

New England Rail Trail

Trail Plan



NEW ENGLAND RAIL TRAIL TRAIL PLAN



Prepared by



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EXECUTIVE SUMMARY AND RECOMMENDATIONS

EXECUTIVE SUMMARY

This Trail Plan focusses on the disused railway corridor between Armidale and Glen Innes. Its purpose is twofold:

-  The report provides a strategic assessment of developing a rail trail on the disused railway line from Armidale to Glen Innes. This strategic assessment includes a canvassing of issues and opportunities that are relevant to the **entire 103 km corridor** as well as a business case for both the long trail (Armidale to Glen Innes) and the short trail (Ben Lomond to Black Mountain). The report sets out indicative works items and cost estimates for the northern-most (Ben Lomond to Glen Innes) and southern-most (Armidale to Black Mountain) corridor sections based on a broad overview of the corridor. These works items have been informed by fieldwork on the corridor but not a detail assessment of precise works items and locations.
-  The report provides a detailed set of activities for the progressive construction of a trail on the disused railway corridor from Ben Lomond to Black Mountain.

STRATEGIC ASSESSMENT – ARMIDALE TO GLEN INNES

ISSUES

A project of this magnitude is not without a number of issues. None of these are insurmountable, but consideration has been given to these issues.

Corridors in farming areas. The corridor under consideration passes through a range of rural landscapes. The section of the corridor that has been subject of detailed study (Ben Lomond to Black Mountain) is generally surrounded by constructed roads, either on one side or both sides. This reduces the potential for adjoining landholder management issues (though there will be some issues). This feature also means that access to the corridor for construction is relatively easy and thus comparatively inexpensive. The “remote” nature of the corridor along the other two sections (Armidale to Black Mountain, and Ben Lomond to Glen Innes) means that it passes through a higher proportion of land that is actively farmed with landholders on both sides of the corridor presenting a range of issues around farm management and construction access. The general issues usually raised by landholders are dealt with in the endorsed NSW Government position as laid out in the *Strategic Risk Assessment – Biosecurity Risks Associated with Rail Trails*.

Rivers and creek crossings. Bridges are one of the most obvious reminders of the heritage value of disused railways, one of the most significant attractions of trails along disused railways and also one of the costliest items in the development of trails on former railways. The corridor between Ben Lomond and Glen Innes has 16 timber bridges ranging from very short (in the order of 5 metres) to quite substantial (including the 120 metre bridge over Beardy Waters). Re-use of these bridges will be a significant undertaking. Bridges and their re-use or replacement is not a significant issue along the corridor from Armidale to Ben Lomond.



Railway bridges, even though some will require work to be suitable for trail use, are one of the main features that make rail trails so appealing to such a wide range of user groups.

Ongoing legislative issues. There remain key legislative obstacles to the development of rail trails in NSW. The NSW Government has committed \$5 million funding to the proposed Tumbarumba Rosewood Rail Trail (part of the Wagga Wagga to Tumbarumba line) as a 'pilot' project – part of the pilot project will address the legislative barriers. There also appears to be elements of a pilot project in the development of the Northern Rivers Rail Trail.

Pilot project assessment. The NSW Government is proceeding with pilot rail trail projects on two corridors. It is not clear what criteria the Government will use to determine the success of the projects. There has been some discussion amongst the proponents of this project as to whether, and how, this project may qualify as a pilot project. If it is used as a pilot project, there needs to be some caution exercised around visitor numbers who may be attracted to this trail. A shorter trail (Black Mountain to Ben Lomond) has the potential to attract a number of users. However, the longer trail (Armidale to Glen Innes) has the potential to attract a larger number of users (for a range of reasons).

Reinstating train services on the rail corridor. There are some members of the broader New England community who have expressed a desire to see passenger train services reinstated on the railway corridor north of Armidale and who consequently oppose the rail trail project, fearing the opportunity to reinstate rail services will be lost if the rail trail proceeds. The NSW Government has clearly indicated that the railway corridor will remain in public ownership should it be needed for another community purpose in the future. Reinstatement of a railway line will remain possible as the land will stay as public land. Given that a railway service has not been in operation for over 30 years, it is hard to envisage circumstances under which it would return.

OPPORTUNITIES

There are a number of specific elements within the area encompassed by the proposed trail route that provide opportunities and reasons for why a trail should be built.

Appealing landscapes and infrastructure. The New England Rail Trail would pass through some very attractive scenery. There are interesting and varied landscapes on the section between Armidale and Black Mountain, particularly north of where the trail goes underneath Booralong Rd. The landscape between Ben Lomond and Glencoe in particular (also between Glencoe and Glen Innes) is very attractive and quite spectacular. There are great panoramic views afforded in sections, often due to very high and stunning embankments. While the landscapes between Black Mountain and Ben Lomond are perhaps a little less attractive, they do provide wonderful rural vistas with sweeping views of skyline. The attractiveness of these quintessential rural landscapes to city dwellers in particular should not be underestimated. The quality of intact railway heritage such as switches, signals and mile pegs is very high (both of the restored and the unrestored infrastructure). The quality of the railway station is outstanding and is possibly represents the highest quality of restored and maintained railway stations along any substantial stretch of disused railway corridor in NSW.

