surrounding environment can pose a safety risk for trail users, for example rock falls or slips from steep embankments, falling limbs from trees, poor embankment stability, or flooding risks. It would be essential that corridors are fully surveyed and assessed during the design and construction stage to eliminate or mitigate such risks. As long as these factors are recognised and costed, they can generally be resolved through embankment stabilisation, fencing, tree maintenance, or warning signage.

Safety Issues Related to Railway Activities

Railway Maintenance - the main issue here relates to active corridors where maintenance vehicles are required to travel along or across sections of the rails-with-trail. Rail authorities have raised the possibility that a cyclist could collide with the maintenance vehicle, staff or debris or tools left on the cycleway. This argument almost certainly underestimates the ability for cyclists to avoid a potential conflict situation. When cycling on-road cyclists are constantly aware of these sorts of situations and act accordingly. The survey by Kraich (1996), did not identify a single incident of this nature. Most complaints documented in the literature (e.g. Moore, et al 1994; Kraich, 1996) are of debris left by maintenance crews. Protocol should be developed to alert trail users of activity on the trail, and alternative routes designated where line closure necessitates constant use of a shared section of the rails-with-trails by machinery and vehicles.

Safety of Train Operations - Separation of rail-trails from active lines by fencing would preclude any direct impact on operations. This is supported by the Kraich study (1996), which found that despite millions of users per year, there were no identified instances where rail-trails had interfered with the safe operation of the railway. Naturally, any structural works in the rail corridor would need to be fully investigated and designed by qualified persons in accordance with the appropriate design and construction standards.

Rails-with-Trails Construction - Discussions with Westrail in Western Australia identified a potential impact on communications equipment and signalling during the construction stage.

However this is mainly a problem with relocation of fences and poor knowledge of cable location and/or contractor control and supervision. Any design or construction work for a rails-with-trails project must ensure that cable and signal equipment is not affected. Development of the GIS mapping system for CityRail network will assist in this regard. Given that the rails-with-trails would generally be located on the outside of corridor away from the active lines, it would not be anticipated that construction would impact on railway operations. Standard procedures and certified operators would need to be used during the construction stage, with on-site supervision by rail authorities.

Safety of Railway Passengers

An issue raised in development of Perth veloways is potential collision risks between cyclists and pedestrians where a rails-with-trails passes a station. This is probably of more concern in Perth than it would be in Sydney, due to the long lengths of proposed veloway running past all railway stations at grade. They have proposed grade separations to carry the rails-with-trails over or under station entrances and car parks if necessary. However, it is likely that these would be used in only a few situations where there is high and constant pedestrian traffic.

Research undertaken in the UK in regard to pedestrian cyclist conflict suggests that cyclists and pedestrians can quite safely co-exist sharing footpaths, and that cyclists modify their behaviour where pedestrian traffic is heavy (Trevelyan and Morgan, 1993). Where a cycleway passes a station, chicanes or other devices can be used to reduce the speed of passing cyclists and ensure pedestrian priority. As the experience in WA indicates, where cyclists already use at-grade rail crossings with pedestrians few problems have been encountered.

There can also be conflict between pedestrians and cyclists on the trails themselves, especially if they are well used by pedestrians and/or the facility permits higher speeds by cyclists. Segregated facilities could be used in this instance, or linemarking provided down the centreline of trails. In most instances, the provision of well designed rails-with-trails can be expected to improve the safety of pedestrian access to stations, particularly where informal or illegal use of the corridor currently occurs.

Personal Safety and Security Issues

The issue of personal safety is common to all off-road pathways and access ways leading to railway stations, and use of trails in non-urban areas such as national parks. There are no particular features that indicate rail-trails would pose any greater risks to personal safety than other trails or cycleways. The issue of personal safety and security on the trail is considered by the RTC in their publication *Trails for the Twenty-First Century* (Ryan, 1993). Good design of rail-trails prevents many security problems. RTC suggest that as with most parks, the key area of concern for personal safety has been found to be car parks and trail-heads. Recommended practices to improve personal safety are:

- security fencing around the car park (this is standard practice at CityRail car parks)
- installation of security lighting at trailheads and major road crossings or activity areas. Night lighting along the longer trails is not recommended due to the cost and doubtful benefits. (security lighting of routes providing access to stations would be useful in the

Greater Metropolitan Region - although lighting levels for personal safety are generally far greater than required for cyclists to safely negotiate an off-road cycleway.)

- landscaping and vegetation near the trail can be managed to reduce potential hiding places for would-be offenders
- if trail security is perceived as a problem, a trail patrol could be organised to provide assistance and information. The patrol may best be done on bikes
- emergency telephones could be provided at car parks or stations
- ensure emergency vehicles can access the rail-trail

5.2.3 Level of Support Amongst Stakeholders & Securing Endorsement

ISSUE: What has been the general level of support for cycleways along railway corridors received from stakeholders including the cycling community, various levels of government and rail authorities? How was endorsement secured?

Both the UK and the US experience has been that cycleways along active rail corridors, and multi-use trails along disused lines, have received a tremendous level of support as measured by:

- consistent community wide support for concepts as originally proposed
- high levels of support and donations of labour, expertise and materials during investigation and construction phases
- high levels of use of completed facilities. 1 in 3 of the US population now use rail-trails on an annual basis.

The highest level of support and use has generally been from cyclists and walkers, with a fairly low level of interest and use by horse-riders.

A great level of support for Sustrans was displayed when it launched a public funding campaign in 1993. Membership rose from 500 to 5,000. Sustrans sees this as important in developing new routes, particularly in country areas where local authorities are less sympathetic to traffic-free provision (Sustrans, 1994). Sustrans draws on public support by asking supporters to:

- establish a monthly standing order to provide regular and reliable income
- help recruit others
- let Sustrans know of contacts with specialist local knowledge
- help writing letters
- arrange invitations for Sustrans to present to local authorities
- join Sustrans work camps
- leave a legacy to Sustrans

In Western Australia, Trailswest investigations revealed high levels of community support for the rail-trails concept. This support was also found in surveys conducted following the implementation of rail-trails (Trailswest, 1994).

Government Agency Support

For many rail-trail projects, government support has been crucial in providing funding, expertise, management or the necessary political backing. The Federal funding support for the Toronto-Fassifern 'Greenway-1' has been the major factor in bringing the project to fruition. At a Federal level in the US, legislative and funding support through the Intermodal Surface Transportation Efficiency Act (ISTEA) has resulted in a rapid increase in the number of projects that could be undertaken. Many of these projects would not have been possible without this Federal support.

At a State level the Victorian Government has provided managerial expertise to local community groups through the Department of Conservation and Natural Resources. Similarly in Western Australia agency support via Bikewest, Main Roads Western Australia and the Department of Conservation and Land Management (CALM) has enabled both urban commuting and rural multi-use trails to succeed.

Above all though, local councils can have the greatest role in any rail-trail proposal. Almost all successful rail-trails have needed local input and involvement of councils to get off the ground and to be successfully maintained. Councils are reluctant to be involved if they see a project as being a financial drain and/or as posing major liability risks.

Rail Enthusiasts

In general terms, rail enthusiasts are not unduly concerned about rail-trails proposals provided:

- rail infrastructure remains in place and proposals in no way prejudice any potential railway or tourist train use in the future
- the trail is separated entirely from the rail line.

However, any proposals that involve the removal of rail tracks for trail construction, or compromise in any way the future re-use of the corridor have met with vehement opposition. Recent discussions between proponents for establishing a rail-trail and train enthusiasts regarding the future of the Glenn Innes line is evidence of this. Rail enthusiasts do agree however with the general concept of a shared corridor either alongside, or on separate sections of, the line. Such complementary development is supported by the Association of Railway Preservation Groups NSW.

Cyclists Organisations

Throughout the world, cyclist organisations have understandably been among the strongest supporters of rail-trails. This can be seen from the strong support for the Sustrans work by the Bicycle Association of the UK and local user groups, and in the US by the partnership of the Bicycle Federation of America and the RTC. In Australia the Bicycle Transport Alliance in WA has worked closely with and supported Bikewest in the planning for the veloway network. Bicycle Victoria has involvement in six of the rail-trails in that State, and as the peak cyclist organisation they are more inclined to support those projects that:

- have local BUG support
- are close to public transport
- have a committee of management
- will be used largely for local cycling by local people

How Endorsement is Secured

The experience for most proposals is that it takes some years to gain necessary approvals, and to win support from various stakeholders. Winning support seems to be easier once the local community can appreciate the benefits, particularly if it can be demonstrated that the proposals come with a degree of monetary injection to the local community.

As demonstrated in Victoria, strong political backing finally enabled government authorities to push ahead with rail-trail proposals. In Western Australia, support from Westrail is being secured by careful negotiation, by examining various design and management issues and by resolving problems thoroughly as they arise. However, this process has been time-consuming and frustrating at times.

A clear message from RTC experience in the US is that local support can be gained if various stakeholders can be seen as "partners" in a community project which has broad appeal. This is demonstrated in a local case with Greenway-1 (Refer box) where local support was the catalyst for implementation of a landmark cycleway.

Greenway-1: an example of securing local support

The 4km of railway between Toronto and Fassifern on the NSW Central Coast was completed in 1996 as NSW's first official "rail-trail". The trail is already well used by locals, and provides an off-road cycleway between Toronto, situated on the western shores of Lake Macquarie on the Central Coast, and Fassifern Station. The cycleway is to be complemented by the installation of lockers at Fassifern station.

Initial action was by 2 local progress associations. A public meeting was held, and 12 representatives from a range of interest groups were elected from the floor to form a committee under section 527 (now 335) of the Local Government Act. This Committee then prepared a grant submission. The corridor was leased to Lake Macquarie Council who in turn lease the land to the Toronto-Fassifern Greenway Committee.

Local support for Greenway-1 has continued through assistance from Greening Australia, who provided access to 'Operation Propagation'. This program involves local schools in the propagation and planting of trees and shrubs for the corridor. A grove is also to be established with the assistance the Cancer Council in the memory of people who have died of cancer. It is understood that the local schools have been involved in an 'adopt a tree' scheme where each tree is individually maintained by a student. The Committee feel that this has helped to maintain local interest. The watering of plants has also been undertaken by the local Bush Fire Brigade.

The opinions and concerns of the local residents were sought in the planing stages, and local participation encouraged through the establishment of Landcare groups.

All this demonstrates the value of local 'ownership' of a rail-trails project.

5.2.4 Integration with the Transport Network

ISSUE: To what extent are cycleways along railway corridors integrated with established on-road bicycle routes and local access to railway stations?

On-Road Bicycle Routes

Bicycle networks are now being planned for much of urban NSW. The chief issue is how the planned on-road network can be used to guide the development of rails-with-trails opportunities. There are clearly benefits in linking rail-trails proposals to on-road proposals because that is where most funding is directed, and both types of facilities can together provide a comprehensive and coherent network.

Most cycleways along rail corridors connect with the road network. A consistent and intentional connection with on-road bicycle routes is provided less frequently. In the US and the UK the pattern seems to be that as a rail-trail develops and popularity increases, both on-road and off-road routes are provided to link to the rail-trail corridor. Where an existing on-road route is crossed by a proposed cycleway every effort is normally made to connect to this route. In fact, in the UK road authorities provide funding for any connection to the road system. DoT in the UK has an overall philosophy of concentrating on coherent/comprehensive network building. This is illustrated in **Figure 5** below.

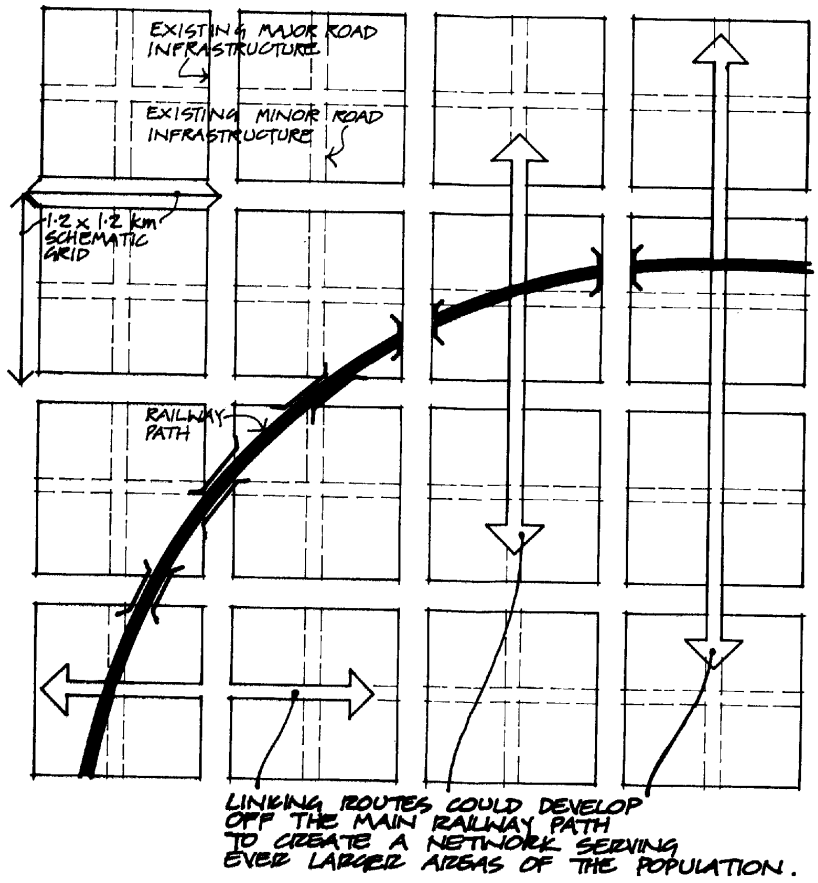

Figure 5 *- Potential for rail-trails integration in cycle network* Source: DoT, 1982 P64

The two examples in Australia where there is integration between rail-trails and the bicycle network is Perth (proposed veloways), and in Melbourne (Principal Bike routes). The Perth veloway 'network' simply consists of constructing cycleways along the entire length of the three rail corridors which radiate from the Perth CBD. Allowance is made for 50m of connections to the on-road network at each station and to roads which run parallel to the rail corridor. The works are also to be integrated with the upgrading and development of railway stations.

In comparison to these cities, Sydney has an ad hoc mix of sub-regional networks, local routes ether in place or planned (of varying standards) and a few long lengths of major off-road facilities. The RTA has recently released 'Draft NSW Network Strategic Maps', which are being developed to *"enable a more co-ordinated planning and implementation process for the bicycle network across the State"* (RTA,1996). However, at least for the Sydney metro area, the maps are primarily an inventory of existing and proposed sub-regional, local and recreational cycleways, rather than being an identified and cohesive strategic network.

Bicycle NSW was contracted to develop a regional routes network for Sydney in 1992-93, primarily using main roads. For the BNSW Regional Routes project a 2-3km grid was adopted, with destinations local to regional-based (Bicycle Institute of NSW, 1993). In developing the network, the consultants looked at desire lines and destinations, linking to transport nodes, providing cross-town journeys and directness. Coincidentally, the 2-3 km grid also approximates the average distance between stations in the Greater Metropolitan Region. Despite not having been taken further, this work provides a useful tool for identifying improvements in a bicycle network.

Thus for the Sydney metro area, the identification of rails-with-trails opportunities for this project must rely on an eclectic mix of linking into strategic routes developed, local knowledge, input from the consultation process and work undertaken by BNSW. Development of any rail-trails opportunities can make use of this inventory, but there are also likely to be many instances where key rails-with-trails opportunities will, in turn influence the planning of the principal bicycle network.

Newcastle and Wollongong have strategic bike plans, with Newcastle's updated plan being the most comprehensive. For both of these areas their respective bike plans have been able to be used to identify where rails-with-trails opportunities could provide strategic connections.

Local Access to Railway Stations

In many cases, the problem has not been so much how to provide access to, but how to get past, railway stations. Many of the road agencies in Australia, including the RTA, seek to encourage cycling to public transport interchanges by providing both on-road and off-road cycle routes. The Toronto-Fassifern 'Greenway-1' is a prime example of a cycleway constructed alongside a disused rail line which provides access to the local station. In this case, this ease of access is to be complemented by the provision of end-of-trip facilities (bike lockers).

5.2.5 Access to the Road System

ISSUE: how frequently can long-distance cycleways along railway corridors be accessed from the road system?

The experience with established rail-trails in Australia and overseas is that road systems and the rail network have often developed using the same general corridor. These link centres of population and other trip producers and attractors. The degree to which the trails can be accessed from this road network often depends on the population density, and thus the density of the road network.

In urban areas, railway stations are located at intervals of about 1-2km, and this is where the major roads generally cross the rail corridor. Minor roads and pedestrians ways cross over or under corridors at intervals less than this. Thus, in urban areas there are ample opportunities to link rail-trails to the on-road bicycle network and road system provided that all of the existing crossing points can be utilised. As a guide, cycleways should be linked to the road system at least every 300-500m. At this distance access would be provided approximately between each pair of railway stations in addition to the road network accessing the stations themselves.

In semi-rural areas, stations and hence road crossings are less regular and can be separated by distances of between 3-10km. Rural access and unsealed road crossings may be more frequent. Even at this density there would be sufficiently regular access to the road system in most cases. However, in the semi-rural and urban fringe areas where there is commuting potential, the rail corridor route should ensure that the cycleway can access the road system more frequently.

In rural areas, access to the rail corridor is much less frequent and depends on the proximity of interconnecting roads serving the same destination and whether the rail line crosses the road. In most of the lines studied, the rural road network is rarely more than 1km away from the rail corridor, however the intermediate land may be privately owned. While each individual case would need to be reviewed, entry to and exit from the road system at intervals of about 10-15km would provide sufficient points to access the trail for novice cyclists, yet provide a degree of the continuity and "remoteness" desired by more experienced users and adventure tourers.

According to Sustrans, *"it is unlikely that any railway path will satisfactorily form a good route entirely on its own, as links and connections will be needed to reach places of interest."* Sustrans , (1994)

5.2.6 Ownership, Management and Maintenance

ISSUE: Who owns cycleways along railway corridors and who maintains these facilities?

Rails-with-Trails

Because trails fall into the category of 'fixtures' they would belong to the land owner. The land owner in NSW would generally be the State Rail Authority, or the RAC for a facility

constructed as an addition to a railway bridge. Naturally, a simple transfer of ownership of the land required for the trail to the rail-trail proponent would also be possible.

Even though a cycleway may be leased or licensed to a local council, and constructed with, say, RTA funding, ownership of the pavement and fixed structures would remain with the owner of the freehold – generally State Rail.

Day to-day management and responsibility for maintenance of the facility may be handled in various ways. Examples of approaches adopted include:

- in Melbourne the active rail corridor is owned and controlled by the TPC, with the rails-with-trails managed under license by the local council
- in Perth, Westrail owns the corridor and leases a portion of land for each proposed veloway on the boundary of each corridor to the Main Roads Department of Western Australia
- in the US, according to the survey by Kraich (1996), of the 37 rails-with-trails 17 of the trail corridors were owned by the rail-trail agency. Of those not claiming ownership, a full or partial lease was obtained. The city or town (council) is responsible for maintaining 24 of the trails, the state or county for 11 and the remainder were maintained by "friends" of the trail. In only 3 out of the 34 rails-with-trails investigated were the trails maintained by the railroad.

In a response to this study, SRA have indicated that they would want to license rails-with-trails rather than provide leases or transfer ownership. Although a license would result in greater liability to the SRA, it would give them greater control of activities within the corridor. A license would also be more appropriate where only a narrow strip of corridor is to be used, as distinct from disused rail corridors where the entire corridor can be leased or transferred. Although the terminology applied to Greenway- 1 was an 'agreement to let and take', SRA now refer to these simply as 'license agreements'.

Licensing of rails-with-trails requires a number of issues to be resolved, such as:

- who sets the license conditions?
- how much control would be exerted over trail users?
- under what circumstances could the trail be closed? (For instance, would the trail be closed because of day-to-day maintenance needs, or an incidence of vandalism, or only during major line closures?)
- who would make a decision to close the trail?

These issues will need to be resolved on a case-by-case basis, taking into account reasonable access requirements for use of the trail, and requirements of the railway authority.

A related issue, raised by local government, is the lack of security of tenure available when taking on a lease or license, particularly when the trail agency (such as a Council) will need to devote significant funds towards construction. Under existing SRA policy, only a short term (12 month) tenure is available, known as a "Community Lease". These can be terminated 'at will' by the SRA. Community Leases generally cost about $350 per annum and are given to associations such as the Scouts. Greater security is available through

commercial leases. Generally the SRA enters into commercial leases at market rates for periods up to five years, however market rates may be difficult to establish for narrow strips of land along railway corridors.

The public nature of the rail corridor and its use as a trail also need to be taken into account. This could be done by having a suitable form of license agreement whereby the owner of the land, say the SRA, provides a long term right to the public to use the alignment. This right would be in consideration of the provision of resources to develop the trail by the funding body – the local council, RTA, DoT etc.. This long term license arrangement would recognise that a rail-trail is different to use by, for instance a Scout group or rail preservation society, who seek a right of exclusive use. Long-term licenses could be terminated under certain conditions, such as in the case of a rail amplification project.

For most corridors likely future requirements are reasonably foreseeable and can be taken into account when proposals for rails-with-trails are considered. In this context rail-trails could be seen as de-facto 'railway use'. In most cases any commercial return foregone from a long-term license over a narrow strip of corridor would be minimal compared with the cost of the rails-with-trails facility.

Maintenance of cycleway facilities (and the leased or licensed area) would depend on the form of agreement, but would normally be written into the lease/license as the responsibility of the lessee/licensee (i.e. local council if this was the case). Where a portion of the corridor was separated from the rest of the corridor by the cycleway, State Rail would remain responsible for its maintenance.

There is also a need for the lease or license to define where responsibility for the rail-trail ends. For instance if a rail-trail passes a CityRail station, CityRail may want to have some responsibility for control over personal security. This may have to be resolved on a case-by-case basis. Generally rails-with-trails connected to the on-road network would revert to RTA responsibility for the on-road component. However, the RTA may bear some liability if they are involved in funding or advising in the design of facilities.

Rails-to-Trails

The experience for rails-to-trails varies markedly across jurisdictions. The major factor is the previous ownership of the disused corridor. For instance, in the US most disused corridors were originally owned by private railroad companies, with the entire corridor then purchased by the rail-trail organisation. In many cases this was the State RTC. Following purchase, the corridors are sometimes vested to a land management agency (such as US Parks Services). Corridors are managed and maintained by the rail-trail organisation or land management agency with assistance from "friends of the rail-trails groups"

The situation in Victoria as explained in section 4.2.3 is that ownership is vested to DCNR, with day-to-day management and maintenance responsibilities undertaken by an elected committee of management (COM). The COM is assisted by "friends of the trail" groups in a similar manner to the US RTC In Western Australia, Westrail generally retains ownership with trails managed by a local COM.

In the case of "Greenway - 1" an agreement has been made between State Rail and Lake Macquarie City Council for the latter to "Let and Take" over the corridor for the purposes of a cycleway and pedestrian walkway. This is essentially a license agreement. Responsibility for the agreement has now been devolved from LMCC to the Toronto-Fassifern section 335 Committee, set up under the Local Government Act. However, State Rail remains the land owner and thus "owns" cycleway facilities, whilst the RAC owns the disused railway infrastructure. In accordance with the license agreement, corridor maintenance is a responsibility of the section 335 Committee.

For NSW the situation envisaged for most of the disused corridors is that they would remain under State Rail ownership, while RAC would own all infrastructure that had a potential rail function. If ownership of the corridor was vested in a land management agency (such as DL&WC) then that would be the owner of both land and fixed infrastructure; however, this would require legislative amendments. Maintenance of rail-trails would most likely fall to a Management Committee if this had been set up. Otherwise the land owner and/or the provider of the infrastructure would be responsible.

5.2.7 Space Within the Railway Corridor

ISSUE: Has sufficient space for cycleways generally existed alongside rail corridors, or has additional space been required?

Characteristics of Urban Rail Corridors

Paradoxically, the very locations where rail corridors could enable rails-with-trails to overcome the most difficult topographic and traffic constraints are invariably corridors which do not easily lend themselves to shared usage. This is because the rail corridor is usually constrained at these locations, with the active formation either within a cutting or on an embankment, or there is a road overbridge constricting opportunities. Conversely, corridors within the flatter and less densely settled areas (such as the Southern Line near Campbelltown) tend to provide easier conditions for shared use, but they often have reasonable low-stress on-road alternatives parallel to the rail corridor over easy grades.

Another common feature is that although the corridor between stations is potentially available for a rail-with-trail, at each station there is likely to be a major road crossing at an overbridge. Many of these bridges, particularly the older ones, do not provide additional spans to enable a route to pass under the bridge outside of the formation. At stations the potential for a continuous route is often hampered by 'park and ride' car parks, station buildings and infrastructure such as electricity substations and signal boxes.

Service tracks vary in location; either alongside the formation where the terrain is level, or away from formation if the corridor is in a cutting or on an embankment. The surfaces of these service tracks vary from unformed track over bare soil, to compacted gravel/pad base. Where the corridor is very constricted there may be no service track at all. There are often utilities such as gas, telecommunications or high pressure oil pipelines.

Minimum Clearances and Design Specifications

The two factors important in determining whether there is sufficient room within a particular corridor for a rails-with-trails facility are:

- minimum separation distance between the tracks and cycleway
- minimum acceptable width for the rails-with-trail facility

Minimum Separation Distance

In practice this varies according to the individual rail authority and prevailing conditions. There is no specific standard or guideline separation distance for trails alongside active lines in NSW. RAC specification C2104 provides for clearance between the tracks and the shoulder/placement of structures. This distance generally allows for movement of vehicles between overhead wiring stanchions and any structure or fencing. The specified distance is 5.0m for non-electrified and 6.2m for electrified lines measured from the track centreline. This would allow for vehicles to pass between the structure and the tracks, or the stanchion if it is an electrified corridor. There is also a more general site security requirement to keep the public away from the corridor.

The speed of trains along the section is also important. For example on Greenway-1 no separation is needed as any train will be travelling at walking pace. This can be compared to the coexistence of bicycles, pedestrians and trams in an urban environment (eg. Bourke Street Mall Melbourne).

In the UK as reported in DoT (1982) and shown in **Figure 6** below, the minimum dimension allowed by the Railway Inspectorate at that time was 1.624m between the cycleway fence to the inside face of the near running rail. Considerations for a larger dimension include the frequency and speed of trains and the type of trains and the consequent likelihood of doors accidentally opening. This situation is not as relevant in NSW, as, apart from heritage trains, carriages do not have doors opening outwards. It was also noted *"it is most unlikely that British Rail would agree to paths besides high speed lines, electrified lines and to such paths using any form of level crossing"* (DoT, 1982).

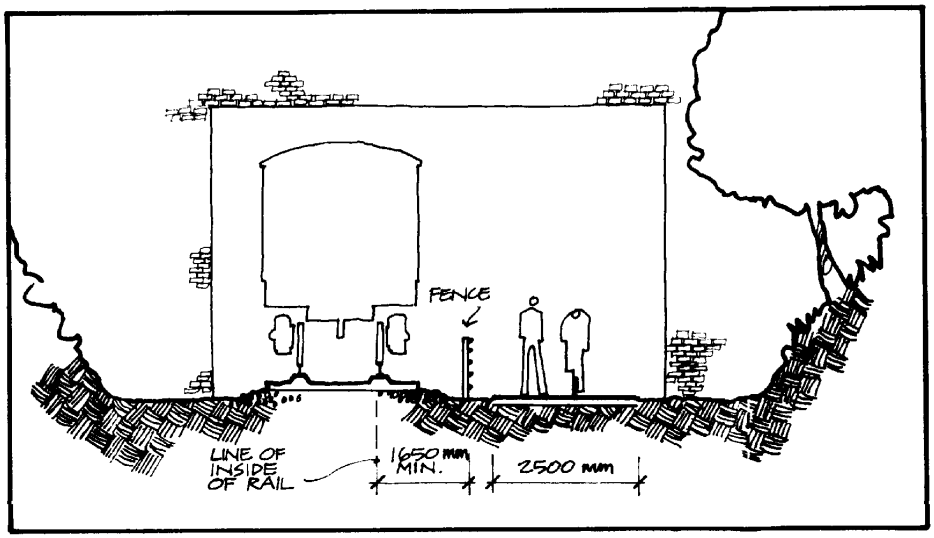

Figure 6 *- Critical dimensions of paths besides operational lines (DoT, 1982)*

Minimum Acceptable Width for a Rails-With-Trail Facility

For exact specifications of trail width the reader is directed towards published standards and guidelines including: *Austroads 14* (Austroads, 1993), *Sign Up For the Bike* (CROW, 1983), *Road & Path Quality for Cyclists* (Shepherd, 1994). The general requirement for a shared cycleway would be a width of 3.0m if significant numbers of pedestrians are expected, with 2.5m the generally accepted minimum width for shared pathway. However, the width could be reduced to a bare minimum of 1.5m if required for short sections where traffic levels are expected to be low. For planning and construction purposes a working corridor of 3-3.5m should be allowed.

Space Available within the Corridor and Need for Additional Space

Research for this study has not revealed examples of rail-trails where additional land has had to be purchased because of insufficient corridor width. Discussions with the various rail authorities have stressed that although sections of the corridor may appear unused, there are still requirements for drainage, a buffer zone, maintenance and emergency access, and room for utility services and cabling. Given the minimum acceptable clearance criteria and minimum width of pathway, space available for cycleway construction within a corridor will depend on:

- width of corridor
- space devoted to the tracks (number of tracks within the corridor, spacing between the tracks, space reserved for additional tracks)
- obstructions or structures that protrude into the corridor (such as utility equipment, buildings or bridge abutments or car parks)
- corridor terrain (i.e. whether within a steep cutting or embankment to the corridor boundary)
- to what extent funding and other resources are available to undertake engineering works to overcome any site constraints

Typically, rail corridors in NSW were established with a width of 2 chains (132ft/40.25m). For corridors with double tracks (the more common situation in built up areas), a 3.5m wide cycleway located on the extreme outside boundary of the corridor would be about 11m from the nearest running rail. However, with quadruplication and placement of a track either side of the existing formation, the cycleway would have to share the space allocated to a service track. This is illustrated in **Figure 7** below which shows a section of the East Hills corridor just south of Bardwell Park station, where amplification is proposed.

Experience with the Upfield Bikeway in Melbourne is that a cycleway can generally be accommodated within a narrow corridor alongside an active rail line for short sections to overcome squeeze points. A bare minimum separation distance of 3.0 metres between the outside track and pathway has been adopted by the PTC where the trail is constrained by railway structures and adjoining properties adjacent to Brunswick Rd level crossing (refer photo p.76). The shared pedestrian/cycleway at this location is narrowed to 1.5 metres, just enough to allow cyclists through (PTC, 1996). It should be noted that Austroads Part 14 (Austroads, 1993) also suggests 1.5m as the absolute minimum for a dual way cycle route.