Topography of the preferred route. One of the major appeals of rail trails is the gentle gradient, suitable for all types of cyclists, and walkers (gradient is typically less of an issue for horse riders). This is the market that would be attracted to a rail trail.



The corridor between Armidale and Glen Innes contains a wonderful array of railway infrastructure including railway stations, signals and switches, cuttings and embankments, mile pegs and other signs – all of which are appealing to potential rail trail users.

The instantaneous appeal of the Glen Innes corridor. The rail corridor immediately south of Glen Innes Railway Station provides a “best of” rail trail within a very short length. Within the first 5 kilometres heading south of Glen Innes station, users can see a high-quality station, historic railway infrastructure (signals, switches, etc), cuttings, embankments, timber bridges and a brick underpass – all features which clearly distinguish a rail trail from other sorts of recreational trails.

Connections between towns. The trail will make an actual connection between the towns en route (whether it is a shorter rail trail or the longer rail trail) – one that reinforces historic connections. The distances between towns is also important when considering likely users. The good one-way trails often provide opportunities for short, medium and long length rides and walks on the main trail. Towns and villages along this corridor are well located, particularly in terms of bike riding, while the whole length (103kms) provides for a very attractive 2 - 3 day ride.

A trail with anchors at both ends. One-way trails (or out-and-back trails) need an anchor at both ends to be attractive to users. The best one-way trails (including many rail trails) have natural terminuses in major centres or towns or pass through major towns. This is particularly an attraction for the longer corridor (Armidale to Glen Innes) with easy access to Armidale in particular (by car, train and plane). While neither Black Mountain nor Ben Lomond are major towns, the attraction of towns at either end is an incentive for trail users. Trail development may spur development of new businesses in these towns.



The corridor between Black Mountain and Ben Lomond contains several impressive cuttings and stands of vegetation and they contribute to the varied and at times spectacular scenery.

Broadening the recreation offerings. Provision of an additional off-road trail adds to the list of tourist offerings in the New England region and encourages visitors to stay a little longer to go for a pleasant walk or ride. A new nature-based attraction has the power to retain those visitors for longer, spending money and generating business opportunities. Natural assets that are utilised for outdoor recreation are found in the region; adding a rail trail to that list will encourage more visitors looking for that type of experience. Armidale already has a relatively strong cycling culture (both urban and touring). Glen Innes Severn Council has expressed an interest in developing a better cycle network within Glen Innes. A rail trail would add significantly to both these existing opportunities and cultures.

Delivering on agreed community outcomes. The NSW Government, Armidale Regional Council and Glen Innes Severn Council have prepared a number of community, planning and economic documents in recent times outlining a range of goals, objectives and actions. Developing a rail trail on the corridor delivers on a number of these goals, objectives and actions particularly in regard to economic development, developing attractive communities and ensuring healthy communities.

BUSINESS CASE

It is always difficult to predict the economic impact of a new trail. Visitor numbers on the Bibbulmun Track (in WA) grew from 10,000 when the new alignment was first opened in 1997 to 137,000 in 2004 (*Colmar Brunton 2004*) to over 167,000 in 2008 (*Colmar Brunton 2009*). Visitors included those on 'local trips', day trips and overnight or longer stays (including those who travelled from end to end).

A dramatic increase in visitor numbers such as experienced by the Bibbulmun Track can be, in part, attributed to very good marketing of the track. The economic impact of the proposed New England Rail Trail is primarily dependent on the extent to which the trail is marketed and promoted (if it proceeds).

A trail such as the New England Country Rail Trail will have attraction to visitors – day-trippers and overnight visitors. However, it will also provide for local residents of towns and villages along the route. Some of these people will use the trail for exercise – these 'back gate' users may not be significant in terms of expenditure, but they are significant in terms of numbers as they would use the trail many times a year.



Some of the landscape which the proposed rail trail would pass through between Ben Lomond and Glen Innes is spectacular and would appeal to thousands of potential users.

With the right marketing, either trail (the short trail and the long trail) will attract local users, day-trippers and visitors. Under a relatively conservative scenario, the following outcomes are achievable:

New England (Ben Lomond to Black Mountain) Rail Trail

Under a relatively conservative scenario, the following outcomes are achievable:

- ✚ Significant local use (in terms of relative proportions of the population) – almost 10,000 local users/year is a reasonable expectation. This will result in an economic injection of \$21,414/year;
- ✚ Expansion of the existing day tripper market to the region. 5,000 new day trippers/year will yield an injection of \$508,800/year.
- ✚ With a new significant recreation attraction, some day-trippers may stay overnight, generating a new income stream. If the trail converted 2,000 day trippers into overnight visitors, this would inject an additional \$345,860/year into the economy.

- ✚ If 2,000 visitors stay an extra day to use the trail (or use a package of trails including the New England Rail Trail), an additional \$345,860/year injected into the economy.

The total injection of dollars into the local economies from local, day trip and overnight visitors may be of the order of \$1,221,934/year (under a range of conservative scenarios). Complex economic analysis (beyond the scope of this project) is needed to determine how many jobs are likely to be created by such expenditure.

New England (Armidale to Glen Innes) Rail Trail

Under a relatively conservative scenario, the following outcomes are achievable:

- ✚ Significant local use – almost 35,000 local users/year is a reasonable expectation. This will result in an economic injection of \$75,136/year;
- ✚ Expansion of the existing day tripper market to the region. 10,000 new day trippers/year will yield an injection of \$1,017,600/year.
- ✚ With a new significant recreation attraction, some day-trippers may stay overnight, generating a new income stream. If the trail converted 2,500 day trippers into overnight visitors, this would inject an additional \$432,325/year into the economy.
- ✚ If 2,500 visitors stay an extra day to use the trail (or use a package of trails including the New England Rail Trail), an additional \$432,325/year injected into the economy.
- ✚ A long trail highlighting the best of the New England Region would attract new visitors to the region solely (or primarily) to do the trail. An additional 5,000 visitors would inject \$2,593,950/year into the local economy.

The total injection of dollars into the local economies from local, day trip and overnight visitors may be of the order of \$4,551,336/year (under a range of conservative scenarios).

Complex economic analysis (beyond the scope of this project) is needed to determine how many jobs are likely to be created by such expenditure.

It should be emphasised that user numbers will not necessarily be realised in the first years of operation if the trail proceeds (particularly if the trail is constructed in sections). The Bibbulmun Track took ten years to reach 167,000 trips from an initial base of 10,000.

The trail offers a range of new business opportunities and the opportunity for existing businesses to extend their offerings. The trail has the potential to improve the sustainability of businesses reliant on tourism. The completion of a trail would not simply provide an injection of funds to stabilise and grow existing and new businesses. The psychological impact on businesses can also be very important; businesses operating around other rail trails believe the trails have contributed to their businesses as well as helping to position their area as an authentic leisure holiday destination.

The trail provides a number of less quantifiable benefits. These include:

- ✚ Health-related benefits to the wider economy. Data from the USA indicates that every \$1 of funds spent on recreational trails yield direct medical benefits of \$2.94. The trail will encourage people to exercise – the economic benefit to society of getting an inactive person to walk or cycle is between \$5,000 and \$7,000/year. Medical research has shown that 1 hour of moderate exercise can add more than 1 extra hour of high-quality life to an individual.

- ✚ Rail trails are an accessible form of recreation. Trail-based recreation is generally free, self-directed and available to all people, all day, every day. Good quality, accessible trails encourage physical activity and improved health. Increasing recreational options for local communities will aid overall community wellbeing. The psychological health benefits of trails remain under-estimated.
- ✚ Quality recreational facilities, such as trail networks, can help create attractive places to live and visit. Walking and cycling are relatively cheap modes of transport. Trails also provide a low impact means of travelling through the landscape and play an important role in connecting people with nature.
- ✚ Trails present a unique opportunity for education. People of all ages can learn more about nature, culture or history along trails. Trails have the power to connect users to their heritage by preserving historic places and by providing access to them. They can give people a sense of place and an understanding of the enormity of past events. The railway museum at Black Mountain would add to this sense of history if it was accessed by rail trail users.
- ✚ Trails provide a number of environmental and cultural benefits including opportunities for the community to experience natural and cultural environments, increased community ownership which helps to preserve natural and cultural values, and opportunities for community participation in conservation and revegetation work.

COSTS

The costs of construction of the proposed New England Rail Trail are an estimate of probable costs only. Accurate costs can only be determined, firstly, by the compilation of more detailed works lists accomplished through individual, detailed trail development plans for each section of the proposed rail trail and, secondly, via a tendering process.



The 120m timber bridge over Beardy Waters will be expensive to upgrade for trail use but will be a major feature and attraction for people to come and enjoy the proposed rail trail.

The estimated detailed cost of converting the rail corridor between Armidale and Black Mountain is \$6,438,310 (excluding GST). The estimated detailed cost of converting the rail corridor between Ben Lomond and Glen Innes is \$11,107,230 (excluding GST).

TRAIL DEVELOPMENT PLAN – BEN LOMOND TO BLACK MOUNTAIN

This report sets out a comprehensive works list for each of the proposed stages of the rail trail development between Ben Lomond and Black Mountain. It includes an estimate of probable costs for each task. These works items have been informed by detailed fieldwork on the corridor; the corridor has been traversed and precise works items and locations have been identified. The estimated detailed cost of this element of rail trail development project is \$6,528,146 (excluding GST).

In the cost estimates (for both elements), an estimate has been made for the removal of the steel track and sleepers. It is a major cost (at \$33/metre). The ownership of the track and responsibility for removal (and any sale proceeds) is yet to be resolved and is part of the Tumbarumba-Rosewood Rail Trail pilot project currently underway. If the removal of track and sleepers can be a cost-neutral exercise, this will significantly reduce the trail costs.

There are unknowns when dealing with the construction of rail trails such as this. The extent of approvals needed prior to development of the trail and the requirement for permits and additional studies is not known but an allowance has been made.

TRAIL MAINTENANCE COSTS

In considering this project previously, Armidale Regional Council in particular has been concerned about ongoing maintenance costs. It is difficult estimating the costs involved in maintaining a trail until every last bridge and other infrastructure items have been installed.



This cutting through rock is one of many matters that could be interpreted along the proposed rail trail between Black Mountain and Ben Lomond. It is a magnificent achievement that should be recognised.

The use of volunteers to undertake many of the routine repairs and cleaning tasks can substantially reduce the costs.