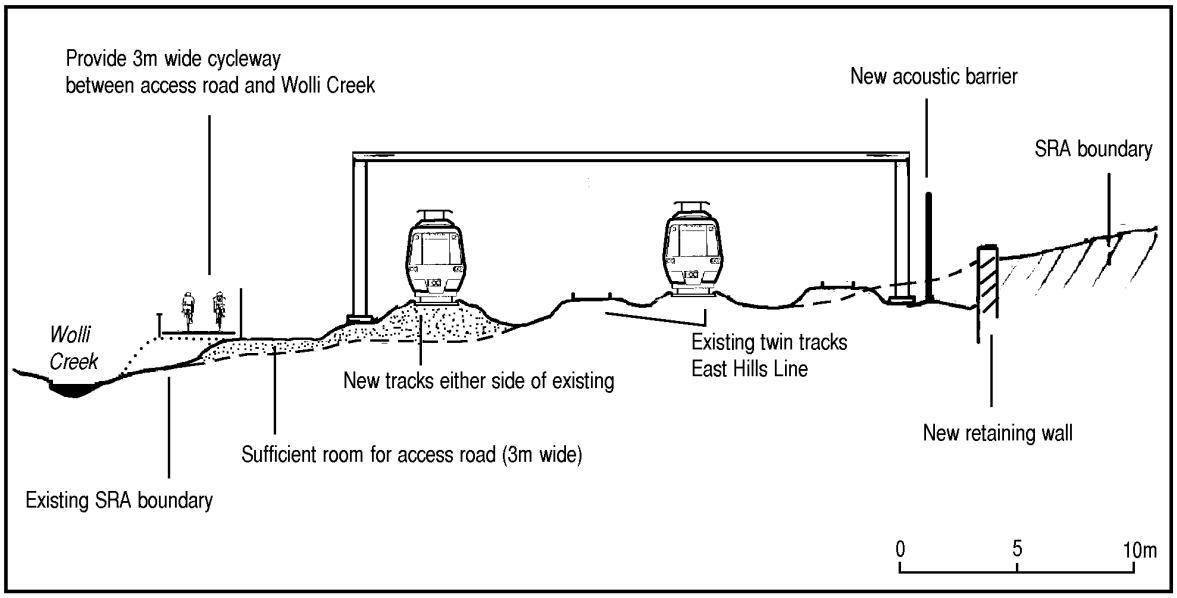

Figure 7 *- Section of rail corridor showing potential location of rails-with-trail* Source: adapted from State Rail Authority (1995b)

In Perth, most of the rail network has been built on relatively level land and most corridors provide sufficient rail-trail width. This is contrasted with the North Shore rail line in Sydney, where the effective corridor width in some sections barely exceeds the width of the formation. This is illustrated in the photos below.

← *Above: Station in Perth showing rails-with-trail in corridor*

According to survey data presented in Kraich (1996) US rails-with-trails facilities mostly have a reasonably large separation (50-100ft or 15.2-31.4m) compared with what could be achieved in the built-up areas of Sydney for example. However, the New Jersey Traction Line has a 20ft (6m) separation from corridor trails, and the Zanesville Line a 15-25ft (4.6-8m) separation.

← *North Shore line Sydney, in comparison*

Photo: Bike North, 1996

Barriers Separating Trail Users from the Active Rail Line

Rail authorities have generally required some form of barrier between rail-trails and active tracks. Often this is because of the wide range of users including pedestrians and young children, rather than just the need to protect cyclists. In the US, the most common type of barrier is a grade separation, vegetation (including trees), or ditch or some kind of fencing (Kraich, 1996). The type of barrier depends on the line. For branch lines, industrials and spurs with lower speeds, barriers are generally not regarded as necessary, and those with barriers commonly use vegetation and/or a slight grade separation.

In Melbourne, on the Capital City Trail, pine log fencing has been used, but the PTC has experienced problems with vandalism of this. Greenway-1 is proposed to be used by a 'Coffee-pot' steam tourist train, which would travel at walking pace. In this case the use of vegetation and a slight grade separation is considered adequate.

For the CityRail network, 1.8m high chain-link fencing is generally provided at the corridor boundary. This type of fencing is possibly what RAC would require to ensure separation and security, although in terms of cyclists safety a 1.5m high fence with a top rail would be adequate. Where barbed wire-topped chain-link or galvanised steel 'palisade' type fencing has been installed, it is generally to deter trespassers and reduce vandalism, rather than because of the safety of other users of the corridor.

5.2.8 Costs and Funding Sources

ISSUE: What are the costs associated with the construction and maintenance of cycleways along railway corridors and what sources of funding have been exploited?

Costs

Rails-with-Trails

The design standards, and hence capital and maintenance costs for rail-with-trails facilities, are likely to be similar to typical costs experienced for other off-road cycleways. The standard of construction (and hence cost) for strategic network routes is higher than for multi-use trails due to the need to provide smoother surfaces for road bikes, and greater directness to allow for higher average speeds. An all-weather smooth-sealed asphalt or concrete surface, smooth decking or paving would be the typical surface treatment for a commuter route. The need for night lighting will also add to costs. The overall cost will depend on such factors as:

- structures or bridges needing to be modified
- whether the route traverses a steep rise or cross-slope
- where grade separations are required to avoid pedestrian or vehicle conflict
- the degree of signage required
- requirements for better lighting for personal safety of pedestrians
- whether cabling or other services need to be considered

Trails alongside active rails may have a higher design and construct fee component than other off-road cycleways or rail-trails in rural or semi-rural areas. Case examples for rails-with-trails costings include the proposed Perth veloways, Sustrans routes in the UK, Greenway-1 in NSW and some of the RTC routes in the US. For the Perth Veloway network currently under development, where the corridor runs over relatively level ground and construction is mainly straightforward, costs for one particular line of the network are expected to average out at about $320,000 per km for the 19km Perth-Fremantle line. Expected costs range from approximately $220,000 per km for the easiest section (Karrakatta to Loch Street), to over $500,000 per km for the most expensive section, North Fremantle to Fremantle (according to data presented in McKenna Priest Shaw, 1996).

These figures compare with the actual all-up costs for the Toronto-Fassifern cycleway, Greenway-1, of about $250,000 per km for 4km of route. This is a 2.5m wide concrete cycleway adjacent to a disused line over relatively level but occasionally poorly drained land. The initial estimate for an asphalt-sealed pathway was a total of $1,555,000 or about $40,000 per km. In Sydney, costs would be expected to be well in excess of the higher Perth Veloway figure for, say, the North Shore Line, whilst the lower Veloway estimates of around $250,000 per km, and the Greenway-1 per km costs would be likely for, say, outer sections of the East Hills Line.

Detailed costings for three key projects in the Greater Metropolitan Region will be provided in **Section 6**. An allowance should also be made for preparation of a risk analysis and risk management strategy. Costs are typically $50,000 for a detailed risk analysis and $20,000 for a risk management strategy for an individual corridor.

The relative ratio of maintenance costs to capital costs is likely to be similar for rail-trails to council cycleways, at about 10% of capital cost for the life of the project (say10-15 years). This is the rate factored into cost estimates prepared by the RTA in NSW (RTA Sydney Region, 1996). Running costs would increase if long sections of night lighting were required, although in many instance this might be absorbed into overall CityRail lighting expenses, particularly if a trail was associated with pedestrian access to stations.

Rails-to-Trails in Rural Areas

Experience elsewhere with rail-to-trails, and as reported by Brodie, indicates the cost of conversion of disused railway corridors to rail-trails will depend very much on three factors:

- the existing condition of corridor; how long since last maintained, the condition of fencing and bridges and degree of weed control
- what sort of user it is being designed for (the proposed standard of surface treatment)
- whether the trail would use the formation with rails removed or would run alongside of it.

The largest single cost item is often the repair and re-engineering of bridge structures, which can run into six figure sums. These structures are required to be in sound condition for users, but especially if they cross a roadway or where pedestrians are likely to pass underneath. For the Otago Central Rail corridor in New Zealand, $100,000 has been allowed for each bridge if not in good condition. Bridges also have to be modified to provide handrails. A cost-effective interim solution where bridge re-engineering funds are not available, and the nature of the crossing allows, would be to have a crossing at grade.

Fencing will be required for unfenced corridors and repair required where fences are in poor condition. Experience in Victoria of the Warburton-Lilydale trail is that hundreds of cross fences may need to be removed from those lines which have been abandoned and have become used for grazing by adjoining landowners. The Wagga Wagga-Tumbarumba.line is such an example in NSW where many fences now cross the disused corridor.

The RTC experience regarding rail-trails construction is that they cost on average about US$33,000 per mile (or about A$39,000 per km) for a surface of compacted finely graded gravel. Often they find that salvage of rails and ballast where these can be removed can pay for corridor purchase and construction works. The NSW DL&WC indicates that a basic earth trail can be established for about $1,000-2,000 per km. Trailswest information indicates a multi-use gravelled walking trail establishment cost of about $10,000 per km (Ministerial Taskforce, 1995).

If rails are to remain in place, then it may be possible to provide a rail-trail within the corridor using a service track that generally follows the rails. Where there are cuttings and embankments the options become limited and more costly. A lower-cost solution in this instance can be to cover the rails temporarily with gravel, which can be later removed if necessary. This solution in some instances may however reduce the life of sleepers.

Other major cost items are the provision of facilities such as toilets, water points and camping/accommodation facilities. Other construction items include culverts for crossing drainage points and other minor engineering works.

The report into rail-trails by Sustrans (DoT, 1982) provides some costings for rail-trails construction. There are many factors which make it difficult to compare the costs in the UK with what could be achieved in Australia. For example, the terrain varies, work rates and practices are different and work specifications vary. Material costs (in 1982) for a smooth, compacted surface of cement stabilised fines was about STG4-10,000 per km. This equates to a current price of about $16,000-40,000 per kilometre[2]. The major cost items were found to be bridges and fences – items which were required to be put in place to start the project. Approximate establishment costs for a 2m unsealed path on clean railway ballast was $5,200 per km, rising to $13,200 for a 2.0m wide pathway on new routes and poor soils. This compares with a figure of about $10,000 per km given by Trailswest for the establishment of an unsurfaced multi-use trail.

Volunteer Labour and Materials

Donated labour and material would alter overall costings greatly. In the case of Greenway-1, a Federally-funded employment scheme (Landcare and Environmental Action Plan) provided the labour component for much of the works. The 26 week scheme, employed 12 people through a Jobskills Program. This would be equivalent to $156,000 in wages at $500 per week.

For more remote and sparsely settled rural areas, donation of labour and materials is less likely. In the UK, Sustrans found that rail-paths are well suited to labour-intensive construction, and they provide useful and satisfactory work for employment schemes. A range of 50-100 man-weeks of labour is required per km of trail (DoT, 1982). This labour component would cost $50,000 per km in Australia at a wage of $500 per week if voluntary labour was not available.

Costs can also be reduced by use of recycled materials and sponsorship of particular items. For instance, in the case of Greenway-1, a local fencing supplier provided fencing at cost, and was rewarded with a sponsor's sign attached to fencing on the bridge.

Salvage of rail, ballast and sleepers has the potential to make a contribution to the rail-trails conversion process. This of course is as long as the money is directed to conversion rather than government revenue. For instance, in the US the RTC was able to purchase the rail corridor to construct the 321-mile Cowboy Trail in Nebraska through salvage of rail and ballast. However, salvage can be problematical depending on the type of rail in place and the degree of contamination of timber sleepers and ballast. This aspect is discussed in detail by Brodie (1995). According to Griffin (1996) the value of the track is only realisable after it has been lifted and transported to the marketplace where it can be sold – the net value of the tracks in situ is near zero.

Maintenance Costs

Maintenance of rural rail-trails is an essential cost item. Evidence presented to the Trailswest Inquiry showed that rail-trails became degraded because of lack of maintenance

[2]Assuming an exchange rate in 1982 of 0.586 and an increase in the Australian CPI over the period 1982-96 from 55.3 to 120.1, these costs could be converted to 1996 Australian dollars by multiplying by a factor of about four.

funding, and lack of a local 'champion' to lobby trail managers (Ministerial Task Force, 1995). Maintenance can be expensive, as evidenced by SRA's regard of many disused lines as a liability. Maintenance costs (just to minimum requirements) are estimated to be about $1,000 per km per year (Brodie,1995). This will increase in wetter years, and decrease greatly during drought conditions due to the lack of vegetation growth and grazing by stock of weeds, thus reducing costs for weed control, fuel reduction burning or mowing.

For disused corridors, control of noxious weeds is one of the major maintenance costs and certainly is the largest maintenance cost identified by Brodie (1995). Survey work for the Greenway-1 identified 25 weed species in the corridor, a number of these being declared noxious weeds and thus requiring eradication. Fire control is another major maintenance item which must be undertaken in accordance with the provisions of the Bushfires Act 1949 No 31. This requires regular fuel reduction burning or mowing of the corridor. Maintenance effort and costs can be reduced by:

- **obtaining environmental repair grants** - such as the involvement of the recently announced Federal Green Corps, administered by the Australian Trust for Conservation Volunteers
- **using volunteers** - including Landcare and Greening Australia.
- **regular maintenance** - It is important to reduce maintenance by establishing early high levels of use and undertaking regular maintenance to prevent abuse such as vandalism, incursion by motorbikes, and rubbish dumping (DoT,1982).
- **donations** - obtaining donated materials or services from local businesses or the local council for such tasks as mowing to reduce fire hazard.
- **grazing to keep grass down** - in rural areas grazing can reduce requirements for mowing or hazard reduction burning.
- **good design** - to reduce maintenance requirements. The main factors to consider are drainage and weed control, correct selection of planting species and a design that facilitates cleaning and maintenance.
- **horses** - ensuring horses only use a rail-trail designed for them.

Other ongoing costs for the rail-trails include:

- promotion and marketing/management if necessary
- track repair - yearly for a gravel trail, more regularly if used by horses.
- maintaining signs
- clearance of culverts and drainage channels to avoid flooding
- control of animal pests
- repair of fences and barriers

Funding & Revenue Sources

"Where is the money coming from?" is probably the most commonly asked question raised in the development of rail-trail projects. The general response to this question is that rail-trail projects usually draw on a number of funding sources. For instance, funding for the 32 mile Iron Horse Trail in the US came from over a dozen sources. This trail is a converted right-of-way used by 400,000 people in 1991 (Jones, 1994). A major factor in being able to

draw on this range of funding sources was the multi-use nature of the trail. In the US one of the keys to securing ISTEA funding is to highlight the transportation (rather than recreation) aspects of the corridor (Jones, 1994).

This was also true for Greenway-1 at Toronto, which attracted $120,000 Federal funding as a 'National Bicycle Strategy - Demonstration Project'. The project was put forward as a *"pollution-free commuter link encouraging the community, and helping young people to adopt 'environment-friendly' transport options"* (Toronto-Fassifern Greenway Committee, 1994).

A point made by RTC in relation to ISTEA is the need to have projects defined and ready to commence implementation subject only to funding.

The Victorian DCNR has identified a wide range of potential funding sources for their projects. A comprehensive summary of potential fund-raising sources in Victoria is provided in the Department of Conservation and Natural Resources publication "Rail-trails Victoria: A Guide for Prospective Committees of Management" (DCNR, 1994).

In NSW, the RTA is likely to be a funding source only if a rail-trail meets the following criteria:

- forms a priority link in the identified State, Regional or Sub-regional bicycle route network
- does not duplicate any existing parallel or adjacent facility
- issues of maintenance and liability are resolved
- the proposal is supported by Council/DoT/SRA in a policy, as well as funding sense

Funding sources for rail-trail projects in NSW can include:

- **Recurrent government agency funding -** there are a number of government agencies with responsibilities for transport, tourism, recreation and land management who may be able to fund works directly from their existing programs, or indirectly through assistance in-kind. Funding for wider cycleway networks is provided by the RTA generally in conjunction with local councils; other agencies will have a role in rail-trail funding depending on local conditions. As all agencies are subject to stringent budget limitations special allocations are likely to be required in NSW to provide for any substantial direct funding of rail-trail facilities by traditional funding agencies.

- **One-off government grants and assistance programs -** ISTEA grants in the US provide US$2.1 billion per annum, of which about 50% is provided for trail and cycleway development. They will make up about 24% of their programmed works. Australian Federal grants and employment assistance programs, such as LEAP, are currently being curtailed and it is now uncertain whether alternative funding sources will become available. However, the recently announced Federal 'Green Corps' environment funding of $41 million for rural and regional Australia may be available for rail-trails projects. Ad hoc funding opportunities may also arise in relation to special events such as the year 2000, Centenary of Federation etc. Tourism NSW has limited grants available for tourism development, training and promotion. Landcare and environmental grants may also be available, possibly from the proposed Federal Environment fund in 1997-98.

- **Lotteries -** in the UK, funds from the National Millennium Lottery have been granted to Sustrans for rail-trails projects. The latest grant has provided STG47million from the Lottery.

- **Sponsorship -** may either be available through direct sponsorship of particular projects or assistance with particular sites. A sponsor may be recognised through naming rights, mention in promotional material or on a trail-side plaque or other advertising.

- **Rail salvage -** as discussed above, some major projects have been funded entirely by salvage of rail infrastructure such as rails, ballast and sleepers. Under current NSW legislation, an Act of Parliament would be needed for this to occur. After the recent restructuring of State Rail, RAC, as the owner of the infrastructure, would be likely to want some return from salvage of material.

- **Public fund-raising -** can be a major source of income for rail-trail organisations. According to Sustrans, charitable support gets a project started and government agencies are then approached to cover construction costs. Tax deductible donations from individuals and the corporate sector can also assist in funding – this would require a rail-trails organisation to be approved as a recognised charitable institution.

- **In-kind -** use of equipment or donation of materials can significantly reduce construction and maintenance costs. For example, this could involve free use of Council equipment or personnel, or surplus material from a construction company.

Rail-trails development can also lead to spin-off sources of revenue, which assist in maintaining and upgrading facilities. Revenue sources for rail-trails could include:

- **rental:** from concessions and licensed sections for cafes, food or retail outlets which utilise station buildings or land within the corridor. An example where this could work is at the northern end of Meadowbank bridge where potential high levels of use could have the potential to support a kiosk and bike hire operation
- **tours:** tour groups, in a similar manner to those using National Parks. The tour organisation is charged for use of the facility as a contribution towards maintenance. Expressions of interest could be sought from operators to run groups. However, if the corridor is zoned as a 'road reserve' rather than open space (recreation), a user charge may not be able to be levied on tour group operators
- **leasing:** leasing of land to utility companies, for income or in exchange for services such as rehabilitation maintenance or weed control
- **advertising:** leasing of space on structures for advertising. This already occurs at Pippita where the railway bridges span Parramatta Road and the M4 motorway. Highly visible urban locations would be prime sites for this form of activity which could be incorporated into the cycleway structures
- **accommodation:** camping or accommodation revenue for extended trails. Station buildings or surrounds could be used

5.2.9 Public Liability and Insurance

ISSUE: What issues relating to public liability, and insurance to cover against this, apply in cases where cycleways parallel an active railway?

Current Situation Regarding Public Liability and Insurance
Liability in NSW is primarily determined under common law with the concept of duty of care being the main issue. Duty of care may be defined as an obligation recognised by law to conform to a particular standard of conduct for the protection of others against foreseeable risks. In the event of an injury a claim is generally lodged against the occupier of the premises where an occupier either occupies or has control of the premises.

Public liability concerns are often raised by rail authorities when proposals for alternative uses of railway land are being considered. For the financial year 1994-5 the SRA was insured under a $500m general public liability policy for each and every event. Maximum excess payments were limited to $10m per year. A $400m industrial risk policy covered assets. As the owner of the land within the corridor, the SRA as the 'occupier' is most likely to be ultimately responsible for injury occurring on their property, if negligence is able to be established.

The SRA is currently liable for injury and damage on disused lines and must undertake a certain amount of work each year to reduce hazards. As owner of the infrastructure, the RAC is potentially liable for any injury occurring whilst using railway infrastructure. Vesting the land used for rail-trails to another authority would transfer liability to the new owner, however this is unlikely to be acceptable in the case of active lines. Any authority involved in the design, construction and management of a rail-trail has a degree of responsibility to ensure the safety of users. The level of liability can be significantly reduced by identifying and addressing safety issues before problems arise. The SRA currently operates risk management practices. They are strictly administered within terms of compliance and safety. There is a formal process in place for access within rail corridors by the public, however the process has not in the past addressed the issue of rail-trails.

With regard to disused corridors, State Rail has an obligation as a landowner to make and keep safe items which make up the railway infrastructure (Brodie, 1995). Whilst public safety obligations and liability issues are interrelated, certain action must be taken to minimize liability. According to Brodie, major infrastructure items which immediately require identification and attention are: bridges; level crossing signage; water towers, turntables and ash pits; and derelict rolling stock. Whilst there would be approximately 2,000 timber bridges and openings along disused corridors, major bridges located close to public roads and population centres need to be identified first and their approaches fenced off. The largest structures should also have warning signs attached to them.

The issue of liability was also considered in detail during Trailswest investigations, the relevant extract of which is reproduced as **Appendix 9.**

Risk Management Strategy
Proper risk management is the key to successful control of liability. The development of a trail should incorporate risk/liability management policies which will identify potential

hazards and ensure that the design, construction and operation of a rail-trail minimises the likelihood any incident which may lead to a claim. The experience of operators of trails along active railway lines overseas is that the likelihood of a successful claim is greatly reduced when a good risk management protocol is in place.

Relevant extracts of the Brodie report in relation to liability issues on disused corridors are reproduced below.

> *"Even though these lines are disused, State Rail still has a moral and legal responsibility to minimise risk to third parties. It is important where track infrastructure lies within station yards, that it remains visible to people who may be walking through the yard."*
>
> *"Whilst it would be difficult to prove negligence as regards an accident occurring on a railway track...it is a different matter when it comes to rotting railway bridges. Most of the bridges that appear on these disused lines are mainly of timber construction."*
>
> *"A liability issue can be raised as a result of the blocking of culverts and drains. Where such infrastructure silts up, it can become the cause of local flooding onto neighbouring land which could cause damage. A regular inspection program should be maintained." (Brodie, 1995).*

Experience of rail-trails overseas and in Victoria suggests that the liability problem of shared use of the corridor is negligible where a proper risk management protocol is instituted and maintained. The object of such a protocol is to maximise the safety of a trail and reduce the number of incidents which may be subject to a claim.

There are few management issues relating to cycleways along active railway lines that are unique to these facilities. Shared usage of routes is quite common for cycleways along roads, and through public land such as parks and reserves. Proximity to trains moving at speed is often cited as a problem. However, as described earlier, there are instances in NSW where pedestrian and cycleway facilities are as close as 4 metres to active lines, and significantly less than this in the case of the cycleway across the Sydney Harbour Bridge. This is contrasted to the on-road situation where there is no physical separation between cyclists and trucks passing at speed (although the driver can take evasive action). For rail-with-trails adequate fencing to separate users from rail activities is regarded as the fundamental issue with respect to safe operations.

Techniques and design to safely manage non-rail users can be gained by studying overseas examples of rails-with-trails, and also situations in Melbourne and Perth. Local government and the RTA also deal with shared use issues (on- and off-road) on a regular basis and may be a further source of case examples of risk management.

In terms of any recommended action, rail-trail liability should be addressed by developing risk management protocols to ensure that foreseeable risk is minimised. Such a program would commence with a preliminary hazard analysis/survey and continue through the design

and construction process to ensure that best practice procedures are used. Ongoing risk management must be strictly maintained, including regular maintenance patrols and an effective mechanism for dealing with any problems reported.

5.2.10 Assessment of Cycleways

ISSUE: What formal assessment of completed cycleways along railway corridors has taken place?

It must be said that the level of assessment of bicycle facilities post-construction throughout the world is very poor. Very few facility or program assessment criteria have been developed, baseline monitoring conducted, assessment or surveys undertaken. Despite the plethora of bicycle studies in Australia, we can find no comprehensive assessments of any cycleways project that has been undertaken within Australia. No formal assessment of the Federal Government National Bicycle Strategy Demonstration projects has been undertaken to date. Thus, there is very little specific information on cycleway assessment, let alone assessment of rail-trails projects.

The only recent documented survey of 'rails-with-trails' that the consultants are aware of is the report referred to earlier by Kraich, for the RTC in the United States (Kraich, 1996). The survey of 37 rails-with-trails managers sought responses to 31 topics covering the trail characteristics, rail operation, users, liability insurance, accidents, maintenance and corridor acquisition. The executive summary of the report is reproduced as **Appendix 8**. The only other documented assessment is that conducted by Siderelis et al (1994), as discussed earlier in Section 2.2 This study established demand models for three rail-trails in the US, and made estimates of the economic benefits to the local area arising from each visitor to the trail.

The only documented Australian assessment of rail-trails use and opinions is the household survey conducted by WATC to assess opinions on rail-trails (WATCa, 1995), and a survey of users or adjoining landholders along the Margaret River-Cowarumup rail-trail (McGlew and Burton, 1995). For the household opinion survey they found that 58% of those surveyed used cycleways and walking trails, with 18% using them once per month or more frequently. 50% of those surveyed strongly support rail-trails, whilst a quarter of respondents said they would be very likely to use a rail-trail. Only 3% of respondents strongly opposed rail-trails (WATCa, 1995). No explanation was given as to why a significant proportion of the community where strongly opposed to rail-trails.

5.2.11 Cycleway & Trail Usage

ISSUE: What are the uses of the path (i.e. recreational, commuting, mixed use) and to what extent are they being used?

Rail-Trail Users

As evidenced at other locations in Melbourne and overseas, rails-with-trails in the urban context attract a wide range of users such as cyclists (recreation, commuting or training), in-line skaters, walkers and joggers, those in wheelchairs and those pushing prams. Unlike

northern hemisphere countries, however, use by skiers and snowmobilers would not be high! In rural and semi-rural areas, horse-riding along rail-trails is undertaken, but tends not to be as popular as cycling and walking unless a specific bridle trail is provided.

Illegal use of trails by motorcyclists can be expected and can be controlled by education, enforcement and the provision of barriers; however the needs of disabled users must be considered when barriers are planned. In the UK, Sustrans has designed barriers which allow cyclists and wheelchair users through but stop motorbikes.

The potential usage of rail-trails, and the types of uses, whether they are on active or disused corridors, will be determined through the interplay of many factors including:

- where they are located (in relation to urban vs. rural environments)
- the population catchment they serve and the destinations they pass
- connectivity to existing bicycle network
- whether there are any adjacent or parallel routes
- the type of trail surface and gradients
- marketing and/or promotion of the facility
- information available and signposting
- the sorts of ancillary facilities provided

As reported by Scotland (1996), Sustrans interest has now broadened to encompass "routes for people", including pedestrians, those with disabilities and horse-riders. A study by Moore et al (1994), found that characteristics important for users of rail-trails were: natural surroundings, quiet settings, safe road crossings, smooth trail surfaces and good maintenance. This is further supported by Sustrans:

> *"a good off-road route will appeal to cyclists of every kind and level of experience, including those who presently do not cycle because of their fear of traffic...it is likely to be popular with a whole range of people including walkers, parents with prams, people in wheelchairs, horse-riders on occasion and children just playing"* (Sustrans, 1994)

Surveys of rail-trails users by Siderelis et al (1994) found that the average age of a rail-trails user was greater than the average age in the US. Not surprisingly the average age of the user decreased with trail length: an average of 50 years old for the shorter (<10km) trails, to an average of 38 years old for the longer trails (over 30km).

Levels of Use

For rails-with-trails, an estimate of potential usage levels for rails-with-trails in the Greater Metropolitan Region could be gained by looking at current levels of use of existing off-road bicycle facilities. However, despite the not inconsiderable effort invested in constructing these facilities, there is still no well documented user data. In Sydney, use of the Como cycleway, Ryde to Botany Bay cycleway and the Sydney Harbour Bridge cycleway can be very high at times (some hundreds per day), however no specific data on the use of these facilities has ever been reported. Anecdotal evidence and observations of cyclists would indicate that rails-with-trails in the Greater Metropolitan Region would attract low to

moderate use during weekdays (in the order of hundreds per day) whilst a prominent and well publicised route which had recreational potential could attract many thousands of users over a summer weekend.

There is good use data on rails-to-trails use in the UK and the US. According to the RTC use of rail-trails will depend on the quality of the conversion. Most of the major rail-trails in the US and the UK have rates of use in excess of one million per year, and are heavily used by all sectors of the community. Over 90 million US citizens use a rail-trail each year (RTC 1996), a rise from the 27 million per year in 1992 as reported by Moore et al (1992). For the 37 rails-with-trails surveyed by Kraich (1996), use (where reported) ranged from a minimum of 18,000 to over 1.5 million per annum. It should be noted that these usage levels are in locations where short sections of trail link major population centres. Apart from say the Meadowbank to Rhodes corridor, it is unlikely that any rail-trails facility in the Greater Metropolitan Region would attract such levels of use.

People living along the corridor can also be major rail-trails users. A study conducted by the US Department of Interior for three rail-trails found that the vast majority of adjoining landowners had visited the trails frequently (Moore et al 1992). This has also been reported for Victoria's Warburton to Lilydale trail, where most of the users live within the adjoining valley/corridor (Warburton-Lilydale Trail Committee, 1996).

Use data for the multi-use trails and walking trails managed by DL&WC and NPWS may give some guide as to potential use of rail-trails in NSW. Some data exist on the use of multi-use trails managed by DL&WC. This indicates that the most popular track, the '6ft Track', a walking track over 42km long from Katoomba to Jenolan Caves has a usage level of between 10-20,000 over a six month period (DL&WC, 1996). Informal observations of trail usage at the well known Newnes to Newnes Junction trail by the NSW National Parks and Wildlife Service indicate that over a weekend there are up to 100 vehicles parked at the trailhead, with many making the 12km walk to Newnes and the Glow Worm tunnels. This would indicate maximum use levels of about 200-300 per weekend, or about 400 per week assuming 3 passengers per car on average and total weekday use about one quarter of the weekend use.

Thus even for the most attractive and heavily used rail-trail in NSW, use would be about one tenth that experienced in the US and UK examples.

5.2.12 Modal Switch Due to Rail-trails

ISSUE: What indications are there as to whether completed bicycle paths are attracting, or are likely to attract cyclists who previously travelled by private car and/or public transport

This is a very complex issue to resolve, and a definite response is difficult to provide. This question should be addressed in the context of decisions affecting overall transport networks rather than applied to facilities in isolation.

Car Dependency

Despite increasing traffic congestion, the high price of purchasing and running a vehicle and the general community awareness of the environmental impacts of private car travel, private car use continues to increase in the Greater Metropolitan Region.

Recent findings of the Clean Air 2000 Monitor of Public Attitudes for the GMR showed that 54% of the population thought it would be difficult to use their cars less. In Sydney's western region this figure was 61% (NRMA, 1996).

This type of dependency is expressed by one commentator: "*motorists also indicate a reluctance to significantly alter travel modes though there is a grudging realisation that changes need to be made"* (Poole, 1996). Vanke also describes the dilemma of car dependency: *"it is clear that the majority of motorists want us (RAC UK) to find ways of addressing the environmental concerns, whilst preserving their own independent mobility"* (Vanke, 1996).