An estimate of annual maintenance costs for maintain the New England Rail Trail from Ben Lomond to Black Mountain is \$96,000/year. This equates to approximately \$2,820 per kilometre per year. On the basis of extrapolation (rather than any detailed fieldwork), the annual maintenance costs for the Armidale to Black Mountain section is \$103,290/year and for the Ben Lomond to Glen Innes section is \$109,500/year.

RECOMMENDATIONS

It is recommended that the Armidale Regional Council and the Glen Innes Severn Council:

- ✚ Use this Trail Plan, and other documentation (including letters of support from the community), in future funding applications to the NSW Government.
- ✚ Use this Trail Plan as supporting documentation as it goes through the processes set out by the NSW Government for the legal closure of railway corridors.
- ✚ Undertake the preparation of detailed trail development plans for extending the rail trail from Armidale to Black Mountain, and from Ben Lomond to Glen Innes as part of the process of proceeding with this project.
- ✚ Should the trail proceed, take measures to ensure that the removal of rail and any necessary demolition is done with utmost care to ensure that the corridor and railway formation is left in a good condition for trail construction. The trail construction task (and associated costs) may be significantly impacted if the formation is damaged during rail removal.



Although rail trails have shallow gradients, they can and usually do provide sweeping vistas out over the surrounding landscape as shown in this scene between Ben Lomond and Llangothlin.

SECTION 1 – BACKGROUND

The NSW Railway was the first government-owned railway in the British Empire – the Sydney Railway Company was formed in 1848. The first line in NSW was a 22 kilometre line opened in September 1855. From this initial network, NSW now has over 11,000 kilometres of rail network.

The corridor which is the focus of the study (Armidale to Glen Innes) was originally part of the Main North Line which started in Sydney and extended north to the Queensland border, at the town of Wallangarra (and continued in Queensland to Brisbane). It once was the main line to Queensland, with a break-of-gauge at the border. The Main North Line was opened in stages during the railway construction booms in the latter half of the 1800s. The line from Uralla to Armidale opened in February 1883. In August 1884, it was extended to Glen Innes (two sections were opened simultaneously – Armidale to Dumaresq and Dumaresq to Glen Innes). In September 1886, the line was extended to Tenterfield.

As road transport became steadily more efficient during the 1950s, the railways began to lose their primary function. Throughout the following decades, scores were abandoned. Many of these corridors remain in public ownership. In NSW, railway lines cannot be closed without a specific Act of Parliament; consequently, many rail lines are classified as disused. The condition of these railway reserves varies widely, but many are still intact as 'linear corridors' in public ownership.



Above left: Some of the old bridges will require repairs, or replacement, for trail use. Above right: significant deterioration has occurred to the railway line since trains last ran some 30 years ago.

The Main North Line was closed north of Glen Innes in October 1989, while October 1993 saw the closure of the line north of Dumaresq. The last regular services to operate north of Armidale was the *Northern Mail* which ceased in November 1988. Freight services continued to serve a fertilizer depot at Dumaresq until the mid-2000s, after which the line closed north of Armidale. In July 1992, the line to Glen Innes was used as a crew training service.

[https://en.wikipedia.org/wiki/Main_North_railway_line,_New_South_Wales;](https://en.wikipedia.org/wiki/Main_North_railway_line,_New_South_Wales)

[https://www.nswrail.net/infrastructure/timeline.php;](https://www.nswrail.net/infrastructure/timeline.php)

[https://www.nswrail.net/lines/show.php?name=NSW:main_north\).](https://www.nswrail.net/lines/show.php?name=NSW:main_north)

The corridor between Armidale and Glen Innes remains in public ownership.

Some important reminders of the former railway remain along the corridor both within the Black Mountain to Ben Lomond section (the primary focus of this study) and the sections

immediately north and south of this section i.e. Armidale to Black Mountain, and Ben Lomond to Glen Innes. The railway stations along the entire section of corridor are amongst the most intact stations in NSW on disused railway lines. Many of the stations still have associated infrastructure (such as goods sheds and various signalling mechanisms) intact and in many cases restored. Cuttings and embankments are a common feature along the corridor.

Since the closure of the operating railway over 30 years ago, little maintenance has been carried on within the railway reserve – with the notable exception of the station grounds. In most locations, the steel railway track and old rotting sleepers remain. Some lengths of the steel railway track have been removed.



The railway stations along this entire section of corridor are amongst the most intact stations on disused railway lines in NSW. Many of the stations still have associated infrastructure (such as goods sheds, switches and signalling equipment) intact and in some cases restored.

This report provides the Councils with a construction blueprint for the section of a rail trail on the rail corridor between Black Mountain and Ben Lomond, enabling it to proceed with the establishment of the rail trail (should it determine this to be the appropriate course of action) once funds become available and legislative impediments are removed. It also sets out to examine the possibilities of a rail trail on the sections immediately south and north of the section subject to detailed study i.e. Armidale to Black Mountain, and Ben Lomond to Glen Innes.

Rail trails in NSW are being progressed through the development of a pilot project – a rail trail from Tumbarumba to Rosewood (southern NSW). It is understood that the Northern Rivers Rail Trail is also the subject of this pilot program. There have been many announcements by the Government about the possibility of a third pilot project but no firm details have emerged as to which project (if any) will be considered as a third pilot (there are a number of rail trail proposals across NSW – some have done detailed studies such as this one while others have done very little work). The NSW Government is using the pilot project to answer a number of questions including enabling legislation and “project success”. It is understood that there will be no progress on other rail trails until the pilot project has been assessed. Once these projects have been assessed, the Government may determine to fund the construction of other rail trail projects.



This interesting and historic road bridge over the railway just south of Glen Innes is another feature that will make the proposed rail trail an attractive recreation opportunity for local people and visitors to the region.

SECTION 2 – THE SCOPE OF WORKS FOR THIS PROJECT

The aims of this project are twofold:

1. To provide commentary on, and a strategic assessment of, the potential for a rail trail on the disused rail corridor between Armidale and Glen Innes.
2. To prepare a detailed trail development plan for the proposed rail trail along the disused rail corridor between Black Mountain and Ben Lomond (a distance of approximately 34 km).

2.1 STRATEGIC ASSESSMENT

The Strategic Assessment will evaluate (in brief) the overall costs and benefits of developing a rail trail along the corridor from Armidale to Glen Innes. It will cover:

- ✓ Identification of regional social, economic and environmental benefits and opportunities of community involvement. Estimation of the potential monetary value of each of these benefits to the local and regional economy will be provided based on a combination of likely visitor numbers and expenditure profiles;
- ✓ Identification of the potential business opportunities arising from the establishment of the rail trail (at a broad level);
- ✓ Evaluation of potential demand and sources of demand;
- ✓ Identification of likely indicative costs of construction and maintenance for the rail trail. The section from Black Mountain to Ben Lomond will be subject to the development of a more rigorous analysis of likely costs (both construction and maintenance) as it will be the focus of the trail development plan. The client can use these detailed costings (provided on a unit basis) to extrapolate the likely costs for development and maintenance for a longer rail trail (Armidale to Glen Innes); and
- ✓ Implementation schedule for the rail trail and recommendations on the next steps.

This allows the Councils (Armidale and Glen Innes Severn) to be armed with relevant answers during any community discussions on the proposal.

2.2 TRAIL DEVELOPMENT PLAN

The trail development plan will provide sufficient detail for a funding application to be prepared and to guide the actual construction once funding has been obtained. It will focus on the section of the rail corridor from Black Mountain to Ben Lomond. The trail development plan will be a construction blueprint. The primary focus will be on the works necessary to convert the corridor to a rail trail and the ongoing maintenance and funding. The trail development plan will build on the groundwork already prepared by New England Rail Trail Inc. in various submissions and reports.

The study brief does not include any formal community consultation in this project. The NSW Department of Premier and Cabinet has hosted two community forums on this project – more specifically on a broader project encompassing the future use of the rail corridor from Armidale to Wallangarra.

SECTION 3 – ISSUES AND OPPORTUNITIES

As stated in Section 2, the aims of this project are two-fold:

1. To provide commentary on, and a strategic assessment of, the potential for a rail trail on the disused rail corridor between Armidale and Glen Innes (102km).
2. To prepare a detailed trail development plan for the proposed rail trail along the disused rail corridor between Black Mountain and Ben Lomond (a distance of approximately 34 km).

This section provides a strategic assessment of the overall corridor (Armidale to Glen Innes) focussing on issues and opportunities.

3.1 ISSUES

There will be a range of issues raised by adjoining landholders. Many of these were raised in the consultation conducted by the Department of Premier and Cabinet. Many of these issues and solutions have been covered by the endorsed NSW Government position as laid out in the *Strategic Risk Assessment – Biosecurity Risks Associated with Rail Trails*.

Consequently, this report does not provide commentary and solutions on these issues as they are of a general nature and have been extensively canvassed in both the community forums and the Strategic Risk Assessment paper. There are some specific issues that are relevant only to this corridor that impact upon its development (other issues such as clearing and drainage are also generally dealt with in Section 5 on trail design).

3.1.1 CORRIDORS IN FARMING AREAS

The corridor under scrutiny passes through a range of rural landscapes. The section of the corridor that has been subject of detailed study (Ben Lomond to Black Mountain) is generally surrounded by constructed roads, either on one side or both sides. This reduces the potential for adjoining landholder management issues (though there will be some issues and these have been anticipated in the works lists contained in Section 6). This also means that access to the corridor for construction is relatively easy and thus comparatively inexpensive. The “remote” nature of the corridor along the other two sections (Armidale to Black Mountain, and Ben Lomond to Glen Innes) means that it passes through a higher proportion of land that is actively farmed with landholders on both sides of the corridor presenting a range of issues around farm management and construction access.

Adjacent landowners are traditionally – and understandably – apprehensive about trails close to their properties. It is important that these concerns are seriously addressed before any trail conversion takes place. Many landowners resent having things imposed on them or feeling as if they have no say in what is happening around them. Many landowners are resistant to change of any sort, let alone one they perceive will have detrimental impacts on their lifestyle as well as on their farming operations. It needs to be appreciated that opposition will never completely cease – some people will never be convinced, despite a plethora of testimonials from people in very similar situations.

Conversely, adjacent landowners who understand and support the reasons behind a trail, and who see that the trail is going to be well organised and efficiently managed, will prove

to be extremely valuable partners in years to come. Indeed, some of them will take advantage of business opportunities offered by the rail trail project.