Vanke sees the degree of car dependency as a continuum. Overall there is a range of 10-30% of car trips for which the car is completely and unambiguously necessary. Another 50-70% do not inherently have to be made by car, or made at all, and 5-30% are marginal in every sense. Current trends indicate more car trips in total and fewer of them for which alternatives exist. Therefore Vanke recommends concentrating on the 20% of trips which can be easily moved away from car travel. It is believed in this report that the role of cycling is understated and that of public transport overstated. In the UK cycling and walking are likely to prove a better substitute than does public transport (Vanke, 1996).

In this context it is unlikely that provision of rail-trails will by itself result in any major shift from cars to other modes. However, surveys of cyclists' and non-cyclists' intentions and attitudes reveal that there is scope for change.

Potential for Rail-Trails to Attract Trips from Cars to Bikes

What would attract people from their cars to commute by bike? Responses of cyclists surveyed over the years as to the major disincentives to cycling have been quite varied. When non-cycling Victorians were asked why they did not ride a bike, the responses included: inconvenience, prefer driving, never thought of it, too old and lack of time (SBC, 1987), whilst those who did and did not use their bikes for commuting to work found that rain and traffic were the biggest deterrents (Bicycle Victoria, 1994). Research for the Sydney Bike Plan (Arup, 1990) and the Regional Routes Project (BINSW, 1993) found that the greatest constraints to cycling were traffic, road safety and design constraints. This fear of riding in traffic (and lack of suitable bicycle facilities) is consistently reported as a major factor. Overcoming these concerns by itself, may not be enough to lure commuters from their vehicles.

Research data prepared by McClintock and Cleary in the UK (1994) indicated that providing good cycling facilities tended to encourage more cycling by people already riding, rather than a modal shift. This is also reported by Scotland (1996) where an AA (UK) motorist survey showed that 23% (the highest factor) of people already cycling would cycle more if there were more cycle paths and lanes. This is supported by Katz (1996), who found that

"substantial increases in use could be achieved if bikeways are provided". He calculated elasticities for a number of factors affecting bicycle use for commute trips. The elasticity for provision of cycleways was 0.6, indicating that for every 1% increase in the proportion of a trip served by a cycleway, the likelihood of an individual using a bicycle for that trip increases by 0.6 of a %. This is a very significant elasticity for a variable affecting transport demand, given the wide range of other factors that affect mode choice.

A study by Curtis (1996) in Oxfordshire showed that the increased journey time and costs and inconvenience were the main reasons for not switching to public transport alternatives. Thus strategic links of high quality which avoid detours and are quicker will enhance potential commuting cyclist use. Those with shorter journeys (less than 8km) were most susceptible to change from car trips. This could imply that shorter strategic rail-trail links (say between stations) rather than long lengths parallel to the rail corridor will be relatively more effective. Again the most susceptible to change from cars were those where fear from traffic injury is the major reason for not cycling: *"fear from traffic injury is an important reason why people do not cycle"*(Curtis, 1996).

Special programs to encouraging cycling can have some impact on travel patterns. For instance results from Bicycle Victoria's ride-to-work days, analysed by Rice (1996), suggest that 15% of cyclists who lived within 10km from their workplace (and who made an average of 70% of trips by car), had become regular cyclists since the ride-to-work day.

Providing cyclist-only pathways to stations may promote better access for cyclists, but in most cases these would be used by pedestrians in any case, potentially reducing the overall usefulness for cyclists of better access to stations.

The discussion above suggests there is a measurable latent demand for a switch from car travel to cycling in response to provision of paths. Better quality and more ubiquitous paths will generate a larger switch. Because rail-trails can be very high quality they can contribute substantially to a path network. There are of course many other factors which influence the choice between cycling on-road vs. off-road, but the point is that the great majority of cyclists and especially occasional riders and recreation cyclists prefer off-road facilities as long as these meet the need for directness and lack of conflict with other users.

Rail-Trails and Public Transport

Depending on the manner in which they are developed, there is the potential for rails-with-trails facilities to take passengers away from rail transport. Encouraging NMT at the expense of motorised transport (albeit public transport) fulfils the local Agenda 21 (greenhouse) objectives. However, if the shift is significant enough, the reduced patronage may result in loss of revenue and impact on the economies of scale of a transport system already in place. Studies for the UK DoT by McClintock (1996), showed that where there was targeted funding for Nottingham and York, the major shift was from public transport to bike, and an increased frequency for those already cycling. This work supports a paper by Pharoah (1996), when studying a number of European cities, concluded that most new cycle trips replace public transport rather than car trips (by a factor of about five). An example in Sydney, the proposal for a route along the length of the North Shore Lines from Asquith to North Sydney, has the potential to take away patronage from trains.

The circumstances where it is thought this is more likely to happen are:

- where there is currently less frequent service of trains and trains to major destinations are 'all stations'
- the rail service and rail-trail service the same major destination, which is reasonably close (say less than 6km)
- there are poor end-of-trip facilities for bicycles at stations
- rails-with-trails provide direct routes past stations with grade- separated crossings.

The factors that would mitigate against rail-trails reducing rail patronage are:

- most cycle trips are less than 3km, and certainly less than 10km, whilst rail patronage is greatest for journeys over longer distances
- for many of the rail corridors there are on-road alternatives
- most trips to stations for commuters are by car
- parallel journeys are likely to take far longer by bike (trips over 6km)
- for shorter journeys people would already use a bike.

The consultants do not believe this will be a major problem. For rails-with-trails parallel to the rail line, it is believed that only a very small proportion of cyclists would make the longer commuting journey rather than take a train. For the shorter journeys they would not bother with the inconvenience of dual mode and walk to the station, and for those further from the station they would still drive a car provided park-and-ride facilities were available.

Actions that could be taken to reduce any shift from trains would be to improve secure bike storage at stations, and provide easy and safe access direct to stations and good lighting. In this way any shift away from rail should be more than offset by dual mode to stations and improving pedestrians access.

In summary, it is doubted whether rail-trails would have any measurable net adverse impact on rail patronage. Of more importance is the issue of devoting scarce resources to providing a long distance route parallel to a rail line when there is often an on-road or public transport alternative. This is in effect what is being proposed in Perth, but in that situation the implementation would be far easier and cheaper than in Sydney, and the veloway network is proposed as the major strategic bicycle network.

5.3 Additional issues Identified During the Study

5.3.1 Removal of the Rails and Infrastructure

ISSUE: What are the implications of removing the rails and infrastructure on disused lines, and in what circumstances is this likely to be supported?

Closure of Corridors

Formally closing railway corridors can be a politically sensitive issue. As discussed in Section 4.3, the RAC shall not, unless authorised by an Act of Parliament, close a railway line. The only recent case of a line being closed by Act of Parliament is the Glenreagh - Dorrigo line,

formally closed in December 1993, and now in the process of being sold to a railway preservation group who intend to run tourist trains. More commonly lines are abandoned with no further maintenance being undertaken.

There are strong feelings within country areas of NSW in relation to the cessation of rail services and any moves to formally close a rail corridor. Rural communities are often hopeful (often without good cause) that services some day can be returned on these lines. Formal closure is seen as the loss of the last opportunity for the service to be reestablished. As stated by Brodie, *"The ultimate closure of a railway corridor cuts off any opportunity for perceived future transport needs and disappears forever when disposal takes place"* (Brodie, 1995).

Potential for Conversion of Railway Corridors to Rail-Trails

Despite the sensitivity to formal closure and general opposition to this, there is also an understanding within the community that adaptive re-use is better than a degraded and unmanaged corridor. Brodie found that attitudes to corridor closure are not uniform across the State. His investigations revealed that the attitude against closure is very strong in the southern region of New South Wales, whereas in the northern region of New South Wales it is believed that, with the right approach, corridors to the west of the divide could be closed by an Act of Parliament and adapted for reuse with the support of local Councils and the general population.

In Victoria disused lines have been sold, the government has removed all the infrastructure and lines have been vested in DCNR for conversion to rail-trails where appropriate. In Western Australia corridors have generally remained under the control of Westrail for a period of three years prior to the removal of infrastructure. They have a policy of railbanking versus disposal (Ministerial Task Force, 1995).

It is difficult to make any generalised comments as to which corridors could potentially be formally closed. Even within a corridor there are sections with some potential for use by train preservation societies and Landcare groups, or as rail-trails, road corridors, grazing leases or access ways. Each opportunity must be investigated on a case-by-case basis. Closure of a corridor which has become severely degraded and where the community has appreciated for some time that resumption of rail service is not going to occur is not likely to present a problem.

5.3.2 Interaction Between Rail-Trails and Railway Operations

ISSUE: What are the potential impacts of rail-trails on railway operations?

Running of Trains

The experience in Australia has been that rail-trails have had no adverse impact on the operations or safety of trains. For instance:

- in Melbourne, despite initial reservations, the provision of rails-with-trails alongside Melbourne commuter trains has not resulted in any major incidents (PTC, 1996)
- over a decade of operation of the Sydney Harbour Bridge cycleway passing less than 2m from the CityRail network, there have been no reported incidents to railway operations arising from the cycleway or its proximity to the railway (TSB, 1997)

- the Como cycleway, of which a 500m section is shared with a service track, has been the subject of no reported incidents or adverse impacts on train operations (RAC, 1996).

All of these facilities have some form of fencing or separation from the active line. Fencing should be able to prevent any incidents of trail users affecting train running. This is supported by experience of rails-with-trails in the US: Kraich (1996) found that for the 37 trails investigated, rail authorities had not reported any problems affecting train running.

Maintenance Tasks

There will be locations where corridor space is restricted, or future amplification means that the only practicable alternative available is to have the rail-trail share the service track. This approach has the advantages of:

- generally there will be a level and cleared surface n which to locate the trail
- trail construction costs may be reduced if the service track has a compacted all-weather surface
- as a service access the route is generally free of obstructions
- service tracks usually provide connections to the local road system
- for rails-to-trails in disused corridors, this approach also offers the advantage of providing a well maintained firebreak.

However, this approach is generally not supported by rail authorities *"the idea of sharing the rail corridor with maintenance gangs is not practically acceptable"* (RAC, 1996). Apart from safety issues discussed earlier, concerns which have been raised include:

- **inconvenience** - inconvenience for railway maintenance staff in having to open and close gates when entering or leaving shared sections. This can be reduced by using similarly keyed locks, remote opening gates and ensuring shared sections are kept to a minimum length. This will depend on the frequency and type of maintenance access required. In most cases the use of the shared sections by cyclists and pedestrians will greatly exceed use by maintenance staff. As discussed above, for those rails-with-trails where there is shared maintenance, few difficulties have been experienced.
- **trail damage** - potential liability for damage to trail surface when using heavy machinery. Where a smooth commuter cycleway surface is required, in locations subject to regular maintenance needs, a surface will need to be constructed to cater for expected loads. This may require reinforced concrete. A low-cost solution may be to use highly compacted road base. Although this may not be an ideal surface for cyclists, it is less likely to break up than a thin asphalt surface
- **disruption** - trail use may be disrupted due to major rail closure and upgrades when there is high amount of activity and vehicles. This can be avoided by having a cyclist and pedestrian detours available and trail closure protocol in place. This would ensure that major maintenance and construction activities can take place unimpeded
- **work practices** - shared use of a service track would place greater emphasis on maintenance staff needing to recognise other users in the corridor and to ensure the removal of debris and waste from within the corridor and shared trail.

In the survey by Kraich (1996) of 37 trails within the rail corridor in the US, eight respondents reported minor problems with railway maintenance crews, such as debris being

left on the trail. This reluctance to share sections of the service track is understandable as it leads to the inconvenience of opening and closing gates. However this has been done for the Illawarra line at Como where the cycleway acts as the service track for a section of approx. 500m. Locked gates are placed every 200m for maintenance access. According to contact with SRA and RAC, this situation has not created any major problems for them and works reasonably well.

There will have to be a balance between the degree of intrusion on maintenance activities with the need and benefit for a cycleway. There are positives for the railways: maintenance access could be improved through better surfacing, corridor aesthetics can be improved, and the public can better appreciate the sorts of activities that rail authorities undertake in maintaining and improving the rail system.

Trespass and Vandalism

Trespass onto, and vandalism of property is an ongoing problem for almost any agency with assets in urban areas. Despite security lighting and police enforcement, a high incidence of trespass onto and vandalism of CityRail property continues. Graffiti and vandalism often occur in areas where public access is prohibited or is difficult.

It is possible that rail-trails could in fact reduce levels of vandalism and graffiti by providing a more regular public presence alongside rail infrastructure - and hence a level of deterrence. The cyclone fencing required for rails-with-trails would not make an effective medium for graffiti, however as experienced in some areas of Sydney recently, the pathways themselves may become targets for graffiti (although this does not necessarily detract from or interfere with their use).

Investigation of these sorts of issues was undertaken in relation to three rail-trails by Moore et al. (1992) for the US Parks Service. The trails included a mixture of rural, semi-rural and affluent residential areas. The study found that of the total of 312 landowners adjacent to a rail-trail, 10% of respondents indicated that they had experienced a problem of vandalism with an average annual occurrence of 1.4 times. Trespass was reported as a problem for 19% of the rail-trails, with an average occurrence of 2.6 times per year. Four percent of landowners on average cited burglary as an issue, at an average occurrence of 0.1 times per year (or 0.5% of landowners per annum). An attempt can be made at comparing this situation with data for NSW. Crime data as reported in *NSW Recorded Crime Statistics* (Bureau Crime Statistics and Research, 1995) are:

- **malicious damage to property** - from January to December 1995, a rate of 1,181 incidents recorded per 100,000 population (886 for Lower North Shore to 2,423 for Inner Sydney) Assuming 3 people per dwelling, this equates to one incident for approximately every 4% of properties per annum (or 9% for inner Sydney)
- **breaking and entering dwelling** - from January to December 1995, a rate of 1009 incidents recorded per 100,000 population (558 for Mid-north Coast to 1749 for Inner Sydney). This represents about one incident for every 4% of dwellings per annum (or about 7% for inner Sydney areas).

There were no data available in the US study to compare the incident rates affecting landowners adjacent to the trails with those of the general population. However, there is

enough similarity in the data to suggest that the rates for these incidents alongside rail-trails probably reflect rates generally encountered in the wider community.

5.3.3 Sharing Disused Corridors with Museum Trains

ISSUE: To what extent can museum and tourist trains and rail-trails share disused corridors? If it is not possible to share, who should have preference?

Potential for Sharing Disused Corridors

For half of the disused corridors investigated, there are either active or potential train enthusiast and tourist train groups who have leases over the corridors. A listing of these organisations was provided as Table 3 in section 4.2.5. Response from the consultation process indicates there is a general agreement that rail-trails sharing the corridor within museum trains is possible. In this case the rail-trail would use the parallel service track. This would mean they would effectively be rails-with-trails rather than rails-to-trails apart from the following characteristics:

- lower frequency and speed of trains - thus reduced requirements for fencing etc.
- corridor more open and generally there is a well developed service track/firebreak
- the service track is outside of the formation
- different range of rolling stock including trikes, rail bikes etc.
- the corridor is often unfenced, or if fenced this is to exclude stock rather than trespassers as is the case for the CityRail network

For disused corridors there is potential to complement the existing service by attracting a greater range of users to the corridor and provide an experience additional to riding or walking a trail. Heritage trains could carry cyclists and walkers to this section, resulting in a boost to use of both trains and rail-trail.

The success of a long distance rail-with-trail using a separate service track will depend on:

- **the terrain** - if there are many cuttings and embankments the trail will follow the general surrounds resulting in a trail which would be no different from, say, a fire trail – no advantage is gained in being in the corridor apart from public ownership. For the corridors under investigation in NSW, successful rail-trails will generally be those with attractive scenery. These are likely to also be of interest to tourist railways and are also likely to be the only effective route for a trail through difficult terrain.
- **construction and maintenance needs** - a great deal of work can be required to construct and maintain a trail alongside the rail formation, particularly where there are drainage problems. This the advantages of the rail formation in crossing drainage lines and creeks etc. is lost
- **environmental impacts** - there is far greater potential for trail erosion and thus potential environmental impact. Trail upkeep costs on steeper slopes as the trail follows the formation from embankments to cuttings could be considerable.

Where Rail-Trails & Museum Trains Compete for Use of the Formation
Whether or not the corridor should be used for train enthusiasts when there are competing demands for conversion to rail-trails is a sensitive issue. Ideally what should be sought is a 'win-win' situation, where train enthusiasts operate in conjunction with rail-trails. The main problem occurs where the terrain means that the formation is up on an embankment or within a cutting where a service track may not exist. In this situation it would not be practical to have shared use of the corridor.

A recommendation from the report by Brodie was that *"rail-related re-use should be given preference to other re-use proposals for whole or part of lines"* However, no distinction was made between re-use by enthusiasts, versus railway re-use. Given that the overall intent of railways in the first instance is to serve a public transport need then use of rail corridors for a limited sectional interest, eg. as recreation or hobby pursuit, must be measured against alternative overall community benefits. Rail authorities, DoT, and the community will need to work out the preferred approach in such cases.

Apart from the possible continued maintenance/preservation of rail infrastructure for potential re-activation, there appears to be no inherent reason why train enthusiasts should have first preference for corridor use. Open expressions of interest should be developed and encouraged for a wide range of possible adaptive reuses, with the most appropriate and (to the community) acceptable proposals selected.

Rather than piecemeal development of trails, the consultant believes that there is need for transparency in recognising which corridors offer a high potential as rail-trails and where a quality trail can only really be built over the formation (i.e. a "true" rail-to-trail). It also needs to be recognised where there is a viable proposition for a tourist train as opposed to a hobby train for enthusiasts supported by public funds. The consultants do not believe that a poorly used and compromised recreational 'rail-with-trail' that does not have appeal or will not be widely used is worth the investment of limited public resources.

5.3.4 Impact on Adjoining Landholders

ISSUE: What are the impacts on adjoining landholders from rail-trails and what are their attitudes to rail-trails?

Potential Impacts of Rail-Trails on Adjoining Landholders
Experience with rail-trail projects overseas, especially in the case of the RTC in the US, is that some proposed rail-trails are stalled in their early stages because of opposition by a few vocal residents, especially when they are well-connected to elected officials or community power bases. The potential impact a rail-trail may have on adjoining landholders has also been raised as an issue in consultation during this study and in relation to other Australian rail-trail projects. The sorts of landholder issues which are discussed in the literature and have been raised by the public in relation to rail-trails include:

- **increased access for offenders:** increase in trespassers, crime and vandalism because of an influx of outsiders passing near their home or property
- **increased fire risk:** potential for increased bushfires
- **litter:** litter being left on the trail

- **land ownership:** landowners think they own the land
- **loss of privacy:** overlooking of adjoining property
- **illegal vehicles:** especially motorbikes using the rail-trails
- **feral animals and disease:** fear of increased spread of animal diseases
- **disturbance to stock:** by dogs and trail users
- **reduced property value:** falling house and land prices

Despite these concerns, the general consensus from the surveys and research conducted to date is that initial fears and concerns such as those raised above have not been borne out in practice. In the absence of local information, the Trailswest Taskforce undertook research of landowners adjacent to the Mundaring rail-trail, and the Margaret River-Cowarumup Trail. The survey confirmed WATC findings that public support for recreation trails is high throughout the community following their provision, even among landowners who live adjacent to the trails. The investigations by Trailswest concluded that *"research demonstrates that prior fears held by adjacent landowners are largely unfounded"* and that *"life alongside a rail-trail is better than alongside an abandoned railway reserve"* (Ministerial Task Force, 1995)

In Victoria, DCNR found that all of the adjoining landholder issues could be resolved and were no major problem. They are currently studying whether there is an increased incidence of fire risk as a result of rail-trails. They have found that it is better to have a well maintained rail-trail than a derelict corridor (DCNR, 1996).

← *Upfield Bikeway, Melbourne, as it approaches Brunswick Rd. level crossing. near Jewell Station. The shared pedestrian/cycleway is tightly constrained as it passes between the station buildings and the fences of adjoining properties.*

Photo: Mark Plummer, ART

A detailed study by the National Parks Service in conjunction with Pennsylvania University of three rail-trails found that *"overall trail neighbours had experienced relatively few problems as a result of the trails during the last 12 months....living near the trails was better than they had expected it to be"* Most experience shows that avid opponents of trails are often the greatest users of them once they are constructed (Moore et al, 1992).

A study conducted by the Countryside Commission (in Platt, 1991) showed that only 6% of farmers thought that there should be more public access in the countryside, while 71% complained that trespass, vandalism, and damage to livestock and crops were a problem. Nonetheless on the issue of trespass, the UK DoT report on disused lines in the UK (UK DoT, 1982) felt that a defined, well marked and well used pathway reduced rather than increased the incidence of unintentional trespass. It must be remembered that in the UK, unlike in Australia, the public has access to designated (but unfenced) rights-of-way across farms. Intentional trespass can be discouraged by impenetrable lineside vegetation, and by fence maintenance. A higher level of use by the public on rail-trails was also thought to be some deterrent to theft. It is argued that rail-trails give to derelict land a use for which it will be managed constructively so that illegal rubbish dumping is controlled, litter is reduced and fencing is maintained in stock-proof condition.

Reducing Potential Landowner Conflict

The RTC in its publication *'Secrets of Successful Rail-Trails'* (Ryan, 1993), suggests that proponents take the initiative from the outset and inform adjacent residents about the trail project, listen to their concerns and keep them involved in the planning process (Ryan, 1993) Ten points are listed to aid proponents seeking to work with any opposition, with two key ones being: listen to what they are saying, and give adjacent residents a role in the project.

Similarly the Trailswest investigations found that *"A significant portion of the initial phase of the rail-trail process must be focused on resolving issues raised by landowners adjacent to the trail"* Communication and consultation were considered vital to success: landholders must be completely informed and included in the decision-making process (Ministerial Taskforce, 1994).

6 RAIL-TRAIL OPPORTUNITIES IN NSW

6.1 Selecting and Prioritising Rail-Trail Opportunities

6.1.1 Identification Process

Various rail-trail opportunities were identified through a combination of approaches including:

- review of literature discussing previous proposals
- consultation with rail authorities and those with an interest in rail-trails
- consultation with cyclist organisations able to point to opportunities in their local area
- review of information compiled on disused lines within the rail network
- review of bicycle planning and network information

This allowed the consultants to compile a list of potential opportunities which could then be further assessed. In accordance with the brief, only the more readily defined proposals were taken to the stage of detailed investigation. These were then investigated as case studies. All of the opportunities for rail-trails identified during the study were reviewed in terms of the selection criteria presented below.

6.1.2 Setting Priorities

Selection criteria and priorities have been established for both rails-with-trails and rails-to-trails. These are listed prior to each section (6.2.2 and 6.3.2)

As there will no doubt be more opportunities identified than can be completed at once, or with the available funding, priorities need to be set to identify where funding should be provided and action commenced. For both rails-with-trails and rails-to-trails opportunities, factors which indicate a high priority and a good fit with overall project goals were established. These were presented in a draft form to the Bicycle Advisory Council for their comment.

It should be noted that not all of these factors need to be met for an opportunity to be considered a high priority. Some indication of the overall potential benefits and priority for **all** the opportunities was also thought to be helpful in guiding future allocation of resources and determining which require more urgent attention.

For the Victorian DCNR, options for rail-trails depend on:

- likely users and whether there are recreational or tourist activities and facilities nearby
- needs of adjoining landowners including property access
- public liability issues
- existing conditions of railway reserve and railway track bed
- the financial, in-kind and human resources available

- the staging of development (DCNR, 1994a)

The need to prioritise and direct limited funds to maximum benefit was recognised in developing Melbourne's Principal bicycle network. The fundamental need for a space to ride, smooth surface, speed maintenance and connectivity was identified (Cumming, 1996). Priority links connected areas with high population densities, existing high bicycle-using and regional centres, and centres with high employment densities. A trip length of 7km was taken as the average cycling catchment area for each destination zone. An important point referred to by Cummings was that routes need to grow as a network.

6.2 Rails-with-Trails Opportunities to Enhance Utility Cycling

Rails-with-trails are particularly suited to enhancing utility cycling. They are attractive because they provide a separated bicycle way relatively free of motorised traffic and characterised by excellent grades for cycling by all categories of cyclist. They are generally along important links between trip producers (residential areas) and trip attractors (shopping, education, and employment centres).

6.2.1 Scope of Investigation

It was initially considered that the main potential for rails-with-trails to enhance utility cycling lay in the GMR. However, it became clear during the study investigations and from consultation with local cyclist groups (BUGs) that rail corridors passing through rural population centres may also provide safe and convenient commuting opportunities. Although bicycle networks have been identified for most of these towns (refer RTA Bicycle Network Studies, 1996), and roads within these towns carry lower traffic volumes, they often have relatively higher vehicle speeds and poor road conditions. These two factors are thought to inhibit full potential for cycle commuting in the Central Western NSW towns under investigation for bicycle demonstration projects (Cycle Planing, 1996).

There are likely to be more rails-with-trails opportunities in NSW than were able to be identified during this study as only those towns with Bicycle User Groups were contacted directly. In due course these further opportunities should be investigated.

6.2.2 Criteria for Setting Priorities

For rails-with-trails opportunities, the criteria which indicate a high priority were established as:

- **strategic value:** includes sections that are short (less than two rail stations); completes missing links for the identified State, Regional or Sub-Regional Cycle network; and existing road access is unsafe or unattractive.
- **users:** provides connections for wide range of users (including those with disabilities)
- **catchment and destination:** provides links through, or encourages trips to/from, a regional population catchment. Provides access to a destination of regional/state significance such as the Homebush Bay Olympic site, university or a regional CBD
- **integration:** provides improved access to public transport facilities

- **urgency:** requires urgent action to secure the corridor or infrastructure and/or to complement other developments
- **feasibility:** can be constructed relatively easily with minimal impact on rail operations or assets, and can be constructed generally within the existing corridor
- **environment:** fulfils key planning strategies/policies for location and has minimal environmental constraints

6.2.3 Rail-with-Trails as Part of the Transport Network

Integrated Transport Strategy
As discussed at section 5.2.4, the identification and development of rails-with-trails opportunities should reflect integrated transport strategy objectives for the Greater Metropolitan Region.

The role of non-motorised transport in an integrated transport network is recognised in the US through ISTEA funding criteria. The broad selection criteria for ISTEA transportation funding projects are for those projects which:

- are located in an urban or semi-urban environment
- provide a reasonably direct connection for bicyclists to schools, employment centres and transit transfer stations, and
- serve as an alternate means to the motor vehicle

It is noted that the criteria for directness as described above allows for deviations where the road alternative is unsafe (Jones, 1994).

Road and Bicycle Network Planning
Identification and development of rails-with-trails opportunities must also be considered in the context of the identified bicycle network and major road proposals which make provision for cyclists. In developing rails-with-trails opportunities, the consultants refereed to the following sources of information:

- **RTA network maps -** for the Greater Metropolitan Region and major rural centres as part of the revised NSW Bikeplan (RTA, 1996). The mapping prepared by consultants to the RTA (Arup, 1996) shows all of the identified bicycle network routes completed to date, and any proposed routes.

- **Regional Routes mapping -** draft regional routes network for Sydney prepared for the RTA by a consultant team from the Bicycle Institute of NSW during 1992-1993 (BINSW, 1992; BINSW, 1993). This study prepared with cyclists input provided strategic information on cyclist desire lines and optimised routes using mainly arterial roads supplemented with local roads and off-road sections where required. A number of routes were identified which parallel railway lines. These were chosen as they had few cross streets, with those streets crossing the rail line often being signalised and with good grades. Dual mode opportunity could also be maximised. The approach put forward for these routes was to create additional road space using railway land to provide dedicated bike lanes.

- **Bike Plans -** updated local council bike plans have been prepared for most LGAs in NSW. Some of these have already proposed cycleways within the rail corridor, whilst others propose routes on-road which parallel a corridor. These sources of information were also useful in assessing priority and strategic value.

- **Bike Maps -** maps such as *Sydney Bike Map for Keen Cyclists* (RTA, 1990), *Cycle Sydney* (Bicycle NSW, 1995) assisted in identifying stress levels for on-road alternatives and where strategic links would be useful to connect low-stress routes.

Although the potential use of the rail corridor for cycleways has been recognised in the past, very little bike planning to date at the local level has identified specific routes. Thus local networks already planned and implemented could be enhanced by the retrofitting of additional links not contemplated when they were first prepared.

Rail Corridor Planning
As well as integrating with road transport planning, there was a need to establish network planning for the rail system. This included reference to:

- the State Rail Strategic Plan 1994-2016: CityRail (SRA, 1994)
- CityRail's station upgrading and redevelopment planning
- proposed rail amplification program identified by RAC
- major rail projects including the Olympic Rail Loop and the New Southern Railway
- DoT bicycle lockers program for CityRail stations and ferry wharves (refer Faber & Wyatt, 1996)

This information was used: in identifying those locations where opportunities may be presented during upgrade works; in undertaking feasibility assessment and in ensuring that linkages to transport nodes are maximised.