The general issues usually raised by landholders are dealt with in the *Strategic Risk Assessment* document. The trail design section of this report (Section 5) outlines a range of solutions to address farm management issues. It is not known how many of these issues will arise and where they will arise along the two sections of corridor – determining these would be addressed in a detailed trail development plan. The works tables in Section 6 have made a provision (in a broad estimate of costs) for addressing landholder requests.

The works tables have also added a “construction cost premium” (5% of construction costs) in recognition of the fact that construction will take a longer time period (in these two sections of the corridor) given the limited opportunities for construction vehicles and labour to access the corridor.

3.1.2 RIVERS AND CREEK CROSSINGS

Bridges are one of the most obvious reminders of the heritage value of disused railways, one of the most significant attractions of trails along disused railways and also one of the costliest items in the development of trails on former railways. Design solutions are discussed in detail in Sections 5 and 6.

The corridor between Ben Lomond and Glen Innes has 16 timber bridges ranging from very short (in the order of 5 metres) to quite substantial (including the 120 metre bridge over Beardy Waters). Re-use of these bridges will be a significant undertaking. Bridges and their re-use or replacement is not a significant issue along the corridor from Armidale to Ben Lomond.



As with most railways, the corridor between Armidale and Glen Innes contains a number of old timber bridges. They will need to be re-furbished with users in mind, as well as for emergency and maintenance vehicles.

The cost of re-decking and any other necessary structural repairs to existing bridges needs to be offset against the cost of building viable alternatives. Alternatives include reinstating a bridge at the same level or constructing a new bridge, a boardwalk or a concrete floodway lower down in the watercourse. Lower level crossings will need to be built at a height that

ensures that the crossing is not underwater at regular flow levels. Bypasses are often suggested as a viable alternative to bridges. In other trail projects, concrete ramps and floodways have been utilised but these are not very attractive, detracting from the user's experience and often come with significant maintenance issues. Not using the bridges means the loss of an essential part of the rail trail experience. If the trail proceeds, there is a strong case for retention of bridges for their heritage and convenience/utility value. Riding down a steep path to cross a creek then up an equally steep climb on the other side presents at least some trail users with daunting technical and physical challenges and necessitates careful design, construction and maintenance of gully/watercourse approaches to provide for safety and prevent erosion. Retention of the bridges also retains the positive experience of riding along the top of old bridges with panoramic views of the surrounding landscape. The rail bridges were originally built in their locations primarily because railways need very gentle grades or slopes and the same principle applies to re-use of railways as recreation trails. Bridges also provide a safe crossing when water is flowing in gullies, creeks and rivers.

The bridges are likely to have some prospect of re-use but will require a detailed examination to confirm their true condition. Engineering certification of all bridge supporting structures and abutments is strongly recommended, to ensure their structural soundness. Conditions which affect the stability of bridges during flooding include, but not limited to, the likelihood of underwater scouring around the piers, the amount and speed of water in the waterway and upstream debris that collects against the spans/piers. An engineering test will provide an assessment of past damage.

Unless there is an obvious reason for not doing so, all bridges should be retained on the assumption that they are potentially structurally sound pending a structural engineering assessment to confirm their capability to carry the weight of trail users.

3.1.3 ONGOING LEGISLATIVE ISSUES

There remain key legislative obstacles to the development of rail trails in NSW. In other states of Australia, the process of conversion is relatively simple.

In Victoria, a rail reserve is gazetted under the Crown Land (Reserves) Act as a public recreation reserve. Gazettal allows for the setting up of a formal Committee of Management, which has vested management responsibilities for the corridor.

In South Australia trail management is governed by a partnership between the Office of Recreation, Sport and Racing (an agency of the SA Government) and a community organisation and/or a Council. Land on the rail corridors is granted to the Office of Recreation and Sport by other agencies (notably the Department of Planning, Transport and Infrastructure) to facilitate rail trail development.

In Queensland, former rail corridors are designated as 'non-motorised transport corridors'.

There is currently no clear legislative or administrative process to follow in NSW. There have been ongoing discussions within the State Government about the legislative and administrative process to facilitate the conversion of disused rail corridors to recreation trails. These discussions were initiated over ten years ago as a result of the proposed Riverina Highlands Rail Trails (Wagga Wagga to Tumbarumba and Batlow to Tumut). The

NSW Government has committed \$5 million funding to the proposed Tumbarumba Rosewood Rail Trail (part of the Wagga Wagga to Tumbarumba line) as a 'pilot' project – part of the pilot project will address the legislative barriers. There also appears to be elements of a pilot project in the development of the Northern Rivers Rail Trail.

This funding was made available through the Regional Tourism Infrastructure Fund (a component of which was specifically set aside for rail trails). This has stimulated interest in the development of rail trails throughout NSW and is a clear indication that the Government is committed to resolving these legislative impediments.

3.1.4 PILOT PROJECT ASSESSMENT

As noted above, the NSW Government is proceeding with pilot rail trail projects on two corridors. It is not clear what criteria the Government will use to determine the success of the projects. There has been some discussion amongst the proponents of this project as to whether, and how, this project may qualify as a pilot project. If it is used as a pilot project, there needs to be some caution exercised around visitor numbers who may be attracted. A shorter trail (Black Mountain to Ben Lomond) has the potential to attract a number level of usage. However, the longer trail (Armidale to Glen Innes) has the potential to attract a much larger number of users (for a range of reasons). This is further explored in Section 4. Assessing the success of the pilot project will very much depend upon whether and how visitor numbers are assessed and whether the corridor subject to the pilot project is the shorter or longer corridor.