6.2.4 Potential Rail-with-Trails Identified

A total of 28 rails-with-trails opportunities were identified. These are summarised in **Table 5** below, along with a summary of key constraints and a subjective assessment of priority and recommendations for further action. Priority ratings at this stage relate to strategic usefulness rather than ease of implementation, and are defined as:

High - fulfil a number of the priority criteria and would provide a facility of regional significance

Moderate to High - fulfil at least two priority selection criteria and have sub-regional significance

Moderate - fulfil one or more selection criteria and are locally important

Low to Moderate - as for moderate but alternatives are available and/or there are conflicting priorities

Table 5 - Rails-with-Trails Opportunities

OPPORTUNITY FOR A RAIL-WITH-TRAIL	ISSUES & CONSTRAINTS	PRIORITY & RECOMMENDED FURTHER ACTION
Main Southern Line		
Yennora-Fairfield (700m) Within the western (up) side of the corridor, connecting low-stress on-road routes between Military Rd and Pine Road with an on-road section using Nelson Rd.	- no amplification proposals at present - quadruplication may be necessary in 20-plus years - at-grade crossing of two rail sidings required	- **Moderate priority** at local level, links missing section of RTA bicycle network between Guildford and Fairfield Heights
Cabramatta-Warwick Farm (200m) Provide bridge over Cabramatta Ck. alongside railway viaduct to connect Railway Pde. with Warwick Farm Recreation Reserve	- requires bridged crossing of Cabramatta Ck. - lies on border between Fairfield and Liverpool Councils - flood levels	- **Moderate to High priority** as short strategic connection to avoid lengthy detour or using Hume Hwy. or Cumberland Hwy. - liaison between Councils required
Ingleburn to Minto (1.3km) Cycleway along east (down) side of corridor; from Ingleburn Rd. Ingleburn to Memphis St. Minto	- Very High Speed Train (VHST) project and CityRail needs: potential quadruplication by early next decade; additional tracks either side of existing thus narrowing corridor - Bow Bowing Creek	- **Low to Moderate priority** as alternate on-road network (feeder roads and F3) poor quality for cyclists, and provides off-road connection between sub-regions
Campbelltown to Macarthur (100m) Shared pedestrian/cycleway east (down) side; from end Menangle Rd to Hurley St alongside Camden Rd. reserve. Alternative route along disused section of Camden Rd. to Hurley St.	- sufficient clearance at overbridge if VHST project or quadruplication proceeds - access through fenced area at rear of Campbelltown Library	- **Moderate to high priority** as more direct alternate to major road crossings - potential to link with bike lane on Hurley Rd. (lane width adjustment)
Burradoo to Berrima Junction (2km) Shared cycleway/pathway on east (down) side or corridor, between Wingecarribee R. and McCourt Rd. Moss Vale	- VHST project - minor deviation proposed on down side vicinity of Wingecarribee River extending outside corridor - no major constraints through to McCourt Rd, Moss Vale	- **Moderate to High priority** local potential for off-road alternative; adds to recreation & tourism value - construct now then upgrade on new alignment in conjunction with VHST proposal
Wagga Wagga to Kapooka (2km) East (down) side of corridor, from Glenfield Park estate to Kapooka Army base turnoff. Cross over railway at Olympic Hwy. overbridge	- no major difficulties envisaged re rail corridor - suitable crossing of railway using road bridge not yet resolved	- **Moderate to High priority** sub-regional use for commuting; unsafe on-road alternative less direct. - develop concept in conjunction with WWCC and Army Base

OPPORTUNITY FOR A RAIL-WITH-TRAIL	ISSUES & CONSTRAINTS	PRIORITY & RECOMMENDED FURTHER ACTION
East Hills Line		
North Arncliffe to Bardwell Park (2.5km) On the north (up) side of corridor Potential to extend to Bexley North to link with western tunnel portal M5 East to Tempe. Potential for link to Princes Hwy. via North Arncliffe station Nominated as alternative to M5 East tunnel. Potential to combine with proposed Wolli Regional Park pathways and access, and Nth. Arncliffe development.	- East Hills amplification scheduled mid 97; additional track either side. - pinch points at sewer main, Bardwell Ck., Turrella Station and where close to Wolli Creek - shared use of service track may be required for sections	- **High priority** for sub-regional commuting link - no suitable on-road alternatives (inc. M5 East) - develop co-ordinated concept in conjunction with rail amplification, M5 East, Regional Park and North Arncliffe Station **Refer Case Study No.1**
Holsworthy to Glenfield (3km) Cycleway along northern side of corridor connecting Heathcote Rd. with Moorebank Ave., with connections to Wattle Grove residential area	- VHST project and quadruplication within 10 years - crossing of siding to military reserve	- **Moderate priority** as enables low-stress link from East Hills and Wattle Grove to Glenfield
Main Northern Line		
Rhodes to Meadowbank (1.3km) East (up) side of corridor, using heritage listed disused rail bridge over Parramatta River, through to station within the excavated formation, with an alternate access along edge of corridor to Railway Road. Continuation on east (up) side of corridor from Meadowbank station to feed into Hermitage Road via rail access road. This would then connect to Macquarie sub-regional on-road network	- possible quadruplication in the very long term, 20-30+ years - 20m section of corridor midway between bridge and station may require widening by 2-3m - heritage requirements for adaptive re-use of bridge - shared use of service track - ownership and liability issues for disused bridge - existing cycleway over Concord Rd. bridge	- **High priority** in sub-region. Links with Macquarie sub-regional network and prime recreation and commuting link and utilises a major disused infrastructure item - maximum benefit gained for option to Meadowbank station. **Refer Case Study No.2**
Hornsby to Asquith (2km) Within corridor. Provides alternative to Pacific Hwy. sealed shoulder route (which is currently below standard but there are proposals for upgrade)	- possible quadruplication in the near future (time frame not known) - corridor constrained by overbridges - security at marshalling yards	- **Moderate priority** for local access to stations and alternative to Hwy., but significant constraints - options may include rail-with-trail in conjunction with local streets
Adamstown (300m) Adamstown station to Northcott Dr. to connect Adamstown to Belmont disused line to north - south cycleway	- no major constraints envisaged	- **Moderate to High priority** as short strategic link between networks

OPPORTUNITY FOR A RAIL-WITH-TRAIL	ISSUES & CONSTRAINTS	PRIORITY & RECOMMENDED FURTHER ACTION
Waratah to Hanbury (500m) South (down) side of corridor, vicinity Maud St. overbridge. Access from existing route Prince St. passing under Maud St. to connect with proposed University East Cycleway.	- no expansion planned. - pinch point requires shared use of service track for 200m - stability at bridge abutments and removal of a row of gabions - rock falls at embankment - purchase of land parcel for improved access	**- High priority** as links regional destinations, wide and ongoing community support and proposed on-road alternative unsafe - urgent decision required to integrate with current cycleway work **Refer Case Study No.3**
Coffs Harbour (200m) Vicinity Coffs Creek addition of cycleway to rail bridge	- no major constraints envisaged - reasonably high cost for cantilever addition to bridge - may require shielding from passing trains	- **Moderate priority** - locally important connection for short section avoids Pacific Hwy. - develop in conjunction with connecting routes
North Shore Line		
Milsons Point Station (500m) Provide continuation to SHB cycleway by cantilever structure to western (down) side of bridge abutments. Potential for extension to Blue St. by continuing over Lavender St, then pass under the railway (through workshops) up into car park adjacent to North Sydney station	- heritage and aesthetic constraints of attaching structure to SHB approaches - no major rail corridor upgrade constraints - impact on lease of workshops for extended proposal	**- High priority** as provides more useful connection to heavily used route - proceed to concept once funding sources are identified - investigate potential for extension
Waverton Shunting line (1.5km) Waverton Station to Lavender Bay. Use of unused capacity from Woolcot St. to Waverton station. Use to Lavender Bay subject to line closure	- assumes additional storage capacity made available elsewhere	- **Low to Moderate priority** for local connection Waverton to Milsons Pt
Waverton to St Leonards (2km) Using spare capacity within corridor	- constrictions at road crossings and at two tunnels Waverton to Wollstonecraft - spare capacity in corridor may be used for storage if Lavender Bay sold off	- **Moderate priority** for Wollstonecraft-St Leonards in conjunction with on-road route - develop in conjunction with local bike network
St Leonards to Chatswood (3.2km) Develop in combination with on-road, local pathways on east (up) side from St Leonards to Artarmon, then widening of existing footpath Mowbray Rd. to Albert St. Chatswood	- quadruplication in the medium-long term (down side to Artarmon then up side to Chatswood) - proposed high rise & St Leonards station redevelopment - Gore Hill Freeway - Brandt St. to Nelson St. constrained by overbridges and cuttings	**- Moderate to High priority** as links two important centres and provides alternative to heavily trafficked roads - implementation depends on potential rail corridor upgrade - investigate composite route using local streets and pathways

OPPORTUNITY FOR A RAIL-WITH-TRAIL	ISSUES & CONSTRAINTS	PRIORITY & RECOMMENDED FURTHER ACTION
Gordon to Turramurra (4km) Alternative to Pacific Hwy., providing improved and safer access to stations and schools. Provision of shared cycleway/pathway within eastern (up) corridor from Werona Ave. Gordon to Walton Cl. Pymble utilising Mona Vale Rd. underbridge, then Grandview St. to Pymble station. From Pymble to Turramurra from Avon Rd. along western (down) side of corridor to Turramurra station	- no plans for quadruplication in the medium to long term - constrained corridor and generally unsuitable terrain, - vegetation clearance - high cost for bridging/major engineering structures - potential for disruption during construction	- **Moderate to High priority** for section due to poor road alternatives and hilly terrain for local street network - priority is to improve access to, rather than past, stations - engineering study required to determine feasibility
Western Line		
Stanmore to Petersham (200m) Vicinity Crystal St. linking Gordon Cres. with Terminus St. including subway through Crystal St. overbridge abutments on northern (up) side of corridor	- steep embankment would require retaining walls - feasibility of constructing subway through overbridge abutment	- **Moderate priority** if linked to regional network - review engineering feasibility of subway
Lewisham to Summer Hill (400m) Grosvenor Cres. to Lewisham Stn. including link to Hawthorne Canal cycle route northern (up) side of corridor. On-road alternatives truck route uphill and narrow road - no possibility for road widening, or back street and footpath route (not practical)	- requires purchase of land from rear of residential property at Lewisham station - impact on maintenance access ramp - cantilever off underbridge at Canterbury Road - crossing of goods line at grade	- **Moderate to High priority** as potential to connect two major on-road routes - major constraints to be overcome - integrate with development of inner west bicycle network
Harris Park 'Y' Link (400m) From Crescent St. Granville to Tottenham St. Harris Park, by attachment to rail bridges and use of shared footpath. Previous proposal was to include route with rail development, but this is now unlikely to be feasible	- refer previous investigations - steep embankments on outside of rail corridor - have to travel down and up ramps to and from footpaths	- **Moderate to High priority** - would enable a route in heavily traffic congested area from Holroyd to Parramatta CBD
Westmead to Wentworthville (600m) From Bridge Rd. to Railway Rd. Westmead, by passing under Hawkesbury Rd. on northern (up) side of corridor, or University land to connect with Wentworth Avenue	- no major constraints	- **Moderate to High priority** - enables a route from Blacktown area to Parramatta CBD - liaise with University of Western Sydney
***Seven Hills Station:(*200m)** Terminus Rd to Hartley Rd on northern (up) side of corridor then to International Park	-recent roadworks (pylons for new road crossing) constrain corridor	- **Moderate priority** - short section connects suburbs

Illawarra Line		
Kings Cross-Domain viaduct (450m) A veloway providing a grade- separated route from McElhone St. Woollomooloo to the Domain and Art Gallery Rd. Would involve suspending a lightweight structure from the viaduct.	- clearance from buildings - land ownership below the viaduct - aesthetics and visual impact - overlooking property - personal safety for cyclists	- **Moderate to High priority** as it removes topographic and traffic (Palmer St.) constraints and links a main route from Eastern Suburbs to CBD - further study needed
Erskineville to Sydenham (2.6km) Shared cycleway/pathway along constructed but unused formation on west (up) side of corridor from Erskineville Road to Sydenham station - linking Burren St and Henderson Road with on-road route and Cooks River,	- possible constrictions at road overbridges (bricked abutments in place but no spans provided) - confirm no future requirements by RAC - issue of privacy of adjoining residences	- **Moderate to High priority** as expected high local use, links to potential sub-regional network - investigate feasibility of re-establishing access through overbridges
Allawah to Hurstville (600m) From existing cycleway at Kempt Field alongside corridor on northern (up) side, over Hill St (using an existing disused rail bridge) to Hurstville station. Creating an opening in station walling could bring cycleway directly into Hurstville Mall near war memorial.	- no proposals for track amplification - separation from CityRail station area - possible need to purchase strip of industrial property west of Kemp Field	- **Moderate to High priority** as greatly improves sub-regional access to major station and shopping precinct, uses disused infrastructure, poor on-road alternatives
Coniston to Unanderra (4km) A veloway within the northern (up) side of the rail corridor , from O'Donnell Drive Unanderra passing under F6 Freeway and Masters Rd overbridges to Gladstone Ave. Mount Saint Thomas, to link the expanding residential area to the South west of Wollongong with on-road routes leading to the CBD.	- funding - no proposals for track amplification - clearance to abutments of F6 and Masters Rd overbridges to be confirmed	- **High priority** as best strategic connection in region, poor on-road alternatives, cyclists prohibited on freeway - feasibility to be confirmed - concept plan yet to be developed by RTA/Council
Sydenham-Botany Goods Line		
Marrickville to Sydenham (300m) Shared cycleway/pathway within corridor and utilising additional capacity at bridges. Priority sections are Fraser Park to Alexandra Canal,	- being investigated for rail duplication in the medium term (5 - 10 years) - land use at Sydney Haulage Terminal area - constrained corridor at Princes Hwy. overbridge	- **Moderate priority** as other parts of network yet to be constructed, but would provide good east-to-west connection - include with Alexandra canal planning
White Bay Goods Line		
Leichhardt (200m) Use of Victoria Rd underpass: to provide grade separated connection between Lilyfield and Rozelle. Also pathway along eastern side of corridor to link Brown and Beeson Sts to Kegworth St. Leichhardt to provide access to existing Hawthorn Canal cycle route	- possible light rail use - constrained corridor - adjoining landholders concerns regarding privacy	- **Moderate priority** as both relatively short sections linking sub-regional areas and avoiding major roads - review works at Victoria Rd overbridge

OPPORTUNITY FOR A RAIL-WITH-TRAIL	ISSUES & CONSTRAINTS	PRIORITY & RECOMMENDED FURTHER ACTION
Leeton to Hillston		
Griffith Township (approx. 2km) A shared cycleway and pedestrian 'boulevard' through built-up area of Griffth, in accordance with local bike plan	- no amplification proposed	**- Low to Moderate priority** as on-road alternatives exist, but would provide good linkage of community with off-road alternative - Council to develop concept further

Discussion of Rails-with-Trails Opportunities

Some proposals put forward during the course of this study called for the construction of 'veloway' style cycleways along the entire length of particular rail corridors, in a similar manner to the proposed Perth network. However, an "ideal" of having veloways parallel to long lengths of active rail corridor in the Greater Metropolitan Region is unlikely to be feasible given the many physical constraints found along metro corridors, such as:

- railway stations, commercial centres, roads and car parks abutting the corridor blocking through access
- road overbridges where there are no extra spans to cater for rails-with-trails
- steep and heavily vegetated terrain reducing available width
- stanchions, power poles and sub-stations necessary for the electrified rail network
- demands placed on available space within corridors for rail amplification and maintenance access

These physical constraints would result in facilities which would have high construction costs, and possibly construction impacts, yet potentially short lives given a higher probability that land would be resumed for railway amplification. These factors are particularly applicable to long lengths of veloway proposed in the inner and northern areas of Sydney, the upper Illawarra, some sections of the Central Coast and the Blue Mountains. The cost of these veloways would be very high in comparison to alternative strategies. This approach would also conflict with an overall objective of not duplicating the longer transport links which public transport can better service for most people. Trips in Sydney are also less concentrated on the CBD compared with Perth. Thus, the Perth Veloway model where cyclists would use the corridor for longer journeys converging on the CBD, with most road crossings at grade, is not as appropriate in the context of the GMR.

Given these factors, it is felt that opportunities for rails-with-trails in the Greater Metropolitan Region should focus on:

- short strategic rails-with-trails connections which will enhance the identified on-road bicycle network
- using infrastructure such as bridges, viaducts and subways to bypass heavily trafficked roads or physical obstacles

- providing improved access to, rather than past, railway stations or other transport nodes, and encouraging dual mode trips
- integrating with other transport and commercial infrastructure projects.

Sydney Metro Area

As shown in Table 5 above, there are many opportunities for rails-with-trails in the Sydney metro area, and it is likely that more will be identified with further study. Layout of the Sydney rail network, and the location of the various case studies are shown in **Figure 8.**

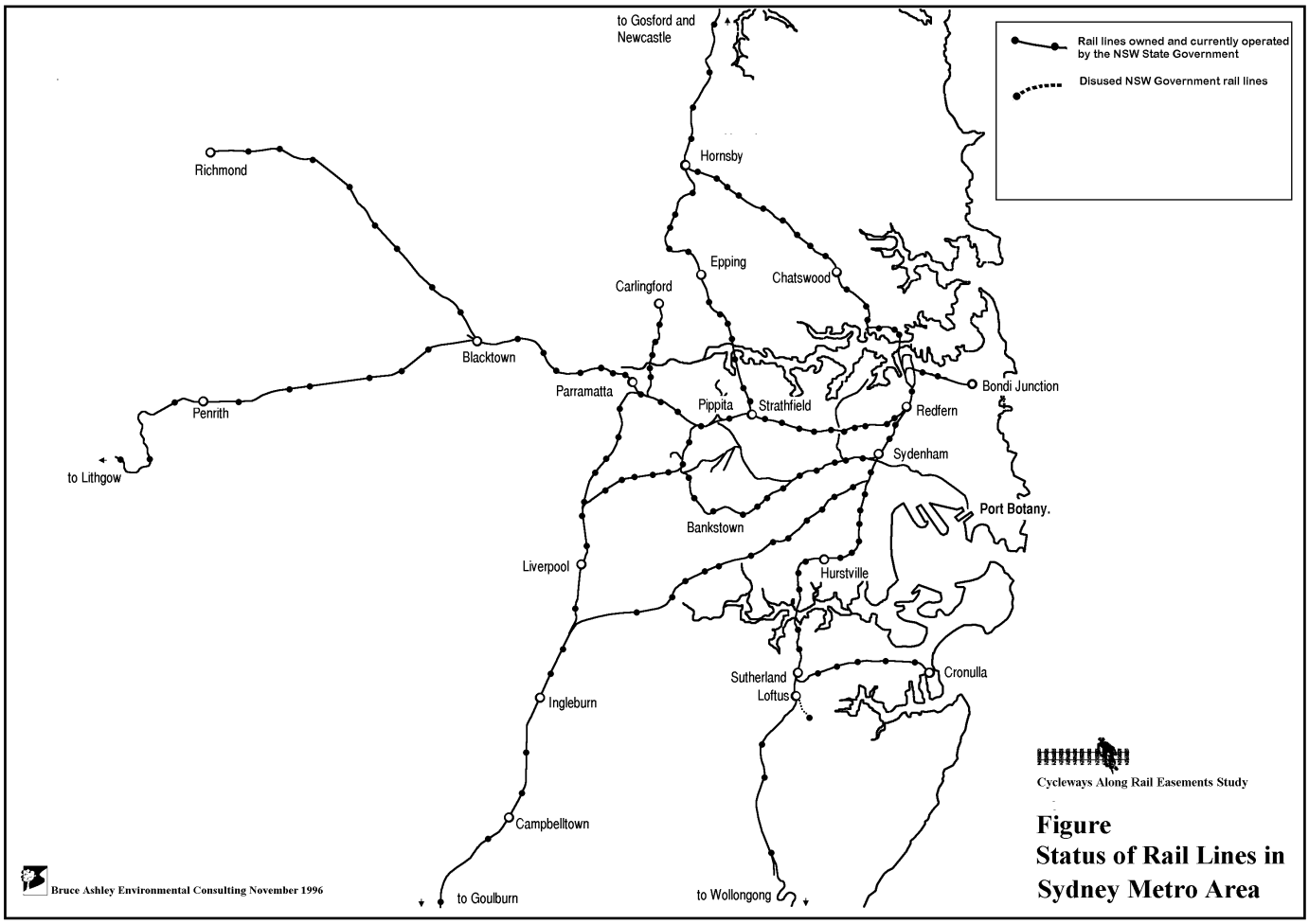

Figure 8 *- Rail Network in the Sydney Metropolitan Area*

It has been established during the consultation process that the Rhodes to Meadowbank corridor and the East Hills Line corridor provide excellent rails-with-trails opportunities, and these have been investigated as case studies. Nonetheless, there are many other opportunities in the Sydney metropolitan area apart from these two case studies which have regional and local strategic significance and are worthy of more detailed investigation following this study. Recommendations relating to these opportunities are given in Section 7.4.

North Shore and Main Northern Lines - development of rails-with-trails along the North Shore Line from Milson's Point to Hornsby and the Main Northern line from Meadowabnk to Asquith has been proposed during consultation for this study. Sections of these corridors where such a proposal could be considered consistent with established selection criteria have been included in Table 5. Construction of cycleways along the length of the Meadowbank-Asquith (15km) and Chatswood-Hornsby (13km) sections of the rail corridors are likely to face a number of major if not insurmountable constraints identified by the RAC. The photograph on p.???68 shows an example of the difficulties which would be encountered in locating a rail-with-trail along the North Shore Line.

Given the focus for rails-with-trails in the Greater Metropolitan Region as discussed earlier, and the relatively high cost of the North Shore and Main Northern Line proposals (possibly in excess of $0.5million per km for some sections), development of a continuous cycleway along the full extent of both corridors is rated by the consultants as a low priority. However, development of shorter links to stations where adequate on-road alternatives do not exist and/or sections providing alternatives to major roads could be designated a higher priority. Although current major infrastructure developments within the Meadowbank-Asquith corridor are nominated as 'constraints' by the RAC, they may in fact provide opportunities for rails-with-trail facilities. This matter should be taken up where appropriate in relation to identified strategic links.

Short Strategic Links - a number of the priority opportunities shown in **Table 5** involve relatively short sections of active line to link with the bicycle network or to greatly improve pedestrian access to stations. Although these shorter sections were not investigated in detail, they would be relatively easy to implement compared to the more extensive proposals detailed in the case studies. It is recommended that these links be included in the planning process following this study concurrently with more detailed investigations of the nominated higher priority proposals.

Goods Lines - both the White Bay and Sydenham to Port Botany Goods Lines could be the location for cycleway links across heavily trafficked industrial areas. However their potential as rails-with-trails locations may depend on future developments in the corridors such as proposed extension of the Pyrmont-Leichhardt light rail, development of land adjacent to Alexandra Canal and potential future amplification of the Sydenham to Port Botany Goods Line. Authorities with responsibility for planning within and adjacent to these two corridors should consider this potential any new development or land management proposals are being addressed.

Future Rail Corridors - a number of new rail corridors have been mooted, such as Chatswood to Epping, Parramatta to Epping and North Sydney to St Leonards. Although a number of these proposals would be located underground, any opportunities for rails-with-trails that would enhance the cycle network should be identified during the detailed planning stage for such projects.

Blue Mountains

Two longer length rails-with-trails proposals have been proposed for the Blue Mountains corridor. The first is a rail-with-trail from Blackheath to Katoomba (14km), developed in sections as an alternative to the Great Western Highway. No detailed concept has been prepared at this stage. Although no amplification is expected of this corridor and the facility would offer much better grades than the Highway, the route is constrained wherever there are road overbridges. This would probably require crossing from one side of corridor to the other. Similarly to North Shore proposals, a continuous rail-with-trail along the entire length of this corridor is of low priority status. However, the development of shorter and easier sections between villages, possibly making use of the maintenance service track where provided is of moderate to high priority. Concepts for priority sections should be developed following this study.

A rail-with-trail from Lithgow to Wallerawang (13km) has been proposed as an alternative to the Highway. Although no amplification is expected and the construction would be feasible, the expected high cost versus low potential use would indicate a low priority. Use of short sections of rail corridor combined with a sealed shoulder bicycle route on the Highway could be investigated.

Lower Hunter and Central Coast

Opportunities for rails-with-trails in the Lower Hunter region were focused on providing connections within the identified strategic cycle network (Newcastle-Lake Macquarie Bike Plan). The key proposal investigated in some detail, and discussed below, is one which would use a section of active rail corridor, and pass under the rail overbridge to avoid an at-grade crossing of Maud St (MR 305), between Waratah and Hanbury. This has been assessed as having high priority. This, combined with the need to resolve a range of site constraints make it suitable for inclusion as a case study as detailed below.

A further key proposal covered in Table 5 has been proposed by the Newcastle Cycleways Movement (NCM). It would use a portion of the active Main Northern Line corridor at Adamstown to provide a connection between the Adamstown to Belmont disused line with the main north-south cycleway which passes Adamnstown Station. Given the limited investigation undertaken to date on this proposal, it has not been possible to determine engineering feasibility or develop a detailed concept. However it is a relatively short section with strategic potential, and should be investigated in further detail by NCC and the RTA as a potential connection to the identified cycleway network.

The layout of the Lower Hunter rail network and location of the various opportunities described are shown in **Figure 9.**

Due to the hilly terrain and narrow, heavily trafficked roads in the southern Newcastle area there may well be other rails-with-trails opportunities along the Main Northern Line not identified in this study.

Adamstown to Belmont Disused Line - this disused corridor, a former privately owned and operated colliery line, is not covered by the study brief as it is now controlled jointly by Newcastle and Lake Macquarie City Councils. The Councils are currently developing a

management plan for the corridor, which has the potential to be developed as a cycleway, with the possible introduction of a light rail or other public transport service.

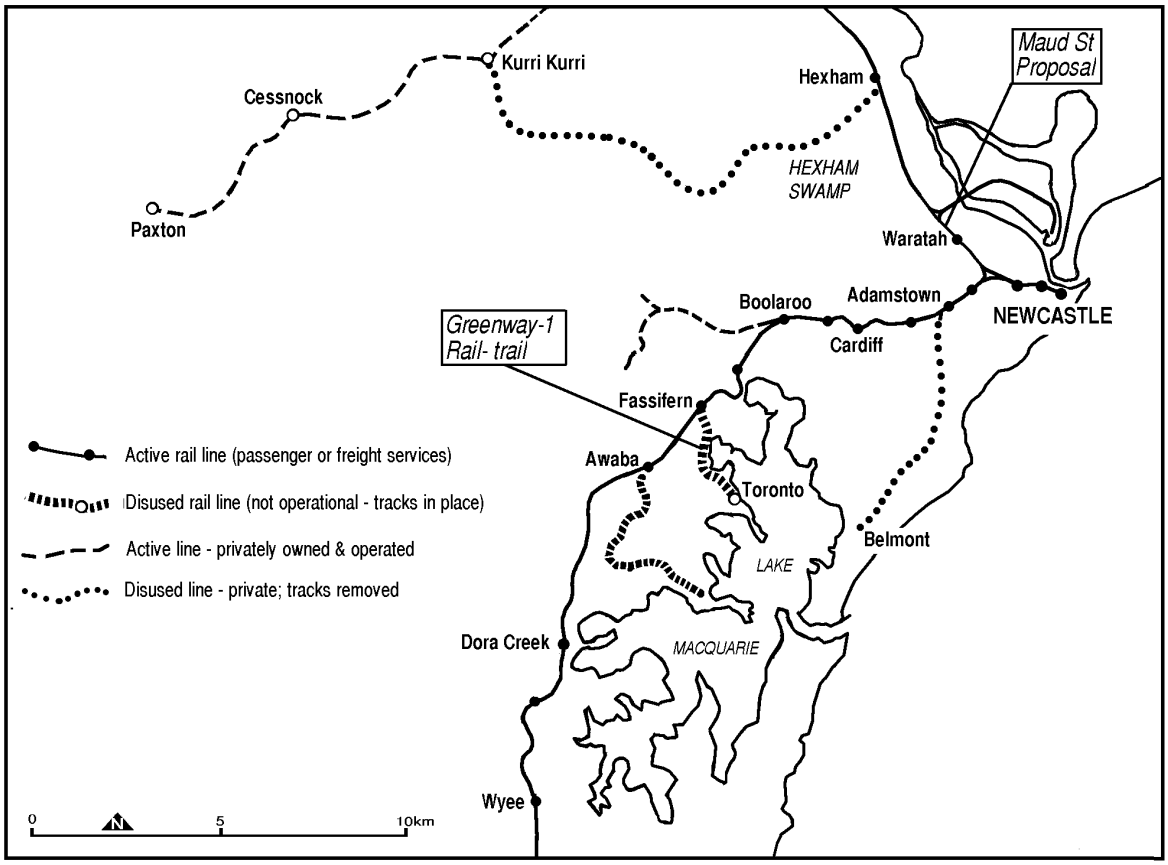

Figure 9 *- Rail Network in the Lower Hunter*

The Illawarra

North of Coalcliff opportunities for rails-with-trails facilities using the Illawarra Line are constrained by the terrain and tunnels. A coastal cycleway has been constructed from Thirroul to Wollongong which is mainly off-road. The facility provides variable levels of service, and can be very congested with pedestrians, particularly at weekends.

The greatest potential for commuting links within the Illawarra region are naturally those closer to Wollongong and Port Kembla. Although a number of mainly on-road routes have been proposed in the City of Wollongong Cycleway Plan (City of Wollongong, 1994), few have been implemented, and in some areas no suitable routes can be identified. A high priority would be to establish a cycleway along the corridor between Coniston and Unanderra as it would service the West Dapto residential growth area. Cyclists are prohibited from using the F6 from North Wollongong south to Albion Park and there are few alternatives that are reasonably direct and have easy grades. There is a proposal to link Dapto High School to Kannahooka Rd. using a disused colliery line. However this project is awaiting funding.

The RTA, local Council and local cyclists rate as a high priority the establishment of a rails-with-trails facility for both commuting and recreation cyclists over the 11km of rail corridor from Kiama to Gerringong. There is no alternative route to the Princes Highway, and to provide an on-road route for cyclists along this section of the highway is not regarded by the RTA as feasible. The main constraints are the terrain adjacent to the formation, the three tunnels between Kiama and Gerrigong which would have to be bypassed, and the high cost of a long length of route. Levels of use are unlikely to justify the expense of this proposal in the short term.

There has been a suggestion from local cyclists for the establishment of a rail-with-trail from Albion Park Rail to Kiama (14km). However there is the possibility of developing an on-road route in conjunction with residential estates planned for Shellharbour, and highway upgrading or deviation. There are proposals to extend the electrified rail network to Kiama which may reduce the available corridor width. Other concerns raised by RAC are: getting past the station yards; crossing the branch line to Bombo Quarry; and the tunnel into Kiama.

The layout of the rail network along the Illawarra (including the Southern Highlands), showing the locations of the opportunities described above, is shown in **Figure 10** opposite.

Rural Centres

Many rural centres, including most larger ones, have rail corridors passing through or close to their commercial districts. High vehicle speeds and poor road edges can make off-road cycle routes attractive for recreation and commuting in rural areas, even if on-road traffic levels are low. Although not specifically included in the brief these opportunities were investigated by firstly reviewing the RTA's Bicycle Network plans and establishing where strategic links could be provided. Opportunities were also identified through a wider consultation process.

Wagga Wagga to Kapooka Army Base - Wagga Wagga is the most populous inland city in NSW, and as such has relatively higher transport demands than other rural centres. Wagga Wagga is currently undergoing residential expansion, with an Army base at Kapooka and the RAAF base at Forest Hill being two significant commuting destinations. There is an opportunity to develop a rail-with-trail using a section of the Main Southern Line corridor, so as to link the residential growth area of Glenfield Park south west of the city with the Kapooka army base, thus avoiding the Olympic Way (Trunk Road 78) which has high traffic speeds and relatively narrow pavement width.

This proposal has support from the local community, Council and staff at the Kapooka Army Base, and should be integrated with negotiations regarding road access to Glenfield Park and current updating of the bicycle plan. A further opportunity of linking Wagga Wagga with Forest Hill using the disused corridor is considered under **Section 6.4.2** below as Case Study No.3 - Wagga Wagga-Tumbarumba disused line.

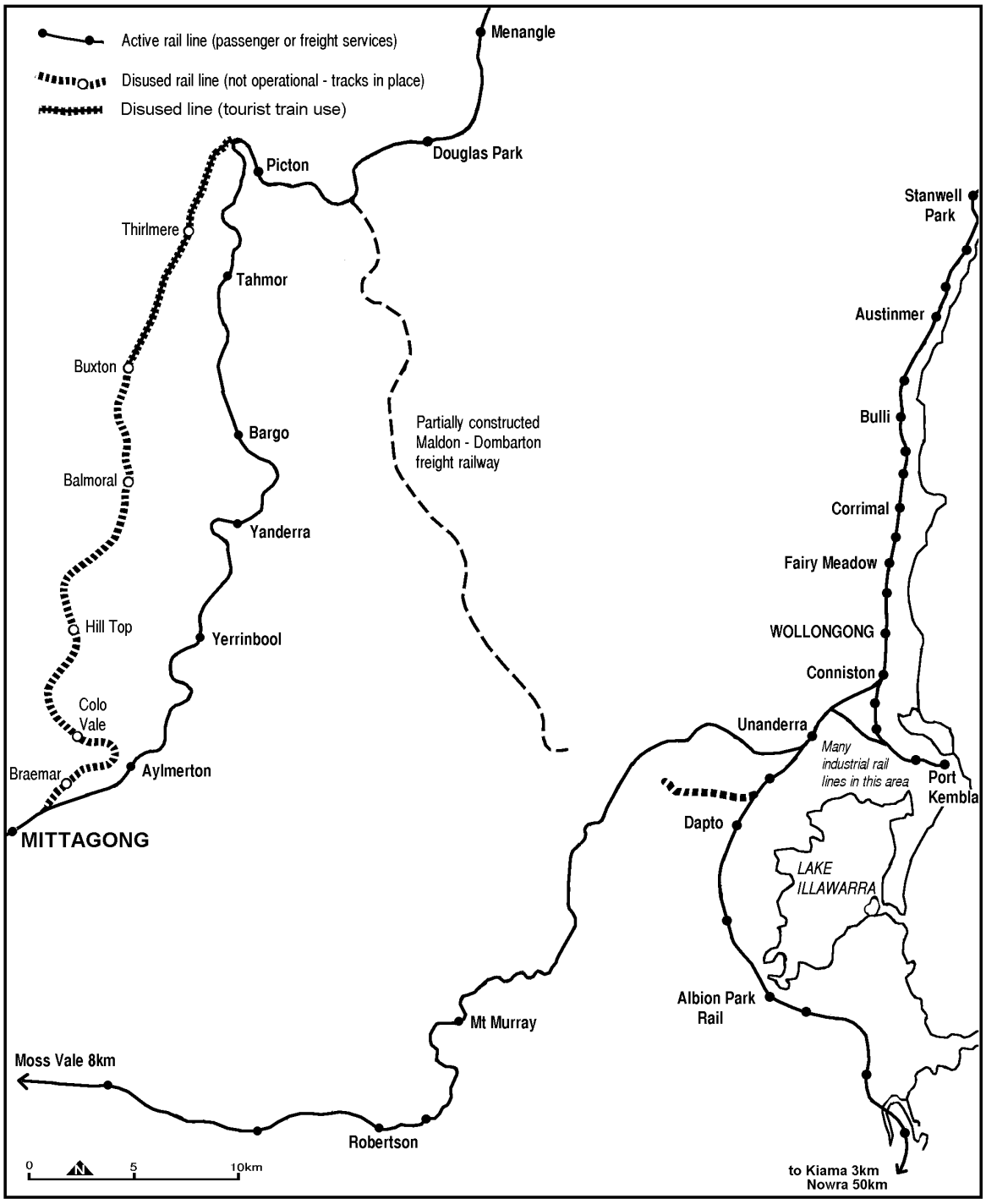

Figure 10 *- Rail Networks in the Illawarra and Southern Highlands*

Other regional centres where opportunities for rails-with-trails exist include:

- **Griffith** - possible cycle pedestrian boulevard through the town centre using the active rail corridor. A 'greening' of the area is proposed for joint bicycle/pedestrian use

- **Grafton** - potential for an off-road crossing of the Clarence River using a structure cantilevered from the double deck rail/road bridge. This would complement the currently proposed rails-with-trail linking the footpath from the southern end of the bridge to the station
- **Coffs Harbour** - local cyclists have proposed a potential addition to the side of the railway bridge crossing Coffs Creek (Main Northern Line) to link the north and south sections of the City. This potential link has not been investigated to date, and RAC has identified no specific constraints regarding the overall concept.

6.2.5 Rails-with-Trails Case Studies

The three high priority rails-with-trails opportunities were further investigated as case studies:

- East Hills Line - North Arncliffe to Bardwell Park (2.5km total length on the 'up' or western side of corridor)
- Northern Line - Rhodes to Meadowbank (1.3km total length on the 'up' or eastern side of corridor)
- Northern Line - Waratah to Hanbury (500m total length on the 'down' or southern side of corridor)

These rails-with-trails opportunities are discussed below.

CASE STUDY NO.1 - East Hills Line: North Arncliffe to Bardwell Park

Background

During the 1994 M5 east EIS studies, alternative routes for cyclists to the proposed M5 East tunnel section were investigated because it was not considered feasible to provide for cyclists within the tunnel (a wider cross-section would have been required) . Alternative proposed routes were investigated and reported in a specialist working paper (Arup, 1994). This study presented a preferred option to locate a cycleway along the northern side of the East Hills Rail corridor from Bexley North to Tempe, to connect with the Cooks River Cycleway. Refer **Figure 11** below for a location map.

Following these investigations, an alternative surface cycleway route was proposed in the M5 East EIS which would be provided through the Wolli Creek Valley adjacent to and on the northern side of the railway line between Bexley North and Turrella. Implementation of the preferred cycleway would require negotiation and agreement between the RTA, SRA and affected Councils, and failing agreement being reached an alternative could be provided which could be along existing roads (Manidis Roberts, 1994)

Response to Selection Criteria

Implementation of a rails-with-trails facility through this constrained section of the Wolli Creek valley would be a tremendous asset regardless of the outcome of the M5 East development. The Wolli Creek valley is the logical route from the upper St. George area to the Cooks River at Tempe and the CBD. However with the M5 East proposal attracting cyclists from the south, some cyclist provision is required to connect the route ending at the tunnel portal with the established bicycle network. Local road alternatives are available but

would require switching from one side of the rail corridor to the other and back again. There are no practical road alternatives from Bardwell Park to Tempe. A route in this location would connect to the Ryde to Botany Bay Cycle Route, the new North Arncliffe station, and provide a regional link between Marrickville and the St. George area. The facility would have commuting and recreation potential. Although it would pass Bardwell Park station it is not likely to compete with existing rail services.

Consultation indicates that the concept would receive strong support from Canterbury and Rockdale Councils, local community groups, and cyclist organisations. The facility would provide good access to the North Arncliffe station currently being constructed and improve pedestrian access to Turrella and Bardwell Park stations.

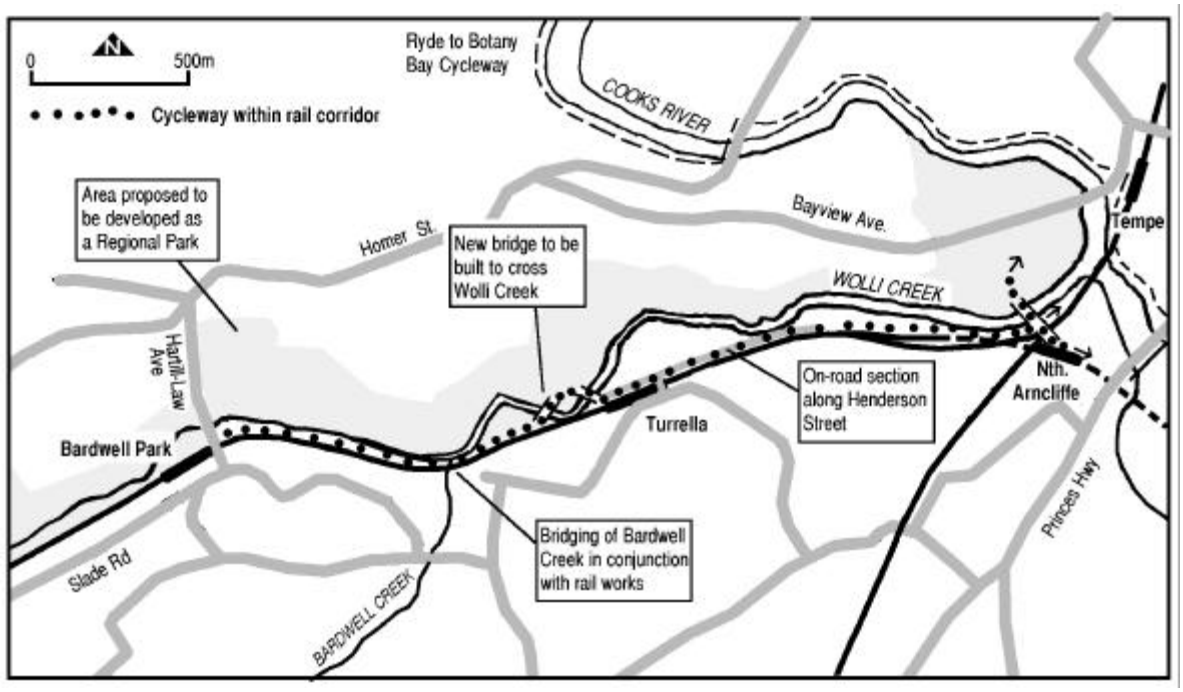

Figure 11 *- General location and concept for rail-with-trail along East Hills Line - North Arncliffe to Bardwell Park*

Issues

- **rail amplification -** Amplification of the East Hills rail line is now to proceed. The works would entail the placement of two additional tracks straddling either side of the existing lines (generally at 6.4m centres). Preliminary design work has been completed (SRA, 1995) and an EIS (Connell Wagner, 1996) has been prepared, exhibited and is currently being assessed. A number of submissions to the EIS supported the development of a cycleway in conjunction with the amplification works. Following EIS approval, detailed design work is to commence, with construction expected to start mid-1997. Therefore urgent action is required to maximise opportunity related to the rail amplification works.

- **M5 East Motorway -** The supplementary EIS for the M5 East proposes a full tunnel route from Bexley North to Marsh Street (Manidis Roberts, 1996). This would prevent the cycle route rejoining the M5 alignment east of Turrella as proposed in the 1994 EIS. This places greater emphasis on providing a cyclist route from the East Hills rail corridor to the existing bicycle network at Tempe.

- **Wolli Regional Park -** there is an 'in-principle' agreement from the relevant Ministers to develop a regional park along the Wolli Creek valley through consolidation of land parcels. Initial discussion indicates that development of a multi-use trail (with sections developed as a rail-with-trail) is likely to be compatible with overall park development

- **North Arncliffe Station -** this is under construction and the surrounding area is being developed as a mixed light-industrial and commercial area. The development offers the opportunity of providing a more direct access to a cyclist crossing of the Cooks River at the Princes Hwy. The key to this access would be a shared cyclist/pedestrian overbridge to connect the station with areas west of the rail corridor and to any cycleway along the Wolli Creek valley. North Arncliffe station will also provide an important opportunity for dual mode bicycle access as it straddles three railway lines

- **sewer main -** the South West Ocean Outfall Sewer (SWOOS) crosses the rail corridor just north of Turrella station and the route will need to either pass over this and continue along the western side of the corridor or follow along it to pass under the rail corridor and connect to Lusty St.

- **watercourses -** the rail corridor is very constrained by Wolli Creek where it crosses Bardwell Creek, and at a location 200m south of Turrella station. These locations would require additional bridging to be constructed to carry the cycleway over these points

- **shared use versus cyclist only** - given a commuting cyclists focus and potential pedestrian conflict, a segregated or cyclist- only facility should be considered

- **on-road sections -** the logical extension of the route would be from Bardwell Park, along the northern (up side) of the rail corridor to Bexley North, connecting to the M5 East tunnel via Kingsford Rd.

Concept

Although the East Hills amplification works will reduce the space available within the corridor, it is still considered feasible and desirable to locate a cycleway within or immediately adjacent to the rail corridor, or a section of it, rather than create a new formation in the valley floor. For some sections of the corridor between Bexley North and Cooks River the SRA boundary extends to the other side of Wolli Creek. The amplification works provide a unique opportunity for cycleway provision to be incorporated into any new bridging structures and major engineering works, thus reducing future additional costs for retrofitting.

Any modification to the current designs for major bridges or retaining structures should be incorporated now, rather than losing the opportunity altogether, or incurring significantly greater costs for retro-fitting of works. This is particularly so for:

- the section Bardwell Park to Turrella where there is no readily available on-road alternative for cyclists
- the proposed new bridge over Bardwell Creek and section of land resumption along the Wolli Creek 200m south of Turrella, critical "squeeze points"
- access bridges from North Arncliffe station west across the rail corridor

A more direct connection to the Cooks River Cycle Route is probably the most appropriate route. This would require the route to use a portion of Henderson Street Turrella, then cross Wolli Creek to link with Bayview Ave. A more direct route to the CBD and proposed future Alexandria Canal route would be over the alignment of the New Southern Railway corridor to Princes Highway then utilising a proposed crossing of the Cooks River over an existing electricity viaduct. This will involve negotiations with Rockdale Council and Integral Energy (the SRA only has an underground easement for the New Southern Railway).

Costs, Funding and Management

As shown in the cost tables in **Appendix 10**, costs are likely to be in the order of $400,000 for a 3m wide concrete shared route. Costs could be reduced depending on the degree to which works can be integrated with rail amplification.

It will be up to the DoT to establish funding responsibilities and budget for the works proposed. Given a commitment by the RTA to develop a route in conjunction with the M5 East, they are likely to be the major funding source for development of an alternate route either within/alongside the rail corridor or sections of it. However the facility is also likely to be used by pedestrians; thus funding could come from a range of RTA and/or local council sources to provide community access, rather than purely from the RTA bicycle budget. If funding is to come mainly out of the RTA bicycle budget, then it would be appropriate for the facility to be constructed as a cyclists-only rail-trail.

A key priority in the first instance would be to ensure that all bridges and other structures, built as part of the rail amplification, are designed wherever possible so as to accommodate a cycle route, even if the cycleway is to be constructed at a later date.

CASE STUDY NO.2: Main Northern Line - Rhodes to Meadowbank (using Disused Meadowbank Railway Bridge)

Background

The disused Meadowbank railway bridge was opened in 1885 and is one of only 12 iron lattice bridges in NSW. The bridge was upgraded in 1927 and a second bridge, the John Whitton Railway Bridge, was completed in 1980. The SRA has identified the old bridge as surplus to requirements. A conservation study prepared for the bridge by consultants Sinclair Knight Mertz (1996), included assessment of cycleway options.

The old bridge is listed on the National Trust register and the Parramatta River landscape is listed on the register of the National Estate. Whilst the SRA is not legally bound by these listings, it is keen to avoid the need to dismantle the bridge and is prepared to consider proposals for its future (letter SRA to DoT, 1996). It is understood that State Rail is considering removing some of the later additions to the bridge in order to expose more of the original design (Sinclair Knight Mertz, 1996).

Response to Selection Criteria

The route would provide a valuable link between the Parramatta Valley Cycleway and Bicentennial Park/Sydney Olympic Park. Residents of the Rhodes / Concord peninsula would be able to use the bridge to gain access to the new Meadowbank ferry wharf/bus interchange and Meadowbank TAFE, as well as to the Parramtta Valley Cycleway and cycle routes further north. The alternative crossing for cyclists is the existing Concord Road bridge, but this requires a 1-2km detour through a number of local streets and a difficult at-grade road crossing at that bridge's northern end. Refer to **Figure 12** location map below.

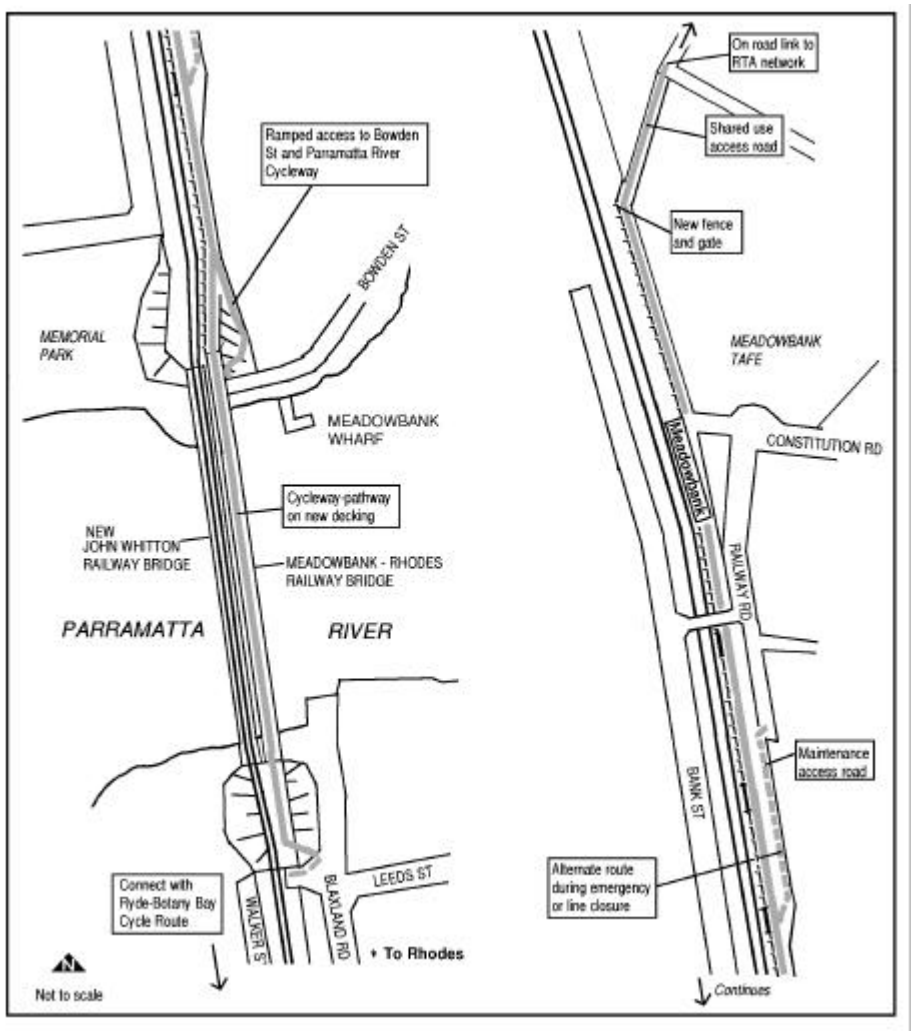

Figure 12 *- Location and Concept for Rhodes to Meadowbank Corridor*

Provision of direct cyclist and pedestrian access from Meadowbank Station to the ferry wharf would help develop Meadowbank as a transport node, linking train, ferry and bus services. Further afield, the corridor provides a connection in a major regional route all the way from Sydney's north, to Waterfall, using the Macquarie sub-regional network, currently under development by the RTA, the existing Homebush to Botany Bay route, the Como cycleway and the sealed shoulder of the Princes Highway.

The bridge is an historic structure with important heritage value, representing a good candidate for financial support for conversion to a pedestrian / cycleway. Both ends of the bridge fall within demonstration sites identified in the Parramatta River Foreshores Improvement Program (DUAP, 1996).

Issues

The old Meadowbank railway bridge and surrounds have a great historical significance. Organisations involved in the decision-making process affecting the bridge's future will include SRA, RAC, Ryde Council, Concord Council, the RTA, Waterways Authority, Department of Urban Affairs and Planning and the Heritage Council of NSW. Potential funding, and responsibility for the future ownership and maintenance of the bridge are to be resolved.

← *View looking along the eastern (up) side of the of rail corridor from overbridge just south of Meadowbank station*

Rail corridor issues include: whether there is available width adjacent to the active line; possible pedestrian conflict at Meadowbank station; and shared use of the access tracks leading to Railway St and Hermitage Rd.

Concept

It is recommended to create a pedestrian /cycleway across the disused bridge by placing lattice type mesh/decking over the existing formwork. The route in its entirety would be from Blaxland Rd. in the south to Hermitage Rd Meadowbank at the north, with connections to Meadowbank wharf. The facility would involve construction of a ramped access from Blaxland Rd. to the existing formation and thence on to the bridge. Conversion of the bridge to a shared path would require the provision of decking and safety fencing.

At the northern end of the bridge the pathway would split with a ramped access being constructed down the eastern embankment to Meadowbank Wharf and the Parramatta Valley Cycleway. The route would then parallel the tracks at grade within the corridor to Meadowbank station, then along the corridor to connect with the access track leading to Hermitage Road. A standby route along the existing SRA access track to Railway Rd could be used when line closures require the shared section to be used for maintenance access.

Costs, Funding & Management

A recent SRA Heritage Branch study estimates the cost of constructing a cycleway across the bridge (exclusive of approaches) at $0.8-1.0 million. Further concept-level costing undertaken for this study for the entire route indicates an overall cost of about $900,000, on the assumption that the major cost component, decking, can be installed for about $400,000 (refer **Appendix 10** for details).

Possible sources of funding for the project include the SRA, Ryde Council, Concord Council, RTA, Public Works, NSW Heritage Assistance Program, Parramatta River Foreshores Improvement Program Grants and Metropolitan Greenspace in addition to OCA funding, private sector sponsorship and public fund-raising. As the bridge is currently owned by SRA and it is liable to maintain the bridge in any case, it is appropriate that the SRA provide a major part of the up-front costs associated with restoring and maintaining the bridges superstructure and abutments, whilst he RTA and Councils would have the major responsibility for constructing and maintaining a rail-trail facility.

Given the potential range of authorities who may have some interest in the project, and the importance of longer term use for the disused heritage-listed bridge, it is felt that the longer term management of the bridge be undertaken by a Management Committee consisting of the authorities mentioned above. Longer term maintenance tasks and recommended action can be identified by the Committee, with possibly a trust set up to manage an investment account to cover future costs.

CASE STUDY NO.3: Northern Line - at Maud St Overbridge, Mayfield)

Background

A cycleway linking Prince St., Mayfield with the University of Newcastle, utilising access under the Maud St overbridge was first proposed in the Newcastle Area Bike Plan published in 1981. State Rail investigated the feasibility of this in 1987 and in 1993, both times rejecting proposals on safety grounds. The SRA has two main arguments against the cycleway: proximity of proposed pedestrian/cycleway to rail lines; and shared use of the

route by cyclists and maintenance crews. Since this time there has been correspondence regarding the proposal between proponents, political representatives and the SRA and DoT.

Need and Response to Selection Criteria

Newcastle City Council in conjunction with the RTA is planning to commence construction of the University East Cycleway this financial year. The currently proposed route would involve negotiating a refuge crossing of Maud St. This road (MR 305) has an AADT of over 20,000 vehicles, with a high percentage of these being heavy vehicles. The road is the main route for trucks carrying coal from Wallsend Colliery to the Port Waratah Coal Loader. Given that the suggested maximum level for a refuge crossing is about 10,000 AADT, and this location is also at the lower edge of a ridge trending north-south, there would be two major disincentives for those contemplating cycling to the University using such a route.

A cycleway under the Maud St overpass would permit the creation of a safe route to the University of Newcastle from the east. This proposal has been vigorously supported over the years by NCC, Newcastle Cycleways Movement and Newcastle University Students Union

Issues

A key issue is the perception by rail authorities that it is difficult for cyclists and pedestrians to share safely the use of a section of maintenance access road. The problems associated with sharing a portion of the route can be minimised by appropriate design and management, as discussed in sections 5.2.2 and 5.2.7. The provision of a new access point in Prince St. means that traffic along this portion can be significantly reduced, a positive benefit as it is obvious that the section past the embankment is barely wide enough to cope with rail maintenance vehicles.

Another issue raised is the proximity to the busy active lines. However the cycleway proposal would be in fact further from the rail lines (5.2m minimum) than a pedestrian / cycleway recently constructed by the SRA under the Main Rd overbridge near Cardiff Station. The removal of a row of gabions and reconstruction of the embankment is also an issue.

← *Maud St Overbridge at Newcastle, showing gabions at abutment and potential cycleway route on a bench above and outside the maintenance access road*

← *Section of Main Northern Line corridor constrained by embankment and narrow access road*

Concept

The recommended concept would address concerns of rail authorities by maintaining separate routes for cyclists and maintenance vehicles wherever possible, as well as providing adequate separation between the cycleway and the tracks. Although there are site constraints, a separation of at least 6.0 metres between the track centre and the closest portion of the cycleway would be possible at all times, and the cycleway would be separated from the rail lines and service track by fencing. For a 200m section the cycleway would need to share the service track, which at this location is already fenced from the rail lines. Providing gates at either end of this section would allow access by rail authorities, yet prevent cyclists and pedestrians from entering the land alongside the active lines.

Provision of a new and additional access point to the rail corridor through the land in Prince St would reduce the need for SRA vehicles to traverse the shared zone of the route and conflict between users would be consequently reduced. Access to the rail corridor could be attained by the purchase by NCC of a house in Prince St on the eastern side of Maud St, or via Alfred St, approximately 400m east of Maud St. As well as advantages of reducing the potential length of route (and shared maintenance access), purchase of a Prince St. property would permit construction of a new maintenance and emergency access route.

The recommended concept incorporates the following features:

- cycleway and separate rail maintenance track from Prince Street, through purchased land to corridor and eastern abutment of overbridge
- removal of gabions at the bridge and re-establishment of embankment
- a treated pine boardwalk with handrail to carry the cycleway under the bridge at the mezzanine level and down to level ground 50m west of the bridge
- stairways/ramps at Maud St to allow for pedestrian access under the bridge
- fenced route 2.5m wide asphalt surface to shared zone
- gates for the shared section, plus traffic signals operated by an induction loop or detector installed at each end of the shared zone to warn of vehicles
- a catch fence at the base of the embankment to restrain any rocks which may fall
- connection to the University East Cycleway where it meets the corridor .

These features are shown in **Figure 13**.

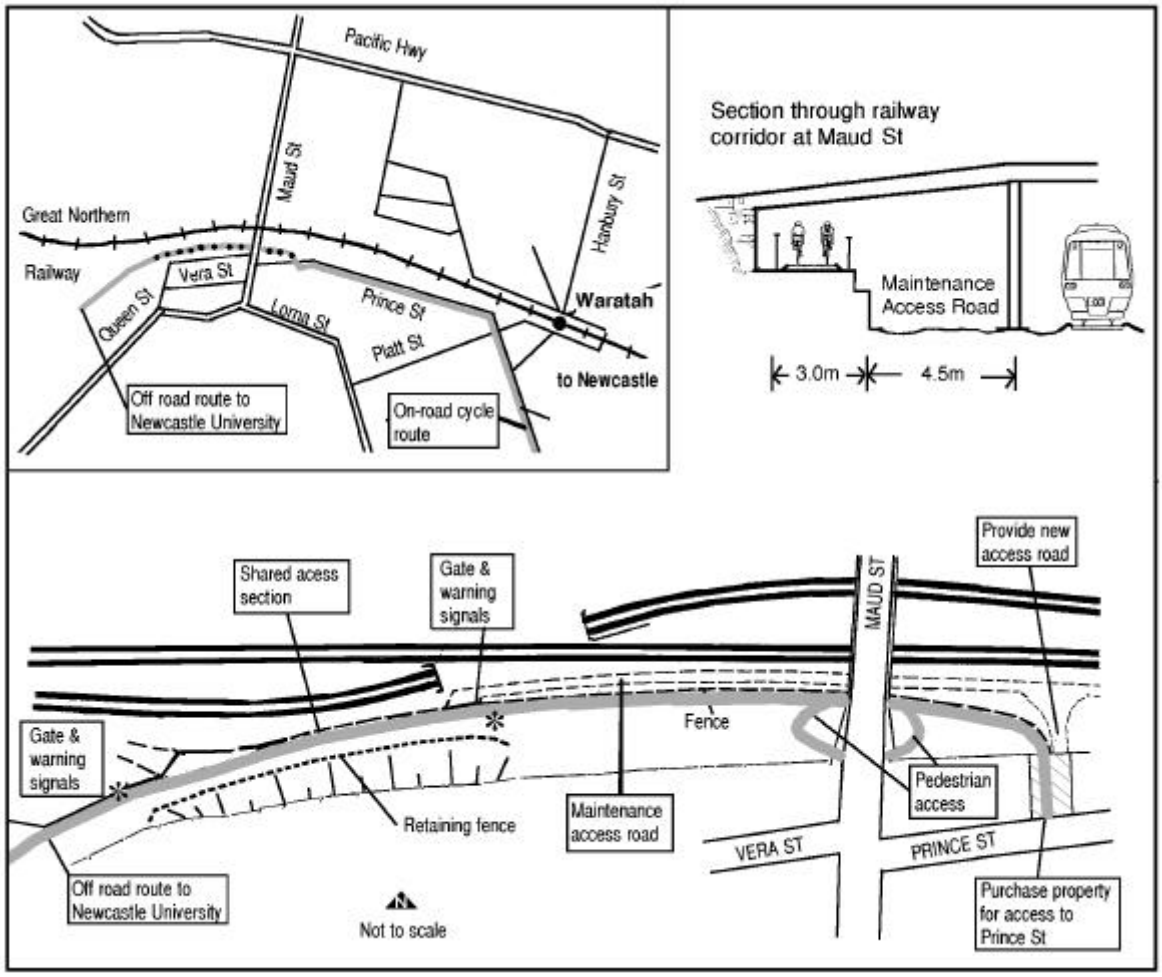

Figure 13 *- Concept Plan for Main Northern Line at Maud St*

Costs, Funding & Management

Concept costings for this proposal indicate that design and construction would necessitate a budget in the order of $250,000 (exclusive of house purchase). Refer **Appendix 10** for cost tables. Newcastle City Council, in conjunction with the RTA, is planning to commence work on the University East Cycleway in the current financial year. This work does not include a potential cycleway within the rail corridor, which would be an additional stage of the project. Funds from the currently allocated RTA source may be available, particularly for the purchase of the house in Prince St. After completion the cycleway could be maintained by Newcastle City Council as part of the overall University East Cycleway, with SRA involvement in the shared zone and sections of the corridor between the cycleway and the rail corridor boundary.

6.3 Rails-to-Trails Opportunities

6.3.1 Rails-to-Trails Priorities

Rail-to-trails opportunities that are the most likely to be successful and to provide the greatest benefit are those which have the following characteristics:

- **support:** has wide cross-section of support and advocacy within local and wider community
- **levels of use:** within reasonable distance of population centres, links to existing attractions and provides traffic-free recreational access where currently none exists, within an area of attractive scenery or environmental features
- **users:** provides opportunity for wide range of users (including those with disabilities), and provides a unique recreational experience within the state or region
- **heritage:** can make use of, and/or helps to restore and maintain existing rail heritage items
- **integration:** can be serviced by public transport which carries bicycles, at both start and finish (i.e. as "loop"), and links to, or complements, existing Countrylink/CityRail services and/or tourist railway ventures.
- **feasibility:** can be constructed and operated relatively easily with minimal impact on current or future rail operations or assets. A 'fenced' line, some time since operation and rails have been removed, or line cut; no possibility of future services. A short section of corridor (5-10km) which can be implemented initially
- **environment:** fulfils key planning strategies/policies for the location and has minimal environmental constraints, and manageable or beneficial impacts on adjoining landowners

The scenic potential of landscapes through which rail-to-trails pass should not be overlooked as a selection factor. As reported in the ART Newsletter, "*limited scenic interest may discourage popular trail development"* (ART, 1996b)

6.3.2 Disused Corridors Having Rails-to-Trails Potential

As discussed earlier in Section 4, and shown in **Figure 3**, there are some 2,000 km of disused rail line in NSW. From a total number of about 50 publicly owned disused corridors, 13 were felt to have sufficient merit to warrant a closer investigation for development of a rail-trail when reviewed against the selection criteria. Further to this selection process, three key corridors of differing lengths and characteristics were chosen as 'case studies' for detailed investigation.

In determining the potential for the various disused corridors, greater emphasis was placed on the intrinsic characteristics of location and potential demand and use, rather than ease of implementation or the presence of speculative proposals for tourist train operations. It was felt that where there may be initially some local opposition, this may be localised and not representative of wider community attitudes. Rails-to-trails proponents must work in conjunction with these groups and to represent the benefits that rail-trails can bring, so that this opposition may over time be turned around.