3.1.5 REINSTATING TRAIN SERVICES ON THE RAIL CORRIDOR

There are some members of the broader New England community who have expressed a desire to see passenger train services reinstated on the railway corridor north of Armidale and who consequently oppose the rail trail project, fearing the opportunity to reinstate rail services will be lost if the rail trail proceeds. In the USA, where rail trails were first developed in the 1960s, this rationale was often advanced by communities who had lost their train services and were faced with the development of a rail trail as an alternative corridor use. There are currently 2,087 open rail-trails (in America) covering over 37,000 kilometres. It is understood that there has not been a case where the railway service has been reinstated on any of these rail trails.

The NSW Government has clearly indicated that the railway corridor will remain in public ownership should it be needed for another community purpose in the future. Reinstatement of a railway line will remain possible as the land will stay as public land. Given that a railway service has not been in operation for over 30 years, it is hard to envisage circumstances under which it would return. The Armidale Regional Council commissioned a study looking at the feasibility of a passenger service on the line. The report considered the likely costs of refurbishment of the line to modern standards and likely revenues from services. It is understood that it found that the costs significantly outweighed the likely revenue. In addition, the NSW Government has indicated it has funding available for viable rail service proposals. It is understood that the Government has yet to receive an economically viable proposal.

3.2 OPPORTUNITIES

There are a number of specific elements within the area encompassed by the proposed trail route that provide opportunities and reasons for why a trail should be built.

3.2.1 APPEALING LANDSCAPES AND INFRASTRUCTURE

The New England Rail Trail would pass through some very attractive scenery. Much of the proposed trail from Armidale to Glen Innes will pass through farming country, as this was where rail lines historically were routed. Views of gently undulating countryside, containing water bodies and trees are the most attractive and relaxing for many people (*St Leger 2004*). There are interesting and varied landscapes on the section between Armidale and Black Mountain, particularly north of where the trail goes underneath Booralong Rd. The landscape between Ben Lomond and Glencoe in particular (also between Glencoe and Glen Innes) is very attractive and quite spectacular. There are great panoramic views afforded in sections, often due to very high and stunning embankments. While the landscapes between Black Mountain and Ben Lomond are perhaps a little less attractive, they do provide wonderful rural vistas with sweeping views of skyline. The attractiveness of these quintessential rural landscapes to city dwellers in particular should not be underestimated.

The quality of intact railway heritage items such as switches, signals and mile pegs is very high (both of the restored and the unrestored infrastructure). The quality of the railway stations is outstanding and is possibly represents the highest quality of restored and maintained railway stations along any substantial stretch of disused railway corridor in NSW. These stations also provide a very good opportunity for the development within them of trail-related businesses – cafes, bike hire etc.



Trail users will appreciate the retention of all former railway artefacts and special care should be taken during construction to retain and, where necessary, restore or refurbish as much as possible.

3.2.2 TOPOGRAPHY OF THE PREFERRED ROUTE

One of the major appeals of rail trails is the gentle gradient, suitable for all types of cyclists, and walkers (gradient is typically less of an issue for horse riders). This is the market that would be attracted to a rail trail. Their demands are paramount in considering trail feasibility.

3.2.3 GLEN INNES CORRIDOR

It is worth noting that the rail corridor immediately south of Glen Innes Railway Station provides a “best of” a rail trail within a very short length. Within the first 5 kilometres heading south of Glen Innes station, users can see a high-quality station, historic railway infrastructure (signals, switches, etc), cuttings, embankments, timber bridges and a brick underpass – all features which clearly distinguish a rail trail from other sorts of recreational trails. This is a relatively unusual high concentration of key rail trail features.

3.2.4 CONNECTIONS BETWEEN TOWNS

Taking trail users through towns will provide new business opportunities for service providers. Presently, there are a relatively limited number of services that would appeal to trail users in many of the smaller settlements between Armidale and Glen Innes.

Development of the rail trail may provide a range of new business opportunities (or allow existing businesses to expand). Such opportunities are examined later in this section.

The trail will make an actual connection between the towns en route (whether it is a shorter rail trail or the longer rail trail) – one that reinforces historic connections.

The distances between towns is also important when considering likely users. The good one-way trails often provide opportunities for short, medium and long length rides and walks on the main trail. Towns and villages along this corridor are well located, particularly in terms of bike riding, while the whole length (102km) provides for a very attractive 2 - 3 day ride.

Connecting the towns and villages via a trail will also provide an opportunity for local residents to choose a non-motorised connection for visiting friends or undertaking some exercise. A non-motorised trail provides another psychological link between the towns on the route.

Within Armidale, extending the rail trail provides some commuting opportunities connecting the railway station (and on into town) with parts of the University including sporting ovals (which are adjacent to the rail corridor) and rural residential areas on the outskirts of town. Connecting paths to the rail trail would need to be planned and constructed – this would be the subject of detailed trail development planning. The *Community Strategic Plan 2017-2027* for Armidale Regional Council included a community outcome about accessible transport for local connectivity. One of the supporting strategies to deliver this outcome was to promote cycling for transport as a healthy, environmentally friendly option – a rail trail provides the perfect environment for many riders.