The list of disused lines and their potential for rail-trail development is presented below in **Table 6.** Sources of information used to assist in preparing the table included: Brodie

(1995), Freight Rail (1991), Griffin (1996), Laidley (1996), RAC (1996) and relevant topographic mapping, field inspection by the consultants and additional information provided during the consultation process.

Table 6 - Disused Lines with Potential for Rails-to-Trails

DESCRIPTION OF DISUSED LINE	RAILS-TO-TRAILS POTENTIAL
Awaba - Wangi Power Station (9km) Disused since 1989, with some infrastructure removed. Believed to be State Government owned corridor, or owned by former operator Elcom. Overbridge and approaches crossing main road have been removed	**Pros:** short length commuting and recreation connection to CityRail station, high number of potential users near corridor; inactive for a long time; no proposals for tourist trains; forested surrounds and Lake Macquarie destination **Cons:** corridor ownership possibly private; removal of tracks would require legislative approval; overbridge needs replacement or at-grade crossing of main road **Concept:** rail-trail within the formation, and installation of bicycle lockers at Awaba station **Corridor Potential: Moderate**
Blayney - Cowra (75km) Ceased operating 1987. Currently leased to Lachlan Valley Tourist Railway who run trains Cowra to Blayney and also to Canowindra. Corridor through tablelands rural grazing country. Line recently upgraded and maintained in good condition although bridge washaways a recurring problem for the tourist railway.	**Pros:** undulating rural countryside; tourist centre of Cowra and Central Tablelands tourist 'circuit'; XPT service to Blayney; current Landcare interest; tunnel at Carcoar **Cons:** lease to LVTR; few residents near corridor; **Concept:** endurance trail possibly along the service track (if continued use by LVTR); or circuit Blayney to Carcoar in conjunction with LVTR **Priority Sections:** Blayney-Carcoar **Corridor Potential: Low to Moderate**
Bungendore - Captains Flat (34km) Decommissioned 1968. An unfenced corridor, leaving the Sydney Canberrra line 4km south of Bungendore. Corridor leased since 1994 to a potential tourist train operator. Daily rail services to Bungendore from Canberra and Sydney, Buses twice daily from Canberra and Batemans Bay. Open and flat grazing country to Hoskinstown, then partly forested/hilly country (including crossing of Molonglo R to Captains Flat (former mining town)	**Pros:** close to major population, rural residential dwellings nearby; Bungendore developing as rural tourist stopover, diversity of landscape; short enough for day ride **Cons:** generally unfenced corridor, perceived user impacts; existing train enthusiast lease; limited services at destination (Captains Flat) **Concept:** day use, on-road from Bungendore to level crossing, then alongside active corridor to junction. Develop lunch area at Hoskinstown or near Molonglo River crossing. Could be trial of developing it as an unfenced trail. Possible link to Queanbeyan-Cooma corridor at Michelago via rural roads **Priority Section:** Hoskinstown - Captains Flat **Corridor Potential: Moderate**
Picton - Mittagong (22km) Decommissioned 1989. Thirlmere Railway Museum operate steam trains over the line from Thirlmere to Buxton, and hope to extend to Hill Top. A 200m section of track removed between Colo Vale and Braemar. Braemar to Mittagong currently active (shunting and yard). Deepest railway cutting in NSW between Buxton and Hill Top. Generally forested hilly country. Service track parallel to rails for most of corridor. Existing footpath and cycleway Braemar to Mittagong	**Pros:** short length (day use); recreation & commuting opportunities; close to population centres & rural estates nearby; links to Mittagong off-road cycleway; regular CityRail services to Picton and Mittagong; Thirlmere Lakes National Park and Train Museum attractions at Thirlmere. **Cons:** TRM's current use and proposed extension; legislation prevents track removal; active corridor at Braemar yards **Concept:** MTB trail along service track from Picton to Hill Top. From Hill Top to Braemar conversion of formation to a smooth, hard trail suitable for use by those in wheelchairs (either track removal or covering), and use of service track for parallel bridle trail. Promote jointly with TRM and link to CityRail services **Priority Section**: Hill Top - Braemar **Corridor Potential: Moderate to High (refer Case Study No.5)**

DESCRIPTION OF DISUSED LINE	RAILS-TO-TRAILS POTENTIAL
Cootamundra - Tumut - Batlow (131km) Services suspended 1984 due to flooding and landslide. Infrastructure in poor condition and damaged and noxious weed infestation from Cootamundra to Gilmore. Track and sleepers remain and right of way is well maintained, but fences over the line to Batlow. Tourist railway licensed to operate Tumut to Batlow 1988 to 1990 then suspended. Tumut to Batlow (27km) traverses steeply graded sections and passes through scenic foothills country where single track formation. Coach services only to Gundagai, Batlow and Tumut, regular XPT and coach services to Cootamundra.	**Pros:** long length which can be broken to sections, variety of landscapes, Batlow and Tumut on tourist circuit, adjacent Kosciuszko National Park and other trails; good public transport access to Cootamundra; interesting bridges and infrastructure; future rail use unlikely (esp. Cootamundra to Gilmore); support for adaptive re-uses **Cons:** potential lease to historical and railway groups, local interest for alternate uses of sections: conversion to road corridor, private access, etc.; cost of bridge repairs, modifications and maintenance (esp. Murrumbidgee River bridge and viaduct); general dilapidated condition of corridor **Concept:** initial development of key sections as commuting / walking trails, with future potential for multi-day trail with stopovers. Develop in conjunction with KNP and the Hume & Hovel Trail nearby depending on potential tourist train use **Priority Section:** Gundagai and Murrumbidgee R; Tumut to Batlow **Corridor Potential: Moderate**
Dumaresq - Glen Innes - Wallangarra (204km) Dumaresq-Glenn Innes decommissioned 1992; services withdrawn Glenn Innes-Tenterfield 1989 and to Wallangarra 1972. Good air, rail & coach access to Glenn Innes and Tenterfield. Very scenic in places - rugged tablelands countryside with spectacular views in places. Significant degree of maintenance required for bridges and for modification for pedestrians and cyclists. Proposals for tourist train Dumaresq-Glenn Innes. Much of corridor given over to grazing permits. A number of heritage listed buildings and infrastructure remain	**Pros:** great tablelands country; little prospect of future use - esp. Glen Innes-Tenterfield ; heritage station buildings; 'fenced' status, trail links to Queensland.; good transport services to Glenn Innes; Council interest in Landcare groups involved in managing the corridor; **Cons:** distance from major population centres, minimal tourist infrastructure; tourist train proposals, costs to develop and maintain over long distance (e.g. bridges); political pressure for corridor reactivation; interest from Rural Lands protection Boards for TSRs; rural landowner concerns and use by graziers **Concept:** develop in conjunction with rural interest; ultimately an extended multi-day cycle/walking trail. Initially service track to Glen Innes then formation to Tenterfield. **Priority Section:** Tenterfield - Wallangarra, **Corridor Potential: Moderate**
Kandos - Mudgee - Gulgong (92km) Services suspended in 1992. Classified as unfenced., and in good condition. The first 12km from Kandos to Rylstone is undulating open grazing country. From Lue it winds through hilly rural and forested country, then down into the flatter valley to Mudgee (at 51km). Open grazing country to Gulgong. There are 4 stations on the line which are heritage listed, with Mudgee station being substantial. A service track/firebreak follows for most of the corridor.	**Pros:** tourist interest and infrastructure at Mudgee, some local support, sections of interesting rural and woodland landscape; restored station buildings; service track/firebreak follows most of corridor **Cons:** distance to Sydney, interest from rail enthusiasts to run trains; possible future use for freight; landscape Mudgee-Gulgong less interesting **Concept:** develop Kandos-Rylstone rail corridor as a recreation and commuting cycleway by covering the formation, with the Rylstone to Mudgee section developed as a rough trail along the service track and the formation at cuttings or steep embankments. Potential for using stations as rest points **Priority Section:** Kandos - Rylstone; Lue to Mudgee **Corridor Potential: Moderate (refer Case Study No.6 Kandos-Mudgee)**

DESCRIPTION OF DISUSED LINE	RAILS-TO-TRAILS POTENTIAL
Molong - Yeoval - Dubbo (129km) Dubbo-Yeoval (47km) decommissioned 1988 and classified as 'unfenced'. Molong-Yeoval. Grazing leases and fencing along corridor and road crossings. Undulating and mainly cleared rural landscape. Proposals for a walking track and light railway from Dubbo to Dundullimal Homestead and to Western Plains Zoo, and for Greenway from Cumbogle to Dubbo	**Pros:** tourist attraction Western Plains Zoo; good XPT and coach access both ends; local interest for adaptive re-use and greenway **Cons:** lack of landscape variation; history of local opposition for 'greenway'; distance from major population centres; costs of modification to Macquarie R bridge; potential tourist railway **Concept:** rail-with-trail from Dubbo to Western Plains Zoo over Macquarie R in conjunction with light rail, then walking/MTB trail and landcare rehabilitation to Cumboogle, Further development of longer trail as local interest dictates. **Priority Section:** Dubbo to Cumboogle **Corridor Potential: Low to Moderate**
Pippitta - Homebush (1km) Loop line to former Homebush abattoir decommissioned in 1992. Eastern formation currently being rebuilt for Olympic Rail Loop. Western formation tracks removed, bridges remain in place. Disused corridor extends from former Pipitta station, across Parramatta Rd and the M4, then along an embankment to Avenue B within the Homebush Olympic site.	**Pros:** connections to State bicycle route to Olympics site and northwards, destination of State significance, short length of corridor, access to wide range of users; strategic use for pedestrian access during Olympics **Cons:** lead control of old bridge, resolving funding and ownership; less than ideal shared footpath route **Concept:** Shared cycleway / pedestrian route on east side of corridor, Richmond Rd to Parramatta Rd; Use of western bridges over Parramatta Rd and M4 to link Avenue B at Olympic site. Further Investigate potential for rails-with-trails route alongside Olympic Rail Loop. **Corridor Potential: High (refer Case Study No.4 Pippita-Homebush)**
Queanbeyan - Cooma - Bombala (210km) Ceased operating to Cooma 1989, to Bombala 1986. Michelago Tourist Railway operate monthly heritage trains from Queanbeyan to Michelago. Corridor undulating to hilly rural and open woodland country to Cooma then open and treeless landscape to Nimatabel, then open woodland grazing country to Bombala. Cooma has a well developed tourist infrastructure. Interest to develop links with Victorian rail-trails via Cann River.	**Pros:** unique and varied landscapes; long enough for overnight trips, endurance events; tourist infrastructure and good access at Queanbeyan and Cooma; potential link to other trails both north and south; local support with landcare; no likely re-activation (Cooma-Bombala) **Cons:** tourist train use; open and very exposed Cooma to Nimatabel; few residents near corridor; southern section more remote from population centres; **Concept:** long length rail-trail on formation with possible connections south into Victoria, and north to Captains Flat via Michelago. Potential for endurance horse trail for Cooma - Bombala section. Link with Landcare work in the area, and ARHS trips to trail head at Michelago. **Priority Sections:** Michelago-Bredbo; Cooma- Nimitabel **Corridor Potential: Low to Moderate**
Sandy Hollow - Merriwa (40km) Passenger services withdrawn 1973, ceased operating 1988. Rail and coach services to Musswellbrook (30km from line. Grazing leases and fences across line. Relatively easy grade through upper Hunter countryside and vineyards.	**Pros:** within Hunter Valley tourist circuit; can ride in one day; rural and hilly scenery; little prospect for future railway use **Cons:** few residents near corridor and distance from major centres; access to site by private vehicle or cycle from Muswellbrook or Denman; no major destinations at start or end; grazing leases and rural interests **Concept:** multi-use trail / horse trail or trike use. **Potential: Low to Moderate**

DESCRIPTION OF DISUSED LINE	RAILS-TO-TRAILS POTENTIAL
Tarana - Oberon (24km) Ceased operating 1979. Daily XPT to Tarana, and daily coach from Oberon to Mt Victoria. Grazing leases exist and many fences across the line	**Pros:** close to recreation features of Fish R valley, Lake Oberon, National Park and Jenolan caves; rugged and scenic country; good rail access; good length for day use; **Cons:** some potential for reactivation; sections unfenced; trail head rail junction only - no services; **Concept:** develop in conjunction with other attractions for package day use trail **Priority Sections:** Carlwood - Oberon **Potential: Moderate**:
Wagga - Tumbarumba (139km) Damaged by flood near Tarcutta 1988. Possible current shunting use to Ladysmith. Tourist train proposal but no current action on this. Spectacular mountain scenery, especially from Humula to Rosewood. Interest by DL&WC for conservation of section from Tarcutta to Tumbarumba as a walking track. Landcare groups at Tarcutta have leased over 12km of the corridor and other groups have interest in the section from Ladysmith to Tarcutta..	**Pros:** long length and opportunity for a wide range of users; strategic link from RAAF base to Wagga Wagga CBD; variety of terrain and landscapes; unique recreational experience in the region; good public transport access to Wagga; bridges and infrastructure; no likelihood of train services recommencing; potential political support; existing Landcare rehabilitation **Cons:** interest for train enthusiast use of the corridor to Ladysmith, modifications and maintenance of infrastructure; Hume Hwy dual carriageway cuts corridor; **Concept:** commuting/recreation route to Forest Hill, then endurance trail with stopovers at Tarcutta and Humula. Develop in conduction with KNP and the Hume & Hovel Trail nearby, and complement existing Landcare work **Priority Section:** Wagga to Forest Hill; Humula to Tumbarumba **Corridor Potential: Moderate to High**

6.3.3 Discussion of Key Rails-to-Trails Opportunities

Key Opportunities as Case Studies

The brief to consultants called for the development of feasibility studies and proposals for the key short-listed corridors. However as involvement of the local community is critical to the development of such proposals and to their implementation, it was felt most worthwhile to select a sample of corridors as 'case studies' in order to examine the issues involved and to point to potential or suggested concepts rather than to formulate definitive proposals. The Pippita corridor at Homebush stands out clearly from the others to be developed as a rail-to-trail facility. It is likely to be heavily used by a wide cross-section of the community, it will be relatively straightforward to implement (though fairly costly), and it would form a critical pedestrian access point into the Sydney 2000 Olympics site.

Other corridors carried forward to examine as case studies were the Picton-Mittagong and Kandos-Mudgee corridors. They are seen to have the greatest potential as demonstration projects and were investigated in more detail to allow concepts to be developed and feasibility and costings identified. The remainder of the short-listed corridors presented in

Table 6 are also worth considering as rail-trails, and further action on these is proposed in the Implementation Program (Section 7.0).

Shorter Lengths in Rural Centres with Commuting Potential
As well as the longer lengths of rail-trails connecting rural centres, there are also opportunities where a short section of disused corridor passes through a rural town. In these cases there is often a mix of potential adaptive uses: cycle commuting, recreation use, landscape rehabilitation; or for commercial or transport needs. These corridors may also act as catalysts for rail-trails development along longer sections of the corridor. Examples identified during this study include:

- **Goulburn** - using the Goulburn-Crookwell disused line, from the Goulburn commercial area to the fringe of the built-up area north- west of the City.
- **Yass** - within the town; development of an off-road route alongside the Yass Junction to Yass township which was closed in 1968. A bicycle route parallel to the corridor is proposed in the RTA network plans.
- **Gundagai** - along the Coootamundra-Tumut disused corridor. An off-road route is already proposed for about 4km of the corridor linking North and South Gundagai, using the former Hume Hwy. bridge. Constructing decking on the disused bridge would provide a more direct link.

Private Mining Railways and Colliery Lines
Many privately owned disused industrial and coal lines exist in the State. Some, such as the Box Vale line (abandoned in 1896) and the Newnes Oil Shale line (abandoned in the 1930's), are examples of rail-trails using former mining railways.

In the western Lake Macquarie and Maitland area, some of these disused corridors were tramways (such as the Wallsend - Glendale line) which are now subject to negotiation between Lake Macquarie Council (LMCC), NCC and the owner with a view to establishing further cycleway links as recommended in the Newcastle-Lake Macquarie Bike Plan. Concept plans are currently being developed by NCC for the Hexham - Kurri Kurri disused line, as far as Minmi, as a cycleway parallel to the rail formation.

In the Illawarra area, during the unfinished construction of the Maldon-Dombarton railway, a formation has been completed to the scarp. The formation is mainly within the Sydney Water restricted catchment area and thus not likely to be available for recreation use. (refer Figure 10 for location). There may be the opportunity to provide a substantial rail-trail along the section Waterfall to Austinmer if a proposal for a long tunnel to replace the existing line is ever implemented. The Otford deviation is already used as a trail.

6.3.4 Rails-to-Trails Case Studies

CASE STUDY NO.4 - Pippitta to Sydney Olympics Park

The Pippita to Homebush Bay lines were opened in 1911 to serve the sale yards and abattoirs. The lines were decommissioned in 1991. There are four bridges within the corridor; two over Parramatta Rd and two over the M4 motorway. The eastern bridges are to be used for the Olympic Rail Loop currently under construction, and it is proposed to use

the western bridges for pedestrian and cycle access to the Olympic site. Refer **Figure 14** for location and concept details.

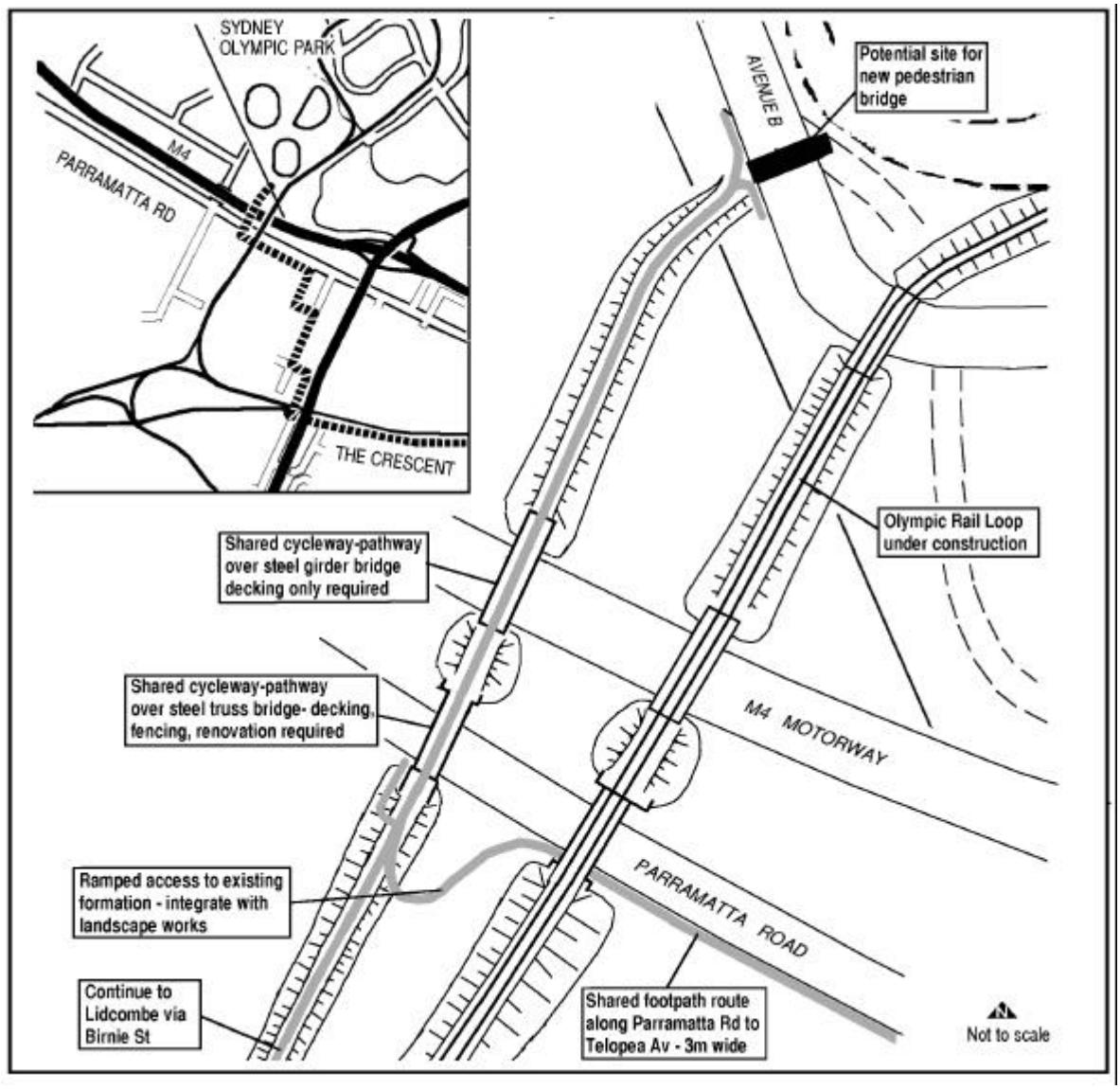

Figure 14 *- Location and concept for Pippita Corridor to Sydney Olympic Park*

The western bridges consist of a single-track steel truss bridge over Parramatta Rd with timber decking about 4 metres wide, and a newer steel girder bridge over the M4. The rails have been removed from these bridges along with some ballast. Land on the southern side of Parramatta Rd is owned by State Rail. Leases to private users have been revoked, with one of the occupiers since vacating the site, whilst the lessee on the western side is now on a 'month-to-month' lease. This portion has potential for satellite parking and bus pick-up and set-down functions to service the Olympic site. RAC now hold the lease over the narrow triangular portion of land east of the disused corridor. This area is proposed to be used as a temporary construction site for the Olympic Rail Loop.

Land on the northern side of the M4 is controlled by the Olympic Co-ordination Authority (OCA). It is understood that contracts for landscaping the rail corridor have been let for works related to the rail loop construction. No decision has yet been made regarding ownership of the western bridges. A pedestrian / cycleways network for the Olympic site is to be developed by consultants to OCA.

← *View of decking of Pippitta disused rail bridges. Parramatta Rd bridge in foreground with Olympic site visible on the skyline*

Response to Selection Criteria

The construction of a cycleway across the bridges in association with a local street network would provide connections to the Ryde to Botany Bay cycle route, which is a **N**ational Demonstration Project. Once within the Homebush Bay Olympic Park cyclists have direct access to Bicentennial Park, and further north to Rhodes and Meadowbank. With appropriate landscape treatment, the bridges could also provide an attractive 'entry statement' to the Olympic site. Residents of areas south of Parramatta Rd will be provided with a major off-road pedestrian and cycle link to facilities at Sydney Olympic Park.

The concept of providing a shared pedestrian/cycleway using the Pippita disused corridor has support from relevant agencies and interest groups. It is seen as being a very important facility for pedestrian access during the 2000 Olympics, and in the longer term, off-road bicycle network connections to Meadowbank. However, it is likely that for security reasons during the actual period of the Olympics, cyclists will be required to leave their bicycles within a compound located at the southern abutment to the bridge over Parramatta Rd, with the bridges carrying pedestrians only.

Issues

- ownership of bridges and current status of corridor
- future uses for adjoining SRA leases
- links across Avenue B at Homebush park and potential for additional overpass
- toxic lead paint covering Parramatta Rd railway bridge
- longer term potential for a rails-with-trails route along the eastern side of the Olympic rail corridor
- suitability of shared footpath route and clearance to bridge abutments
- links west to Lidcombe via Pippita station site

Concept and Use

The overall concept is to provide a grade-separated crossing of Parramatta Rd and the M4 from Auburn to the Homebush Olympic site utilising the disused Pippita rail corridor and the two disused railway underbridges. Local streets and a shared footpath section would connect the corridor with the bicycle network Refer Figure 14 above for a plan of the overall concept.

As part of the works in building the Olympic rail loop, a new bridge is being built over Parramatta Rd. The abutment of this bridge will be set back 3.5m from Parramatta Rd to facilitate shared use of the footpath. A ramped access to the existing formation would be constructed, as well as steps on the western side to provide for pedestrian access. A shared pedestrian / cycleway would be built over the bridges, with a width of 4.0m being recommended. This would involve the laying of decking over the bridge structures and providing side rails to the Parramatta Road bridge. Some other renovation work may be required. The pathway is to continue along the existing formation down ramped access paths to Avenue B at the Olympic site. The construction of a 3.0 metre-wide shared footpath route along Parramatta Rd from Telopea Avenue is recommended, providing a connection to the Ryde to Botany Bay Cycleway.

The optimal concept for this proposal would include an additional section of the route to follow alongside the eastern side of the Olympic rail corridor, rather than a shared footpath along Parramatta Road. This may require purchase of additional land or an easement, as the proposed Olympic rail line utilises most of the corridor width. However, despite these difficulties, a rails-with-trails route adjacent to the Olympic corridor from Parramatta Road to Richmond Road should be further pursued in conjunction with the proposals described here.

Costs, Funding & Management

Potential funding agencies for the bridge work and approaches are unclear, however the RAC, State Rail, RTA and Auburn and Strathfield Councils in conjunction with OCA potentially have some funding responsibilities. It is envisaged that funding of the construction of a pedestrian / cycleway along the section from the M4 to Avenue B would be provided by the OCA as part of its program. Concept-level costings indicate that the total works would cost in the vicinity of $700,000. Refer Table in **Appendix 10** for a breakdown of the cost items.

CASE STUDY NO 5 - Picton to Mittagong

The last train to run over the 37km Picton to Mittagong loop line as part of a regular service was in 1986, with the Buxton - Colo Vale section being listed as having services suspended in 1989. The Colo Vale to Braemar section was partially dismantled in 1987 and a 200m section and bridge were removed. There is an active siding at Braemar linking a railway carriage workshop with Mittagong. Refer Figure 10 above for location of the rail corridor and links to the active rail network.

Since the cessation of services, Thirlmere Railway Museum (TRM) has been running tourist trains from Thirlmere to Buxton, as well as maintaining the line. The organisation leases the entire corridor from State Rail as a community lease. The section between Buxton and Hill Top is currently being restored for tourist train use. TRM hope eventually to take tourist trains as far as Colo Vale. A heritage listed station building at Colo Vale has recently been restored, and TRM is in the process of reconstructing a station building at Hill Top.

The Picton to Mittagong corridor has some attractive forest and highlands scenery and includes the deepest cutting in Australia, between Buxton and Hill Top. A service track follows the corridor over reasonably level to undulating terrain from Thirlmere to Hill Top, and already has informal use by walkers, horse riders, trail bike and mountain bike users.

Need / Response to Selection Criteria

The Picton - Mittagong loop could be considered a potential rails-to-trails project for the following reasons:

- it is of reasonable length; long enough to attract recreation use, but short enough to ride in a day
- there is potential for a wide range of users, and sections could be developed for use by those with disabilities
- the loop can be serviced by CityRail at Mittagong and would provide a potential link with, and complement, tourist train or motor rail services to Thirlmere and Picton
- some portions of line have been removed past Colo Vale and thus potential for future railway use is minimal

← *Section of disused corridor adjacent to F3 freeway, near Braemar showing silt and vegetation build-up over the formation and waterlogged condition.*

Issues

Issues which need to be addressed include:

- the potential extent of tourist train use of the line. At present the train operates to Buxton, and there are proposals to extend this to the station to as far as Colo Vale. If this does not proceed, then there is potential to make use of the formation
- steep cuttings on the section approaching Hill Top where shared use of the corridor would be difficult

- removal of the line (or sections of it) - given the topography, the ideal concept requires removal of rails and ballast. This would require formal closure of the line by Act of Parliament
- bridge removed approaching Braemar, and active rail corridor for shunting from Braemar to Mittagong

Concept and Use

The overall concept for this section would be to establish between Thirlmere and Mittagong a multi-user trail system sharing the sections of corridor currently used by TRM, and, where not used, to cover the existing formation and construct a smooth, hard trail along the formation.

Key features of this concept could be:

- development of a multi-use trail over the service track from Thirlmere to Hill Top, or to Colo Vale if TRM continue services to there. The trail would be located between the road and the rail formation; given the low frequency and speed of trains, degree of separation existing and the current informal use, provision of fencing to separate trail users from the tracks is not seen as being necessary
- conversion of the existing formation between Braemar and Colo Vale so as to provide a smooth hard-surfaced commuting and recreation cycleway and multi-use trail between Colo Vale and Mittagong, Connections to rail services at each end could provide transport to and from Sydney. The trail could be used by those in wheelchairs, or using hand-cranked tricycles. If it is some time before the section of formation from Colo Vale to Hill Top is used by TRM, it could be used as a rail-trail in the interim by covering between the rails with a layer of gravel over geotextile fabric
- Establishment of an equestrian, MTB track parallel to the main rail-trail using the service track. This would permit the creation of a loop for some cyclists and walkers (if this is not seen to conflict with use by horse-riders).
- Development in a way which complements the active section from Picton to Hill Top. This could include joint ticketing, lunch rooms at Hill Top and possible carriage of bicycles and wheelchairs etc. on a motor rail back to Picton, thus boosting patronage of the tourist train service.

Costs, Funding and Management

As shown in the detailed costings shown in **Appendix 10**, the proposal would require funding in the order of $700,000. This assumes that salvage of rails, ballast and sleepers, and regrading of the capping material, is cost neutral.

A range of funding options could progress this including:

- funding from disability grants etc. for the proposal as a model for disability access
- RTA funding for the portion connecting Mittagong with its outskirts
- sponsorship / donations from businesses in the Southern Highlands Tourist Region
- tourism funding to assist development of a marketing package to link with existing Southern Highlands marketing

- regional development funding for rural centres.

Management of the rail-trails could most likely be effected by a management committee at local level with input from Councils and RTA, SRA Heritage and community stakeholder groups such as Thirlmere Railway Museum, cyclist groups and disability organisations.

CASE STUDY NO. 6 - Kandos-Mudgee-Gulgong

Background

This corridor has a total length of 92km, and is classified as unfenced. A local management study undertaken in 1994-95 by Brodie described the line as being in excellent condition and passing through very attractive country to Mudgee. Most of the corridor from Mudgee to Gulgong is open grazing country. The location of the corridor in relation to other rail lines is shown in Figure 3. Services on the line were suspended in 1992 due to economic non-viability. The corridor contains a number of timber trestle bridges, four stations and a number of other infrastructure items on the line which have been included on the Heritage and Conservation Register of State Rail. The value of sleepers and rail *in situ* is estimated at $3million (Brodie, 1995).

Opportunity and Response to Selection Criteria

Not all of the Kandos - Mudgee - Gulgong corridor has potential for development as a rail-trail. Probably the two sections with the greatest potential are Kandos - Rylstone (6km) and from Lue - Mudgee (30km). The section from Kandos to Rylstone would not only provide a recreational route in an area with an attractive backdrop of forested hills, but would also provide a connection between two rural centres. The Lue to Mudgee section has been recommended previously by Brodie for development as a walking track. The section from Mudgee to Gulgong is relatively flat and a less diverse landscape and is seen to have much less potential for rail-trails development.

During the site investigation and review process, the following are identified as positive aspects for development of the corridor as a rail-to-trail:

- it can be serviced by Countrylink coach services at the start and finish of the trip
- potential to complement the nearby tourist interest of the upper Hunter wine growing areas, and the history of Mudgee and surrounds
- can make use of well maintained / restored heritage items (stations)
- has support within the local community (as reported by Brodie)

← *Section of corridor between Rylstone and Lue showing railway cutting. The service track/firebreak follows the surrounding terrain within the corridor.*

Issues

- leases for grazing issued over the corridor; consequent response of adjoining landowners to adaptive re-use as most of the corridor passes through private property
- soundness of bridges would need to be assessed. The three timber bridges need some repair with surface rot evident.
- interaction with local Landcare groups, and gaining local support
- removal of the track - this could provide revenue for both trail establishment and ongoing management of the entire corridor, should the rail authorities relinquish right to salvage of part or all of the corridor length
- potential future reactivation of the line. As is the case with many disused lines, locals remain ever hopeful that the line will be reactivated. Apart from a major industry needing to transport bulk goods to Sydney, there is minimal prospect in the foreseeable future of reactivation. Realistically the most that could be expected from the line in the near future would be occasional use by train enthusiasts.

There are some drawbacks inherent in the area which reduce the potential for rail-trails. Although the country is described as attractive, it is fairly typical of Central Tablelands mixed grazing rural area, with more spectacular country immediately to the east and closer to Sydney. There are low-trafficked unsealed rural roads as alternatives and trails through the National Parks, which would provide an easier surface than using the service track Thus a rail-trail would have to rely on attracting more local use. Rylstone/Kandos are not major attractions in their own right and have a small population base. There is likely to be difficulty in getting locals to agree to remove rail, thus necessitating a lower key approach initially.

There are few visitors who travel to the Blue Mountains who continue on to the Central Tablelands, and even the popular Newnes trail within the Blue Mountains has a maximum number of visitors of about 200-300 per weekend. Thus use of the Kandos-Mudgee line as a rail-to-trail would be expected to be fairly low; at around 50 persons per weekend maximum. A small number of regular users would utilise the section Kandos to Rylstone.

Concept

Given the background as discussed above, the corridor is unlikely to attract even moderate levels of use, unless it is developed as a high quality trail, primarily within the rail formation, and in conjunction with other attractions. The most viable concept is thought to be one which would retain some flexibility and diversity.

Suggested approaches include:

- developing the Kandos-Rylstone rail corridor as a recreation and commuting cycleway, with the main objective to encourage regular local use, particularly as a route for school students. Develop a rehabilitation and replanting theme for this section as part of Rylstone's Centenary celebrations in 1997.
- the cycleway could be constructed by filling-in between the tracks with fine gravel to just below the railhead. This would enable trikes to be used, reactivation at a later stage if required, and provide a heritage focus, whilst ensuring all the advantages of using the rail formation. Technical studies would need to be undertaken to establish the best method
- using parts of station buildings as secure bicycle storage areas
- for the Rylstone to Mudgee section develop a multi-use trail within the corridor. This could best be undertaken using the service track/firebreak alongside the formation over the more level sections. In the hillier sections, such as through cuttings and over embankments, the formation could be used by filling in over the sleepers. This section of trail would not need to be constructed to as high a standard as the Kandos-Rylstone section.

Thought could be given to complementing the current craft centre use of the Lue station buildings as an accommodation or rest area. The two sections could be incorporated in a Countrylink travel package including Hunter Valley winery tours.

Costs, Funding and Management

Total costs for the proposal as detailed in **Appendix 10** are estimated to be about $420,000 for works and maintenance for a ten year period. Of this total the Kandos Rylstone section, consisting of crushed gravel pathway over formation would be in the order of $150,000. If removal of tracks were to be approved, funding for the trail could come entirely from the salvage of track and sleepers. The trails could be constructed with minimal work following removal of track and ballast.

6.4 Rail-Trail Development Guidelines

According to DoT (1982) *"continuity of route over a reasonable length, good access at frequent intervals, and links to schools and nearby centres of population are crucial elements of the success of a railway route project"* p.vii

Other general development principals include:

- work with local materials were possible
- design the facility so that a 12-year-old could cycle on their own
- recognise that rail-trails may need to be used by a small child or someone from a non English-speaking background who may not understand signage

There is furthermore, a considerable amount of literature available documenting the design, construction and management of multi-use trails. These topics will not be covered in detail in this report. Publications which provide detailed technical information and which could be referred to during the design and development stages for rail-trails in NSW include:

- *"Trails of the 21st Century: Planning Design and Management for Multi-Use Trails"*. Washington DC. Rails to Trails Conservancy. 1994. (includes information on surface and subgrade, and design loads)
- *"Planning Design and Management of Multi-Use Recreation Trails"* Victorian Department of Conservation and Natural Resources. 1994.
- *"Rail Trails Victoria - A Guide for Prospective Committees of Management"*. Victorian Department of Conservation and Natural Resources 1994.
- "S*ecrets of Successful rail-trails An Acquisition and Organisational Manual for Converting Rails into Trails"*: Karen-Lee Ryan & Julie A. Winterich ed. (1993). Rails-to-Trails Conservancy in co-operation with the National Park Service.
- "*Austroads Part 14 - Planning for the Bicycle"* Austroads, (1993)
- *"Making Ways for the Bicycle - A Guide to Traffic-Free Path Construction"*. Sustrans (1994). In association with the Bicycle Association of the UK. Sustrans, Bristol, 1994
- *"Report to Government on Recreation Trails - Trailswest"* Ministerial Taskforce on Trails Network, 1995. (includes guidelines for surface treatment and maintenance)

7 IMPLEMENTATION

7.1 Rail-Trails Administration

7.1.1 Need for Rail-trails Co-ordinating Body

The development of rail-trails is a relatively new initiative for NSW and will require changes to current practices, and development of new protocols. As a process of 'change management', planning for, and implementation of rail-trails will require the following sorts of support:

- assistance in co-ordinating funding and grant applications
- an independent and representative body to resolve issues arising from rail-trail proposals and co-ordinate action between member agencies
- follow through implementation programs
- provide advice to government
- body to engage and co-ordinate research where required
- provide guidelines and advice to management committees and liaison with rail-trails organisations

Where decisions need to be made by a range of agencies, there is a need for an independent co-ordinating body. For instance for rails-with-trails there is a need to co-ordinate the actions of many agencies involved in transport infrastructure planning, for example DoT, RTA, SRA, RAC, and Councils. Such a body could also ensure that issues of conflict of interest do not arise e.g. if administered by RAC or SRA there could be a conflict of interest with corporate goals. This body can have a broad representation, community input, and provide advice to government. An independent body, would be desirable for further research on best practice and carrying on consultation with authorities and the community.

For rails-to-trails, the experience in Western Australia and Victoria is that a co-ordinating agency can fulfil a very useful role to integrate development of a trails 'network'. The Trailswest study finding was that a linked trail system was needed, and this would be best accomplished with the formation of a co-ordinating agency (Ministerial Taskforce, 1995). However this task is not seen as relevant in NSW, as discussed in section 6.0, in NSW there is not the same potential for an extensive network of rail-trails as is the case in those states. In NSW most of the trail opportunities are likely to be in National Parks, r on Crown Land and State Forests lands. An inter-agency panel could be set-up instead to develop a trails network.

There is a need to place a permanent executive officer position within such a body to ensure that day-to-day and ongoing programs are implemented in the face of not bogged down with existing commitments. This works successfully in Victoria where an officer within the DCNR, oversees the development of rails-to-trails: they now have 11 rail-trails have been established in under three years. In Western Australia, an officer within the Ministry of Sport and Recreation has rail-trails responsibilities, but they are yet to establish a rail-trails Council, as recommended by Trailswest, is yet to be established.

Given these factors, it is suggested that there be a permanently staffed body to assist in the implementation and administration of rail-trails in NSW.

7.1.2 Structure of Co-ordinating Body

Some guidance re. potential rail-trails organisational structure can be gained from the Trailswest model where this issue was very closely examined. Trailswest recommended that a Council be instituted to guide rails-to-trails development, with the Council being established within the Ministry of Sport and Recreation. An Advisory Committee would provide for public participation, whilst an Interagency Co-ordination Panel would provide expertise and advice. In contrast, rails-with-trails development in Perth (cyclist-only veloways) is being undertaken by Bikewest, a statutory body set up under the Department of Transport. The closest NSW equivalent of Bikewest would be the RTA's Bicycle Unit. However, compared with Western Australia, and perhaps Victoria, there is not likely to be such a clear-cut distinction between rails-with-trails and rails-to-trails opportunities in NSW. This suggests a single co-ordinating body is required with sufficient flexibility to deal with varying rail-trails situations.

The location of the body and who it reports to is also likely to differ from other models. The NSW DoT has a key strategic planning function in relation to integrated transport networks, indicating an involvement at both policy and planning levels. Activities involving the rail corridor are still clearly the responsibility of rail authorities, and they must have a key role in any co-ordinating body. The RTA is strategically responsible for developing the bicycle network and funding key bicycle facilities. DL&WC, as the key land management agency, is well placed to administer trails in the rural areas.

Thus the co-ordinating body must be open to liaison and contact with the relevant agencies. Given that this study has identified a major focus for rails-with-trails opportunities, it is felt that the body should report to the Minister for Transport. Initially it would be best to house this body under an existing agency rather than set up new offices. It is suggested this be within DoT. For the early stages in rail-trails implementation, this body could consist of an executive officer, rather than a large secretariat.

The body could be established as a 'Rail-Trails Unit' to (among other tasks) increase public awareness of the rail-trails opportunities. Rather than establish a formally structured Advisory Committee as in Western Australia, community input could initially be gained on an informal basis through executive officer liaison with relevant local stakeholders. Local Government Bicycle Committees (where they exist) could be involved with implementation of each of the rails-with-trails in their area under the direction of the Unit. Rails-to-trails opportunities could be developed by local COMs formed with the assistance of the Unit, and guided by material the Unit prepares.

At a later stage, and as dictated by needs and resources, this unit could evolve into a secretariat to a 'Rail-trails Council' or similar, with a formally established advisory committee and inter-agency panel.

7.1.3 Roles of a Rail-Trails Unit

Given the sorts of opportunities identified in this study, and the complexities of rail-trail planning in the urban situation, it is believed the focus for a rail-trails unit would be the implementation of rails-with-trails facilities, although there would be scope for such a unit to act as an advisory agency for, and instigator of, rails-to-trails projects. The suggested tasks for the Rail-Trails Unit would be to:

- establish a policy framework to assist State and Local government agencies and rail-trail groups and organisations to plan, implement, manage and maintain rail-trails facilities
- foster community awareness of rail-trails opportunities and act as a conduit for discussion
- prepare guidelines to assist State Government agencies, local government and community groups in rail-trails development and assessment
- collect research and guidelines and planning information and produce handbooks to assist community groups
- contribute to planning studies, transport and tourism strategies to ensure opportunities for rail-trails are considered
- provide advice and support to government

Another feature of the Western Australian Trailswest model is an interagency co-ordination panel to provide expert review of rails-to-trails proposals and advise on best community use. Although this role could be developed in the longer term, initially these tasks could be undertaken by the Rail-Trails Unit on an 'as needed' basis. The Advisory Committee's main function would be to provide a conduit for to public and community input and feedback. Similarly the officer could hold working group meetings in lieu of the interagency co-ordination panel as established for the Trailswest Council.

7.1.4 Legislative and Statutory Review

Consultation during this study, and reference to reports prepared by State rail officers, consistently point to problems with current legislation. The general view is that provisions of the Transport Administration Act, preventing closure of a rail line or removal of rail infrastructure, are anachronistic and need to be reviewed. As the Act currently applies, rather than providing any realistic reassurance to rural communities in NSW that railways will remain, it now hampers sensible and practical adaptive re-use of corridors effectively abandoned for railway use.

Among recommendations in a report prepared by Griffin (1996) during the rail portfolio process, legislative options for *"simplifying and streamlining the processes to close a railway [include] Amending the TAC to allow the Minister to close a disused line is one option. This option is unlikely to succeed but is worth trying"* A recommendation was also made that legislation generically identify disused lines as facilities that are not to be commercially funded: *"When all of the other options for productive use of a currently disused railway have been exhausted, explore the options to formally close the railway."* However, as recognised by Griffin, the situation is politically sensitive, and recommendations were not pursued in the restructuring of the rail portfolios.

In summary, the sorts of problems the existing rail legislation and administrative arrangements for rail-trails development include:

- corridors which are clearly disused and decaying infrastructure is not able to be removed, and where the community has called for adaptive re-use, would require legislation to approve closure - this may be difficult to achieve
- a better definition is needed for abandoned corridors - so that they can be vested in a more appropriate agency
- provision of access to non-rail users within the corridor has become more complex, with a number of authorities now being involved with rails-with-trails proposals, some statutory, some corporate

It is suggested that these issues be taken up by the Rail-Trails Unit with a report to the Minister recommending legislative revisions.

7.2 Funding

7.2.1 Funding Requirements

Funding will be needed for rail-trails administration as well as funding for each facility. The main area where ongoing rail-trails administrative funding will be required is in setting up and operating a Rail-Trails unit, requiring establishment of a staff position and other resources. It is suggested that this occur under the DoT. It is estimated that this would require funding in the order of $150-$200,000 p.a. for salary, office environment, travel and preparation of material. Further funding amounts may be necessary for specialist studies and research work.

Each of the identified rails-with-trails projects is likely to require specific funding. The combined total estimated to be required for those rails-with-trails opportunities investigated as case studies is approximately $3.5 million, whilst most of the other opportunities identified would require funding from about $20,000 for the short lengths requiring just trail surfacing and fencing, to the longer and more complex opportunities requiring major engineering structures costing over $1 million.

Funding needs for rails-to-trails vary greatly. The case studies presented show that construction costs can vary from as little as $10,000 per km to over $100,000 per km depending on existing conditions and surface required. Estimated total concept level costs for these corridors are approximately $1.4 million, for a total of 79km of rails-to-trails. Funding can also be required at initial stages for surveys and expert studies. However, as discussed earlier in the report, many of these items can be provided by voluntary labour or by donations of material or services, thus reducing overall funding requirements.

Maintenance can be a major rails-to-trails funding requirement. Although not as high as rails-with-trails facilities on a per km basis, at about $1,000 per km per annum, due to the long lengths involved the total cost increases. Maintenance funding requirements also vary greatly between corridors, depending on whether major structures such as trestle bridges are

involved. It is likely that most of the rails-to-trails projects will require some form of seed funding to establish a management committee and develop a business plan.

7.2.2 Funding Strategy

A number of references put forward ideas on how best to approach secure funding for individual projects. According to Jones (1994), a funding strategy is required for most projects to maximise the chances of success and minimise delays in implementation. A recommended funding strategy according to Jones has the following steps:

- **identify funding sources -** this will necessitate the quantification of benefits
- **talk with the grant agencies -** obtain selection criteria and develop a funding proposal
- **interagency co-ordination** - talk to other government stakeholders
- **identify constraints -** address obstacles and constraints, including undertaking an environmental assessment
- **develop a masterplan -** by developing a multi-use trail or bikeway plan
- **develop a priority list -** focusing on the highest priority segments
- **build local support -** by encouraging local commitment and involvement

Timing of project funding also needs to be considered. According to DoT (1982), large cost items such as bridge renewal and maintenance should be carried out as and when needed thereby permitting a relatively modestly-priced first phase scheme to be built. They also believe that the longest length possible should be built in one phase with any supporting work undertaken in a subsequent phase. This establishes the route for use by the public and can add momentum to the search for additional funding. In a similar manner, a controlled crossing of a busy road (which may currently act as a barrier to cyclists and pedestrians) should be installed in the initial phase to encourage use.

7.2.3 Funding Sources

The various funding sources which may be available for rail-trails projects in NSW have been identified earlier in Section 5.2.8. Guidelines produced by the Victorian DCNR summarise the many potential grant and funding sources, that are available in Victoria (DCNR, 1994a). For NSW, it is believed that the following sources are the most likely to be used in rail-trails projects:

- RTA bicycle network funding - either as 100% for connections in the regional and sub-regional network or “dollar-for-dollar” funding to local councils
- local government - mainly as ‘dollar-for-dollar funding with RTA, but also smaller projects which fulfil a number of benefits for local communities and relate to Council assets or provide links to Council area
- Federal and State government environment grants and rehabilitation grants (e.g. the Green Corps funding administered by the Australian Trust for Conservation Volunteers)
- local sponsorship or donations of ‘in kind’ assistance from the corporate sector and individuals.

If a dedicated rail-trails funding initiative is developed by the NSW State Government, this could be used to make up any shortfall in construction funding provided by the above sources for high priority projects. Local councils and trail managers should be aware of

how regional tourism development programs can assist trail promotion and development. The Australian Tourism Commission provides $23 million over 4 years for regional and rural Australia - including diversification of the product base and tourism infrastructure.

Given the stringent budgetary climate, and the corporate goal for rail authorities of financial self-sufficiency, 'kick-start' funding may be needed to develop many rail-trail proposals. All of the proposals identified have a number of agencies involved, each with some form of funding responsibility.

As evidenced by the response both in Australia and overseas, there is very broad community appeal in good rail-trail projects. Thus there should be good support for agencies jointly agreeing to a joint funding package, at least for initial 'demonstration' projects.

7.3 Gaining Stakeholder Support

The study by Sustrans in the UK in their formative stages (DoT 1982) concluded that close involvement of user groups in all stages of design and construction is of considerable importance. This view is shared by the other rail-trails organizations such as RTC, ART, DCNR and Trailswest.

As the example at Glenn Innes has illustrated, conversion of disused rail corridors to rail-trails can meet with very vocal opposition at times. It is important to have the support of local people, as they will be the ones who will benefit most, and will also be able to drive the proposals. Actions which can be taken to secure support within the community for rail-trails include:

- raising the level of awareness within the community regarding rail-trail opportunities, and ensuring that proposals are driven by local communities, especially in rural areas. Develop first those proposals, or sections of proposals, about which where there is agreement.
- developing a strategy to resolve the issues relating to adjoining landowners in rural areas. This should address such issues as privacy, access, spread of disease and fire hazards.
- having a local 'champion' or pro-active rail-trails group

A problem for rails-to-trails is that those that have the highest potential use can be those that are nearest to rural residential populations and have adjoining landowners who may perceive rail-trails as attracting undesirable elements to their area. By contrast, in rural areas rail-trails can be seen as encompassing income-producing activity. As discussed in Section 5.3.4, adjoining landholders can be the most vocal advocates of rail-trails once they are aware of benefits and any issues of concern are addressed.

Previous calls by the DoT for expressions of interest for the use of disused rail corridor have met with little response. While calls for expressions of interest are a valuable way of engaging the public, greater public awareness of the potential for rail-trails development should be fostered prior to expression of interest being invited. There could be a role for a Rails-Trails unit to foster this interest at the local level.

Having "Friends of the Trails" or other rail-trails advocacy groups at the local level will be important if opportunities are to be pursued. There could be a further role for the RTU to assist in the development of community-based rail-trails groups where proposals are developed, or for a State-wide organisation such as ART to take on this role.

The support of public sector agencies and elected representatives is also very important. Rail-trail organizations such as ART can gain political support by preparing a 'prospectus' describing the potential benefits to NSW from rail-trails. The concerns of rail authorities should also be recognised, and issues dealt with in a practical and systematic manner as mentioned above.

7.4 Implementation Program

7.4.1 Rail-Trails Action Plan and Timetable

Given current momentum for the development of disused corridors, the potential for funding under the Green Corps grant program and the urgency of action over a number of the key proposals, implementation needs to be undertaken immediately to ensure opportunities can be taken up. An implementation plan for the two year period 1997/98 - 1998/99 is recommend in **Table 7** below:

Table 7 - Rail-Trails Unit Implementation Timetable 1997-99

TASKS	1997				1998				1999			
1. Initiation												
1.1 Report release			✪									
1.2 Establish Funding Sources				■	■							
1.3 Apply for funding grants for 1997-98 year				■								
1.4 Obtain approval for Rail-Trails Unit				■								
1.5 Conduct Workshop / Present Findings					✪			✪				
2. Establish Rail-Trails Unit												
2.1 Confirm structure, roles & composition of Unit				■	■							
2.2 Set up/staffing of Unit under DoT					■	■						
2.3 Produce 'prospectus' for rail-trails in NSW						■						
3. Develop Guidelines & Policy												
3.1 Procedure for handling rail-trail proposals						■						
3.2 Develop Risk Management Protocol						■	■					
3.3 Design and operational guidelines							■	■	■		➔	
4. Instigate Studies												
4.1 Trials of rail-trails over formation				■	■	■						
4.2 Commence detail feasibility studies for r-w-t					■	■	■		➔		➔	
4.3 Develop rail-trails database							■	■	■	■		
4.4 Integration with RTA bicycle network studies						■	■	■	■		➔	
4.5 Monitoring of use of rail-trails and cycleways						■	■	■	■	■	■	
5. Development of Rail-Trails												
5.1 Establish priorities and staging for rail-trails					■							
5.2 Assist implementation of rail-trails						■	■		➔		➔	
5.3 Review of RTU progress											■	

■ Period to complete task ✪ Specific Task ➔ Ongoing Task

7.4.2 Development Stages for Rails-with-Trails Opportunities

Apart from Greenway-1, there has been little documentation of the steps involved in implementing rails-with-trails in NSW. In Victoria development of rails-with-trails has occurred over a period of years, whilst in WA the Perth veloway network has taken over four years to reach final design stage and is still to be commenced.

The key to an established program in NSW for rails-with-trails will be to integrate facilities with on-road bicycle networks, railway developments and interchange works. Each corridor will have different characteristics and the implementation process may vary according to

local conditions and issues. Thus the sorts of steps in implementing a rails-with-trails proposal in NSW should include:

Stage 1 - Identify Rails-with-Trails Opportunity: potential routes identified (in addition to those identified in this study). Details notified to RTU who would co-ordinate initial action.

Stage 2 - Establish Working Group: RTU to establish inter-agency working group composed of agencies and key interest groups in the locality to progress each proposal and to provide a forum for public input and comment The local Bicycle Committee (if established) would be an appropriate body to progress the smaller rail-trails falling within the boundaries of a single LGA.

Stage 3 - Address Issues and Constraints: identify issues and constraints and assess as to merit to undertake concept planning. Undertake any further studies or clarify outstanding issues as required. Integration with Transport and Development Planning: - examine opportunity in context of integrated transport planning for the area.

Stage 4 - Develop Concept: identify user needs and objectives, design guidelines, site assessment and future rail plans. A detailed site survey may be required to establish the exact boundary to the corridor, and title search undertaken to confirm land title and ownership.

Stage 5 - Prepare Management Plan: means of ensuring a vision becomes a reality, and allows management committee to identify strategies in relation to funding and timing. It will assist in the finding of funds and/or loans and grants. In most of the experiences for rail-trails a master planning process has been undertaken, or is a statutory requirement. Determine leasing or licensing arrangements.

Stage 6 - Construction and Management: construction authority (generally Council or RTA) prepares specifications for work contract and facility is constructed. Facility managed under agreement from SRA. Regular monitoring and maintenance is required to fulfil risk management requirements, and to identify tasks for maintenance work program. Pre- and post-construction monitoring of facility use should also be undertaken.

7.4.3 Development Stages for Rails-to-Trails Opportunities

In Victoria there is now in place a well-developed process for establishing rail-trails, and, as this seems to be operating effectively, this model can be adapted to the situation in NSW. The main difference in Victoria is that the corridors have generally been vested in DCNR and infrastructure removed. A summary table from DCNR "A Guide for Prospective Committee of Management" lists the sorts of tasks involved in establishing a committee and a rail-trail. This is reproduced as **Appendix 11**.

It must be remembered that each corridor will have differing characteristics and the process may vary according to local conditions and issues. The sorts of steps which are suggested as being necessary to implement a rail-trails proposal in NSW are discussed below. Steps 3 and 5 would only be necessary if a decision was made to vest the disused corridor.

Stage 1 - Identify Opportunity: RTU in conjunction with rail authorities and State and local government members (or their representatives) determine the corridor status. This happens in WA. The potential disused corridor categories are 'abandoned', 'not-in-use', or 'not-in-service'.

Stage 2 - Expressions of Interest: RTU calls for Expressions of Interest (EOI) for a disused corridor. RTU then reviews these and selects a single or combined proposal which forms the basis for agreement to be negotiated between SRA and/or RAC or DL&WC for 'abandoned' lines. Brodie recommended that a competitive process should be used to determine private individual and group interest in use for non-rail uses but it is considered that widespread community consultation may be more appropriate.

Stage 3 - Vesting Plans: corridor is transferred from SRA to land management agency - if it is an 'abandoned' corridor. Plans for vesting are drawn up.

Stage 4 - COM Established: conditions for appointment of COM are negotiated between RTU and relevant bodies. Minister approves membership/appointment of COM.

Stage 5 - Vesting: of the corridor is formally endorsed by Minister, and Minister (through RTU) appoints COM. The reservation/vesting of the corridor is Gazetted.

Stage 6 - Concept Plan: public working document prepared by the COM, as a strategic guide and vision to future development and management and basis for a business plan. According to DCNR this plan can be a 10 step process (DCNR, 1994a), establishing how the COM should protect the trail's values and describing what will be provided. It also provides a timetable for actions. Refer **Appendix 11** for sample Concept Plan Format developed by DCNR in Victoria.

Stage 7 - Business Plan (Management Plan): the means of ensuring the vision becomes a reality. Identifies strategies in relation to funding and timing. It will assist in the sourcing of funds and/or loans and grants. In most of the experiences for rail-trails a master planning process has been undertaken, or is a statutory requirement. An example of this is Greenway-1 where a master plan and proposed plan of works were prepared to seek funding and guide works. It is a requirement under provisions of the Local Government Act in NSW that Management Plans are prepared for all areas under control of local government. Refer **Appendix 11** for sample Business Planning Process.

Stage 8 - Commence Development and Management: the COM begins development and management of the rail-trail.

Stage 9 - Monitoring and Review: with the benefit of monitoring and review, enhancements and refinements to rail-trails can be made. Monitoring can be by surveys of

users and the wider community. The trail system itself is inspected regularly to determine maintenance work required and to fulfil a duty of care to trail users.

According to Sustrans in the UK (DoT, 1982), project phasing should be undertaken so that the whole length of route is established as phase one, with landscaping, accessories, bridge improvements etc. provided later, rather than each stage being fully completed. The same approach is proposed for the Perth Bicycle Network Plan (Ker, 1996). This is being developed in three stages: firstly, establish the complete priority network; secondly, enhance this network; and thirdly, improve network density and provide grade separations for Principal Routes.

7.4.4 Implementation Actions for the Key Rail-Trails Opportunities

The initial tasks of a RTU will be to implement key proposals identified in **Table 8** below. The opportunities listed in the action plan are the six where case studies were developed.

Table 8 - Implementation Actions for Rail-Trail Case Studies

Corridor and Recommended Action	Key Agencies Involved *
RAILS-WITH-TRAILS	
Case Study No. 1 - North Arncliffe to Bardwell Park	
1. Form Working Group under direction of RTU to progress proposal & consult with all stakeholders to gain latest information	
2. Determine what, If any, modifications needed to rail amplification & resolve issue of shared maintenance access	RAC, RSA
3. Determine how best to integrate with Regional Park proposal and access to existing & identified bicycle networks	Rockdale & Canterbury Councils, NPWS
4. Determine how best to integrate with North Arncliffe and surrounding development	Rockdale Council, DoT, CityRail
5. Establish links to the Princes Highway and Cooks River cycleway	Rockdale & Canterbury Council, RAC, SRA
6. Develop a draft concept for a cycleway within the corridor & seek comment from stakeholders. Draft licence or lease agreements where necessary; develop a risk management protocol	RTA in conjunction with SRA and other stakeholders (including cyclist and community groups)
7. Obtain approvals, modify design work for amplification and construct the route in conjunction with works proposed	RAC/RSA, Construction Authority
8. Prepare & distribute promotional material and	RTA, Councils

Corridor and Recommended Action	Key Agencies Involved *
mapping information. Grand opening of facility	
9. Prepare maintenance schedule & monitor use. Modify facility or management where necessary	Rockdale & Canterbury Councils, RAC, RSA
Case Study No. 2 - Rhodes to Meadowbank	
1. Form Working Group under direction of RTU; consult with all stakeholders & gain latest information	Councils; RTA; DUAP; SRA, RAC
2. Finalise concept and costings for bridge decking and approach works; determine long term funding needs for disused bridge	RAC, RSA, heritage/ engineering consultant
3. Ministerial agreement on funding sources and long-term ownership of disused bridge	Ministers RTA, Transport, Public Works, Olympics, DUAP
4. Determine how best to integrate with Parramatta River Foreshore Improvement Program, Meadowbank wharf, Olympics 2000 opportunities and RTA sub-regional network planning	DUAP, OCA, DoT, RTA
5. Undertake baseline site survey & assessment	Concord and Ryde Councils, SRA
6. Resolve issues re shared maintenance access and access to and past Meadowbank station	Ryde Council, RAC, SRA
7. Develop a detailed draft concept for a cycleway within the corridor & seek comment from stakeholders. Draft licence or lease agreements where necessary; develop a risk management protocol	RTA in conjunction with SRA and other stakeholders (including cyclist and community groups
8. Obtain approvals, modify concept in light of consultation and construct the route in conjunction with works proposed	SRA, Construction Authority
9. Prepare & distribute promotional material and mapping information. Grand opening of facility	RTA, Councils
10. Develop maintenance schedule & monitor use. Modify facility or management where necessary	Concord and Ryde Councils
Case Study No. 3 - Waratah to Hanbury (Maud St)	
1. Form Working Group under direction of RTU; consult with all stakeholders & gain latest information	RTA, NCC, Newcastle University, RAC, RSA, Cyclists org.
2. Confirm opportunities for land purchase in Prince Street; defer construction of refuge in Maud St	Working Group, NCC, RTA

Corridor and Recommended Action	Key Agencies Involved *
3. Secure 'in-principle' agreement from RAC/SRA	RAC, RSA
4. Confirm funding sources; contracting; license and management arrangements	RTA, NCC
5. Undertake baseline site survey & assessment; determine geotechnical requirements for bridge abutment	RAC, SRA
6. Resolve issues re shared maintenance access	RAC and RSA, NCC
7. Develop a detailed draft concept for a cycleway within the corridor & seek comment from stakeholders. Draft license or lease agreements where necessary; develop a risk management protocol	Working Group in conjunction with stakeholders (including cyclist and community groups)
8. Obtain approvals, modify concept in light of consultation and construct the route in conjunction with works proposed	RTA, Construction Authority
9. Prepare & distribute promotional material and mapping information. Grand opening of facility	RTA, Council, SRA, RAC/RSA
10. Develop maintenance schedule & monitor use. Modify facility or management where necessary	NCC, RAC/RSA

RAILS-TO-TRAILS

Case Study No. 4 - Pippita - Sydney Olympic Park	
1. Form Working Group under direction of RTU to progress proposal	RTU, RTA, OCA, DoT, RAC/SRA, Councils,
2. Determine ownership of bridges and leasing arrangements	RAC/SRA, RTA
3. Determine feasibility and costs for extension of route alongside eastern (active corridor)	RTU; RAC; Strathfield Council; Landholders
4. Determine feasibility for access west via Pippita station site to Birne St and Lidcombe	RTU, SRA; Auburn Council; RTA
5. Identify and confirm funding sources	RTU
6. Resolve additional works required on Olympic site and Olympics 2000 requirements	RTU; OCA
7. Obtain necessary approvals & proceed to design and construct via tender process	RTU, with RTA/Council or OCA as construction authority
Case Study No. 5 - Picton to Mittagong	
1. Form Working Group under direction of RTU to progress proposal	RTU, SRA; RTA; Councils, community reps.
2. Clarify potential for conversion to trail Hill Top to	Working Group; RTU; RAC;

Corridor and Recommended Action	Key Agencies Involved *
Braemar & other adaptive re-uses	TRM
3. Concept further developed with the input of all stakeholders; then widely advertised	Working Group; plus stakeholder reps.
4. Prepare development proposal (including issues of shared use of corridor, funding sources and risk management)	Working Group; with assistance from RTU
5. Formally set up Committee of Management and transfer of leases	RTU, Working Group; SRA
6. Confirm funding and obtain approvals	COM, Approval authorities
7. Detailed design and construct first phase	COM, local volunteers
8. Opening and promotion	COM, Tourism NSW
9. Monitoring and maintenance	COM, volunteers
10. Enhancements as funding and local support dictates	COM
Case Study No.6 - Kandos to Rylstone	
1. Form Working Group under direction of RTU to progress proposal	SRA; Councils, community reps.
2. Clarify potential for re-activation and other adaptive re-uses proposed	RAC
3. Undertake trials to determine the feasibility of covering between the rails with gravel material	RAC, RSA
4. Concept further developed with the input of all stakeholders; then widely advertised	Working Group; plus stakeholder reps.
5. Prepare development proposal (including issues of shared use of corridor); including funding sources and risk management	RTU, Working Group
6. Formally set up Committee of Management and transfer of leases	
7. Detailed design and construct first phase	
8. Opening and promotion	
9. Monitoring and maintenance	COM
10. Enhancements as funding and local support dictates	COM, RAC

** in addition to Working Group &/or RTU*

7.5 Rail-Trails Management

It is difficult to anticipate all issues in relation to the management of rail-trails. A case-by-case approach will be required to deal with the particularities of each site. Nevertheless some general principles are discussed below.

The SRA has indicated that, for most situations, it would enter into a license agreement with the rails-with-trails manager for the land on which the facility is located. The most

appropriate agency to enter into a license agreement would generally be the local Council. The local Council would then become the project manager, possibly with funding and design advice from the RTA. RAC would need to approve any arrangements under its responsibilities for railway operations within the corridor. A separate agreement would have to be made with RAC where railway infrastructure was used (such as attaching a trail to a railway underbridge).

Where the trail was to be located on the outside portion of the corridor against its corridor boundary, thought would need to be given by the local authority to gaining a greater security of tenure through obtaining a freehold interest in the strip of land, or at least to obtaining a long-term lease. In this way council could incorporate use and landscaping of the trail with adjoining land holdings (eg. a park). Where a rail-with-trail traversed land surplus to SRA and/or RAC needs, transferring the land for use as a rail-trail might be achievable. This would remove all SRA or RAC liability for claims or maintenance.

Conditions of the lease would need to be negotiated between SRA or RAC and the Council, with the RTU providing advice. The conditions would need to ensure access to the trail by cyclists in all but emergency or exceptional circumstances. Current policy on leasing or licensing should be reviewed to ensure greater security of tenure for local councils constructing rail-trail facilities.

Responsibility for management and maintenance of the trail would rest with the local council, whilst the rail authorities would still be responsible for the maintenance of the remainder of the corridor, and for any activity that they undertook on the trail (for instance for shared maintenance use). Responsibility for maintenance of trails which lead directly past CityRail stations or through car parks may have to be determined on a case-by-case basis.

Monitoring

Monitoring is one of the most important tasks of facility management, but is often neglected. For instance, despite the significant amount of bicycle facilities constructed in NSW over the last few decades, the consultants are not aware of a single monitoring program being implemented or documented. The primary role of monitoring is to ensure that the facility is meeting its identified objectives. Monitoring is needed for:

- **safety and liability:** as a duty of care, identifies where trail maintenance is required to protect against accident or injury, and checks whether this maintenance has been carried out, particularly for major structures and trail surfacing
- **enhancement:** monitoring of the trail itself and its users can provide information as to where enhancement and improvement can be made, to better satisfy users and other stakeholders
- **profile:** monitoring of trail use can build up a case for additional funds or funds for other facilities, where actual benefits of the trail can be documented
- **statutory requirements:** control of noxious weeds and pests and fire hazard reduction is assisted by regular monitoring
- **trail protection:** monitoring can identify at an early stage any processes which may lead to erosion or deterioration

A monitoring program should be a key part in developing a management plan, and funds and resources need to be devoted to these tasks. For rails-with-trails facilities, monitoring should be included in the regular Council works program, and perhaps include in an overall monitoring program for parks and reserves and the local bicycle network. For rails-to-trails facilities monitoring needs to be included within the COM program, with monitoring tasks possibly devolved to smaller groups responsible for each management unit.

The RTU should make monitoring and reporting a requirement of any grant funding, to be carried out by the trail management agency. Monitoring data should be retained in a readily accessible format to assist in rail-trails development throughout the state.

Promotion of Rail-Trails Facilities

A key management task will be the promotion of rail-trails, both within the local community and within the region as a tourist and recreational resource. According to DoT (1982), and Scotland (1996), a rail-trail needs to be at least 12km long for it to attract recreational users in its own right. *"Measures to positively foster the popularity of routes should be an essential part of the development program."* DoT (1982). Positive actions to generate maximum use of rail-trails include:

- build smooth attractive paths
- hold public events
- organise guided trips
- have attractions along the route
- have special features such as static displays
- use adjacent land e.g. cafes and local shops

A commonly used and successful approach to the promotion of a rail-trail is the organisation of a mass bike ride on its opening day. This can be extended to the "Big" bike rides organised by Bicycle NSW, as well as endurance horse rides and sporting events where appropriate.

8 CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusions

Rail-Trail Benefits
Experience with rail-trails developed elsewhere is that they provide, economic, tourism, access and safety benefits. They have the potential to promote intra-community contact - particularly for communities on the urban fringe or in semi-rural areas.

Investigation of opportunities for rails-with-trails in the GMR shows that there is tremendous potential to enhance the bicycle network and to improve access to railway stations. Active rail corridors can be seen as a community assets - with use by non-motorised transport increasing their transport value.

There are a number of opportunities for establishing rails-to-trails in NSW. A few key proposals developed here have substantial community benefits and are likely to result in high levels of use of currently disused rail corridors.

Current Experience of Rail-Trails in Other Jurisdictions
Rail-trails have taken off in the UK and the US. Over 800 rail-trails have been established in the US, mainly through the activities of the RTC. In the UK, Sustrans have established thousands of km of rail-trails since the early 1980s. In both countries the major facilities experience use levels of over one million visitors per year. Victoria has now established 11 rail-trails over disused corridors, plus cycleways adjacent to active rail corridors. In Perth, a veloway system is planned to parallel the entire rail network, whilst a comprehensive network of trails is being established over disused corridors in the south west of WA, overseen by a Trails Council.

NSW Experience
Both the physical and political situation with regard to the development of rails-to-trails in NSW is quite different from other jurisdictions. Because of its sparser regional population densities , the alternative outdoor recreation opportunities available, and the fact that conversion of the rail formation is not possible in many cases, trails will be more difficult to establish in NSW on a comparable scale to say, Victoria. Establishing rail-trails may also be more difficult because of institutional and legislative factors. Nevertheless there are good reasons to explore any outstanding rail-trail opportunities in NSW.

Community Support for Rail-Trails
Experience world-wide demonstrates strong community support for rail-trails with some reservations on the part of train enthusiasts and adjoining landholders. Fears held by landholders generally dissipate once rail-trails are constructed and they see the benefits. Consultation conducted in the course of this study shows that there is enthusiastic support in NSW at the local council and community level - especially for rails-with-trails facilities which can assist in making utilitarian cycling an attractive alternative.

Safety of Rail-Trails
As documented in the report, particularly by the Kraich study (Kraich, 1996), perceived liability and safety risks outweigh actual impacts and risks - properly planned and constructed rails-with-trails are safe. What liability and safety concerns there are can be managed relatively easily. There appear to be no insurmountable safety and liability obstacles to providing cycleways along active corridors, providing there is adequate physical separation between users and the active line and proper attention to appropriate design principles.

Impact on Railway Operations
The main problem for rail authorities is the possibility that the rail-trail could interfere with maintenance. Rail operators may not always be enthusiastic about cycleways along active rail corridors. This is understandable given that encouragement of cycling is not seen as their core business. However, these issues need to be addressed in the light of the wider transport task.

Train Enthusiasts
There have been many proposals for tourist train use of disused railways but, with few exceptions, proposals have generally failed to survive beyond concept stage, especially where they run independently of other attractions. They tend to have limited use by a local community vs. potential regular local use of rail-trails. There is a need for rail-trail and tourist train proponents to jointly develop proposals and to work in tandem to manage disused corridors; there are probably not the resources in rural NSW for just one group to undertake adaptive re-use of a long corridor. Wherever possible rail-trail proposals should be developed to complement any current or proposed tourist train operations.

Rail-Trails Opportunities in NSW
There are a number of outstanding opportunities for active and disused rail corridors to provide the location for rail-trails. NSW has an extensive rail system, many areas of diverse and attractive countryside and infrastructure and heritage items still in place. However, potential rail-to-trail opportunities are more limited than in other States and overseas.

Congested urban road systems, and high traffic speeds provide incentives for rail corridors to provide links in bicycle networks. This is seen as the greatest area of opportunity compared with rails-to-trails, and this study has only been able to highlight a few key potential opportunities which exist.

Future Co-ordination of Rail-Trails Development
There is a need for a body to instigate and advise on cycleway and trail development in rail corridors and to establish appropriate design and management protocol. Such a body could be established through the staffing of a Rail-Trails Unit within the DoT.

Ownership and Management
There are a range of options which can be pursued. A license agreement between SRA and the relevant local Council is most likely to meet the requirements of rail authorities and users. A ‘community lease’ arrangement is probably not suitable given its short-term nature

and the ability of the lessor to terminate without notice. This is unlikely to encourage the dedication of resources necessary for the construction of rail-trails.

Implementation
Proposals work best when there is public "ownership" supported by resource allocations from government and other appropriate organisations.

8.2 Recommendations

The consultant makes the following recommendations with regard to rail-trails in NSW:

1. **Implementation of Rail-Trail Projects:** that a funding initiative be developed to instigate identified high priority rail-trail opportunities as 'demonstration' projects in urban and rural NSW prior to 2000. An amount in the order of $3.5 million over the next three years would be required. A suggested theme for the initiative is: "Pathways to the Next Millennium".

2. **Development Guidelines and Risk Management:** that a risk management protocol be established, and guidelines be prepared to assist in rail-trails development.

3. **Have Development Plans Ready:** that where there are opportunities for rail-trails, concept and development plans be prepared in advance and ready to go, so that projects can capitalise on funding when it is available. It is recommended that plans for all of the 'moderate to high priority' opportunities investigated in this study be developed in the first instance.

4. **Integrate with Transport Network Developments:** that future rail corridor works in NSW consider opportunities for the inclusion of cycleways/pathways, and examine the impacts which works may have on potential provision. There should also be improved integration between the rail authorities, DoT and RTA to facilitate connections between the on-road and off-road network and to make the best use of opportunities provided by major transport infrastructure schemes for non-motorised transport. This could occur along the lines of the Perth Bicycle Strategy - Action 11.3 *"Westrail will make provision for Principal Transport routes in any modification planned or made to the extent of the existing rail reserves, the layout of activities within them or land reservations for extension of the suburban rail system"*

5. **Co-operation between Interest Groups:** that the various stakeholders should work co-operatively in the development of rail-trails to maximise resources for adaptive re-use of a corridor and to undertake joint promotion and marketing on the rail-trails theme. A 'rail-trails' workshop should be held to bring together community interest, Government agencies and politicians.

6. **Rail-Trails Unit to Co-ordinate Action:** that a specifically funded and permanent unit be set up to investigate, review and provide policy advice on rail-trails. A Rail-Trails Unit within the DoT is suggested in the initial phase. This Unit should liaise

closely with the various other stakeholders. Funding of a full-time officer equivalent plus support will need to be provided to establish such a unit.

7. **Corridor Protection and Review:** that the NSW Government ensure that rail corridors (in both private and public ownership) presenting rail-trail conversion opportunities remain intact and are not split up or sold to private owners.

8. **Review of Existing Legislation and Policy:** that the potential for changes to the Transport Administration Act 1988 be investigated, to more easily allow for the adaptive re-use of disused rail corridors. Adaptive re-use should be allowed within the legislation so long as the corridor remains in public ownership and its use results in wider community benefits.

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APPENDICES

Appendix 1 - Extract from ISTEA

Appendix 2 - Sample Result from Internet Search

Appendix 3 - Summary of Responses from Consultation & Authorities Contacted

Bicycle User Group	Comments
Toukley & District Cycle Club	- Main Northern Line corridor looks inviting but might want to add extra track - concerns raised re personal security - No opportunities identified
Bicycle User Group of Fairfield Holroyd	- Believes that use of the rail corridors is a practical solution to creating a viable cycle network - Suggestions made regarding use of Military Road on western side of rail line between Yennora Station and Pine Road. - Recognise cycling encouragement, health and environmental benefits and therefore support this study.
Southern Highlands Bicycle Users Group	- In favour of rail-trail concepts raised in general terms. - Suggest use of rail corridor between Bowral and Moss Vale (2km section between Wingecarribee River at the Southern end of Railway Parade Burradoo and the Northern end of McCourt Rd Moss Vale. On the Eastern side of the Main Southern Line) - Benefits include safe commuter link, recreational cycling opportunities and expansion of the local path network. - A survey of households in the area identified the need for such a link.
Banana Coast All-terrain Cyclists	- Generally sounds very feasible in certain areas - regards as highly unlikely that DoT would consider using the North Coast rail corridor considering security fencing in place - Benefit to the community in constructing a walkway/cycleway attached to the rail bridge spanning Coffs Creek.
Bike North	- Provided both summary and detailed submission - Using the corridors will give life to bike plans and will make cycle network more readily viable - Gives cyclists an off-road place to avoid heavy traffic - Using the rail corridor would provide a better grade than on-road cycle routes. - Rail corridor from Asquith to Milsons Pt and from Hornsby to Meadowbank with extensions to Strathfield have potential which is worth investigating in a more detailed study - Benefits to the community are identified - Regarding safety, suggests consultation with Bikewest re Veloways - Does not believe liability is a problem for the rail authorities if effectively managed - Suggests measures to minimise conflicts with railway operations
Kuring-gai Cyclists	- Similar proposals to Bike North - Interested in providing a more detailed submission - Suggests feasibility study costing approx. $30,000.
Pacific Power Bicycle Users Group	- In general terms the User Group is strongly in favour of the proposed concept - The proposal offers the potential of a safe, direct, and relatively flat route - Could result in benefit of a switch from trains and cars to bikes - Proposal should encourage increase use of the bicycle as a viable commuting vehicle - Cites the needs for end of trip facilities - Strongly urges that East Hills rail corridor works are targeted for such proposals and linking suburbs along this route to the Ryde to Botany Bay cycle route - Use of corridors must allow for adequate exit and entry points and effective separation for the safety of younger users - Proposals need to be well planned to provide real commuting potential

Cyclist Action Movement West (CAMWEST)	- Suggests serious consideration be given to the provision of cycling access within the rail line corridor for the amplified East Hills railway - Suggests shared use of the East Hills maintenance tracks - This proposal would be a great boon to local cyclists since other options are becoming increasingly difficult and hazardous
East Coast Touring Cycling Club	- Concept would provide uninterrupted routes for cyclists, most corridors unattractive so would keep pedestrians away - Maitland to Newcastle is very suitable - Tremendous community benefit in terms of safety and health - Believes little conflict with rail operations as most access roads are wide enough. - Stupid to talk about safety as trains stay on the track compared to cars who drive all over the road - Suggests the Maitland to Newcastle line could be used to Tarro, underpass under the highway and using the water pipeline to Sandgate then rejoining the railway corridor. This would be a commuting and recreational cycleway - Little has been done with the dismantled railway lines, these may be too disjointed to provide direct routes and cut off by housing developments
Greater Lithgow and Blue Mountains Cyclist Action Group (GLADBAG)	- Think the concept is an excellent idea. Identified 3 potential opportunities: East Portland with Portland using disused rail corridor - At Lithgow a recreational route taking in the blast furnace site; and the active railway corridor from Lithgow to Wallerawang would provide much safer route for cyclists - These ideas to be incorporated into the proposed bike plan for the area.
Association of Railway Preservation Groups (NSW incorp.)	- In-principle support for establishment of cycleway network within the urban area as being a worthwhile environmental objective and complementary to rail passenger services - See potential problems with cycleways sharing rail corridors in urban areas owing to the frequency and speeds of operation. Referred to CityRail fencing as a response to these problems - Supports development of multi-use recreational trails providing they in no way involve the removal of any infrastructure and providing they in no way impede or prevent the reintroduction of rail services at a future date - Suggests use of access tracks as bases for cycleways. If their boundaries clearly marked there should be no conflict with either current or future rail operations. May need fencing if immediately adjacent to the railway line - Area of liability which causes the Association the greatest concern. See this as part of the general trend a person's responsibility for their own actions being transferred to someone else
ACROD Ltd] (Australian Council on Disability)	- Provided a number of key contacts in NSW - Provided sources of information. - Thanked consultants for contacting them and for considering the needs for people with disabilities as potential users

Authorities Contacted

Office/Name/Title	
Dept. Transport - Planning Branch	**DL&WC**
Matt Faber - Manager Network Structure	Carl Malmberg
Karen Wyatt - Transport Planning Officer	Stan Rees
Phil Simpson	**COUNCILS**
Olympic Co-ordination Authority	**Newcastle City Council** - Bob Henry
Bob Leavens	**Lake Macquarie** - Ken Freeson

Roads & Traffic Authority	**Wagga -** Kiralie Houghton
Steve Soelistio - Manager Bike Unit	**Griffith -** Ken Wilson - Man Forward Planning and Design
Mike Dowd - Manager Network	**Gundagai -**
Wollongong Zone - John Kemp	**Strathfield -** Danny Jones
Wagga Zone - Peter Hirst	**Ryde -** Tony Reid /Barry Hodge
Brad Donaldson - Sydney Region	**Concord -** Peter Macdonald - General Manager
STATE RAIL	Lewis Oldfield
Rail Estate Frank Boland - Property Services Manager	**Local Government & Shires Assoc**
Grant Fraser - Property Operations Manager	**Australian Trust for Conservation Volunteers**
John Collins - Property Transfers	**OTHER STATE**
Keith Dunbar - Rail Estate	**WA Ministry of Sport and Recreation** Russell Small -
John Benniss -	Trevor Wallace Information Centre
David Frame	**Westrail -** Andrew Cartlege -
Heritage Don Ellesmore - Manager Heritage Unit	**WA Dept. of Transport -** Peter Martinovitch - Man. Urban Transit
CityRail	**Bikewest -** Mike Maher
Margaret Prendergast - Manager Transport Planning	Peter Ryan - Planner
Countrylink Claire Pennington - Product Dev	Vindah Singh
Roger Mika - Operations Manager	**VIC Dept of Cons. & Natural Resources** Sue Halstead-Lyons - Outdoor Information Centre
RAIL ACCES CORP	**Public Transport Corporation VIC** David Paterson - Manager Engineering Development
David Knox	**Disability Council of NSW -** Executive Officer
Pauline Hogan - Manager Rail Access Marketing	**STAKEHOLDERS**
Mick Watts - GM Olympic Rail Link	Jeff Hunter MP - Helen Senior Electorate Officer
Ron Bruce - senior asset manager	**Bicycle NSW -** Warren Salomon Manager
Peter Hicks - Asset Manager	Eva Gerencer - Campaigns Officer
Shane Mair	Owen Heldon
Steve Alchin - Network Assets	**CAMWEST -** Ian Macindoe
Greg Beasley	**NCM -** Eslpeth Cooper & Sue Brad
Bruce Lord - asset manager south and west	**Bike North -** Neil Tonkin/Sue Saczko
Luke Fisher Deputy	**Equitrek -** Melly Gelich - Director
Trevor Harvey - assets	**ACROD -** Helen McAuley - Director
Terry Hatton - safety	**Australian Quadriplegic Assoc.** Mark Elf
RAIL SERVICES AUTHORITY	**3801 Limited -** Tony Gogarty - General Manager
Environmental Services Unit Jim Longworth- Natural Resources Manager	**Assoc. of Railway Preservation Groups** Gil Wheaton - Secretary
FREIGHTRAIL Bruce Hall - Gen. Man Operations	**Australian Rails to Trails -** Mark Plummer - President
Alan Cavanagh	**Rails-to-Trails Conservancy (USA)** Andy Clarke - Trail Development & Communications
Tourism NSW	**Bicycle Victoria-** Bill Potiris
Alan McGuigan	**Warburton RailTrail -** Liz Tunnecliffe
Dept Urban Affairs & Planning	**NPWS**
Eva Cermack, PRFIP	Geoff Francis - Manager Field Services

Appendix 4 - RTC Facts Sheet and Information Sheet

Appendix 5 - Rail Trails in NSW

Apparent Rails-with-Trails in the Sydney Area

Rails-to-Trails Known to be Established in NSW
(Source: table prepared by Jim Longworth, November 1996, for inclusion in the *Australian Rails to Trails Newsletter*)

LINE	**NOTES**
Bargo - Nepean Dam	private Sydeny Water access road
Colo Vale - Hill Top	public road
Como	ex-railway bridge - sealed cycleway
Crawfoprd R - Purgatory (near Bulahdelah)	forestry road
Fassifern - Toronto	sealed cycleway
Gian Landslide - Ruined Castle (near Katomba)	walking track
Lapstone	ex-zig zag and nearby construction line - public road, walking track
Hartley - top of incline	walking track
Penrith	ex-railway bridge - public roadway
Newnes Junction - Newnes	35km roadway, plus 12km walking track
Richmond - North Richmond	public road and bridge over Hawkesbury River
Stanwell Park	public road
Nowra	ex-railway bridge - public roadway
St James (tunnels)	walking tunnels
Swifts - Burrinjuck Dam	public access road
Thornleigh - quarry	old Thornleigh zig zag - walking track
Waterfall - Stanwell Park	walking track
Welby - Box Vale	unsealed cycleway, horse pad, walking track
Wynarard - Argyle (tunnels)	underground car park

Rail-Trails in NSW - Extract from "Australian Rails to Trails" Newsletter

Appendix 6 - Sample of NSW Bicycle Network, and Regional Routes Mapping

Appendix 7 - Advertisement Expressions of Interest for Disused Rail Lines

Appendix 8 - Executive Summary - Survey of Rails-with-Trails: Kraich (1994)

Appendix 9 - Extract from Trailswest Report Regarding Liability

Appendix 10 - Concept Costings For Key Sites

Concept Costings for Case Study No. 1 - North Arncliffe to Bardwell Park

ITEM	UNIT COST	COST
Refuge crossing Hartill-Law Ave. to cycleway and connecting ramps	item	$10,000
Pathway 3m width Hartill-Law Ave. to Henderson St - 3m width AC surface, 150mm base with concrete edging 1300m	$30 sq.m	$117,000
Modification to proposed new Bardwell Creek railway bridge to add cycleway	(to be determined)	N/A
New cycleway/pedestrian bridge across Wolli Ck adjacent Amy St - 25m span	$2,000m	$50,000
Reinstatement of existing pedestrian bridge to Henderson St.	estimate	$20,000
Henderson St on-road section line-marking / logos 600m	$5/m	$3,000
Veloway 2.5m width Henderson St to North Arncliffe - AC surface, 150mm base with concrete edging 300m	$25/sqm	$37,500
Connection alongside sewer main to Lusty St. - 30m concrete pathway 3m width	$100/sqm	$9,000
Signage x 10 installed	$200 each	$2,000
Fencing to rail corridor - relocated by RAC as part of rail amplification		N/A
Lighting - standard every 50m plus cabling x 30 sets	$500	$15,000
Landscaping say 0.5ha total	$100 sq.m	$50,000
SUB-TOTAL		$313,500
Design/Construct fees (4% plus 10% contingency)	item	$43,890
Maintenance & lighting -10% cycleway capital cost	item - 10% of $263,500	$31,350
TOTAL		**$388,740** **say $400,00**

Notes: an overbridge and pathway from North Arncliffe to Waterford Park has not been costed. If this was to be built it is suggested that it be provided as part of the development of the Wolli Regional Park and Interchange upgrade. The provision of a new pedestrian bridge across Wolli river Creek should be costed partly from Wolli Regional Park development

Concept Costings for Case Study No. 2 - Rhodes to Meadowbank

ITEM	UNIT COST	COST
Connecting ramp south end to Walker St - RC 100mm x 3m width - 30m	$100 sq.m	$9,000
Decking to disused bridge - fibre reinforced plastic grid flooring - 4m width x 250m *	$300,000 item	$300,000
Fencing/handrails to bridge - 1.3m high x 300m both sides	$50 linear m	$30,000
Cycleway ramp RC x 3m wide down to Meadowbank Wharf - 50m	$120sqm	$18,000
Pathway 3m width nth Bridge abutment to Hermitage St - AC 40mm surface, 150mm base, with edging - 900m	$40 sq.m	$108,000
Upgrade existing gravel railway service track Railway Rd to nth abutment as alternate/emergency route - 250m	$20m	$5,000
Enlarge corridor - cutting back of sandstone - 200 m^3	$50 m^3	$6,000
Ins tall/relocate fencing (1.8m chain link mesh) - nth abutment to Hermitage Rd 900m	$25/m	$22,500
Road crossing and chicanes at 3 locations (Meadowbank station x 2, Hermitage Rd)	$1,000	$3,000
Signage x 6 installed	$200 each	$1,200
Lighting - standard plus cabling x 10 sets	$500	$5,000
Landscaping say 1.0ha total	$100 sq.m	$100,000
SUB-TOTAL		$607, 700
Design/Construct fees (4% plus 10% contingency)	item	$85,070
Maintenance -10% cycleway capital cost	item - 10% of $249,600	$60,700
TOTAL		$753,478 say **$750,000**

Note: A number of short term preservation works to the bridge and abutments was recommended in the Meadowbank Rhodes Railway Bridge Conservation study (Sinclair Knight Mertz, 1996). The cost of this work is not known at this stage.

Concept Costings for Case Study No. 3 - Maud St Newcastle

ITEM	UNIT RATES	COST
Remove 2 rows gabions adjacent to bridge abutment; restore abutment	item	$30,000
Construct boardwalk 3m width and handrails to 1.3m x 50m length	$450/m	$22,500
Fencing 1.8m high /2 gates - 500m, shade cloth over 150m length 2 double gates	$25m plus $5m lineal m shade cloth gates $1,000 per double gate	$17,000
Construct RC pathway 2.5m width to NCC standard x 300m	$100 sq.m	$70,000
Install set of signals - amber flashing, plus detectors (for vehicles only)	TBA	say $15,000
Night lighting at bridge and shared zone x 6 sets	$500 each	$3,000
Landscaping for purchased land	item	$10,000
Provide new access road and fencing to Prince St. - 50m	$45sqm plus fencing	$6,750
Sealing of shared zone - AC 40mm over existing road - 3m wide x 200m	$20sqm	$12,000
Sign-posting/warning signage installed x 5	$200 per sign	$1,000
Fencing to catch falling stones - 1.0m high x 100m length	$17.50 lineal m	$1,750
SUB-TOTAL		$226,200
Design/Construct fees 4% plus contingency10% construction costs	14% of $226, 200	$31,668
Maintenance	10% capital cost	$22,600
TOTAL		$280,468 say **$280,000**

Concept Costings for Case Study No.4 Pippita to Sydney Olympic Park

ITEM	UNIT RATES	COST
Decking surfaces in concrete to both bridges 4m wide - 50m total length	item	$160,000
Cycleway ramp connecting south abutment to Parramatta Rd footpath - 3m wide x 50m	$100sqm	$15,000
Pathway along formation (assumes well compacted base) - south abutment to Avenue B - 4m width x 300m	$20sqm	$24,000
Refurbishment trestle bridge across Parramatta Rd (including paint treatment) and guard rails (refer note below)	item	$300,000
Bridge refurbishment girder bridge across M4	item	$80,000
Widening of footpath by 1.0m along 200m section Parramatta Rd (possibility only at this stage - to be confirmed)	$45 per m	
Stairway west side of abutment Parramatta Rd	item	$10,000
Signage x 10 signs installed	$200 each	$2,000
Night lighting x 10	$550 each	$5,500
SUB-TOTAL		$605,500
Design/Construct (7.5% plus 10% contingency)	item	$84,770
Maintenance 10% capital cost	item	$60,550
TOTAL		**$750,820** **say $750,000**

Concept Costings for Case Study No.5 - Picton to Mittagong

ITEM	UNIT RATES	COST
Upgrade existing service track Thirlmere to Colo Vale as multi-use rail-with-trail - 19km	$2,000/km	$38,000
Pathway Colo Vale to Braemar - crushed gravel pathway and geotextile over ballast and sleepers - 4km	$12/m	$48,000
Cycleway Braemar to Mittagong 2m wide AC surface, 150mm base with concrete edging - 1.5km	$20 sq.m	$60,000
Road crossings at grade - 6 locations	$1,000	$6,000
Bridge repair and handrails for 2 timber trestle bridges	$10,000 each	$20,000
Fencing 1.5m high - 1km in total	$25/m	$25,000
Directional and information signage - 10 signs	@ $200	$2,000
Signage x 10 signs installed	$200 each	$2,000
SUB-TOTAL		$201,000
Design and Development Plans (4%) plus 10% contingency	item	$28,140
Maintenance - assume 10% of capital cost	10% of $201,000	$20,100
TOTAL		$249,240 say **$250,000**

Concept Costings for Case Study No.6 - Kandos to Mudgee

ITEM	UNIT RATES	COST
Cycleway Kandos to Rylstone crushed gravel pathway and geotextile over ballast and sleepers - 12km	$12/m	$144,000
Establishment of a multi-use trail over the existing service track Rylstone to Mudgee - 51km	$2,000/km	$102,000
Rylstone to Mudgee - gravel over ballast and sleepers for steeper terrain - assume 10 sections @ 100m = 1km	$12,000km	$12,000
Bridge repair for 3 corridor timber trestle bridges.	$10,000 each	$30,000
Fencing repair - say 2km in total	$6,000/km	$12,000
Directional and information signage - 10 signs	@ $200	$2,000
Road crossings - signage and wait rails at 10 locations	$1,000 each location	$10,000
Signage x 10 signs installed	$200 each	$2,000
SUB-TOTAL		$314,000
Design and Development Plans (4%) plus 10% contingency	item	$43,960
Maintenance - assume 10% of total costs over 10 year period for 63km of corridor	$100/km p.a.	$63,000
TOTAL		$420,960 say **$420,000**

Appendix 11 - Summary of Concept and Business Plan Steps ((from DCNR)