In Glen Innes, it has been indicated that the Council is looking at providing cycling links from the vicinity of the railway station to the centre of town as part of its cycle planning.

3.2.5 A TRAIL WITH ANCHORS AT EACH END

One-way trails (or out-and-back trails) need an anchor at both ends to be attractive to users. The best one-way trails (including many rail trails) have natural terminuses in major centres or towns or pass through major towns. This is particularly an attraction for the longer corridor (Armidale to Glen Innes) with easy access to Armidale in particular (by car, train and plane). While neither Black Mountain nor Ben Lomond are major towns, the attraction of towns at either end is an incentive for trail users. Trail development may spur development of new businesses in these towns.



The development of the rail trail may provide an incentive to re-open the Ben Lomond General Store (above left) and the Glen Innes station restaurant (above right) with benefits both to rail trail users and residents of the towns.

3.2.6 BROADENING THE RECREATION OFFERINGS

Provision of an additional off-road trail adds to the list of tourist offerings in the New England region and encourages visitors to stay a little longer to go for a pleasant walk or ride. A new nature-based attraction has the power to retain those visitors for longer, spending money and generating business opportunities. Natural assets that are utilised for outdoor recreation are found in the region; adding a rail trail to that list will encourage more visitors looking for that type of experience.

Provision of a rail trail within the region will increase the attractiveness of the region for those people who like outdoor recreation combined with food opportunities. The region provides a rural experience supported by a calendar of events and festivals. A rail trail would add to this range of attractions for a number of markets.

It is worth noting that many rail trail users come from the (generally) higher paying professional and managerial occupations; combined with the typical age profile (discussed below), food and wine consumption form a major motivator for those using rail trails and many rail trails (in South Australia and Victoria) have built upon this desire by users.

It is noted that Armidale already has a relatively strong cycling culture (both urban and touring). Glen Innes Severn Council has expressed an interest in developing a better cycle

network within Glen Innes. A rail trail would add significantly to both these existing opportunities and cultures.

A rail trail will also provide opportunities for local residents, many of whom will use the rail trail frequently (this is further discussed in Section 4). Consultation for preparation of the *Armidale Community Strategic Plan 2017-2027* identified that there is a demand for activities for children and young people including improved recreational facilities. Bike tracks were one of the infrastructure items commonly identified as needed.



Building a rail trail along the disused railway corridor will stimulate economic activity and be of benefit to the local communities in several ways.

3.2.7 DELIVERING ON AGREED COMMUNITY OUTCOMES

The NSW Government, Armidale Regional Council and Glen Innes Severn Council have prepared a number of community, planning and economic documents in recent times outlining a range of goals, objectives and actions. Developing a rail trail on the corridor delivers on a number of these goals, objectives and actions. In the case of Glen Innes Severn Council, delivering on these actions will result from development of the rail trail from Ben Lomond to Glen Innes. The NSW Government has also prepared the *New England North West Regional Plan 2036*; a rail trail will deliver on a number of the goals and actions from this plan. How a rail trail aligns with these broad outcomes is best shown under each broad goal (which are similar in a range of documents).

3.2.7.1 Economic Development

Rail trails provide an additional tourism asset to the communities through which they pass. This in turn creates a number of economic opportunities both for existing businesses and new businesses. This is further explored in Section 3.6. Various planning and community documents prepared for the two Councils and the wider region include goals and actions around supporting and diversifying the existing economic base.

The NSW Government's *A 20-year Economic Vision for Regional NSW (July 2018)* identifies that tourism and hospitality is one of the industries driving the economic future of Regional NSW. It identifies that, in the future, Regional NSW's diverse and natural beauty will

continue to draw domestic and overseas visitors, with opportunities growing for niche and personalised travel experiences championed by small and medium- sized businesses. It states that sustainable jobs growth will be supported by regions' endowments, created or natural. A rail trail is one asset which can provide more employment opportunities in tourism and hospitality by offering niche tourism experiences.

The *Northern New England Economic Development Strategy 2018-2022* (covering Glen Innes Severn Shire) identifies that tourism is emerging (in its region) as an important industry that brings money into the region. It also provides employment opportunities - Accommodation and Food Services (which is a proxy for tourism) is the fourth largest employer in the Region. It is also independent of agricultural industries, helps raise the profile of the Region and plays a part in relocation decisions. The Strategy identifies that there are opportunities to continue to grow the short breaks and day visitor markets out of the South East Queensland and the Northern Rivers Region of NSW, special interest and activity-based markets and the long-haul touring market. One of the economic development tools is to support and grow the tourism sector (visitor economy) through product development, improved signage, marketing promotion, and growing the events sector. The Strategy identifies additional key infrastructure investment priorities including product development by improving existing attractions and facilities and developing new attractions. A rail trail would be one such infrastructure project that would help achieve the outcomes sought.

The *Community Strategic Plan 2017-2027* for Armidale Regional Council identifies that there is a strong community sentiment that more needs to be done to attract new businesses and industries, in order to create a sustainable economy and employment opportunities in the region. Within the community, tourism is seen as a key way of boosting the vibrancy, attractiveness and economic sustainability of the Armidale town centre and also the other towns across the region. Across a number of themes and outcomes in the Plan, there was a common desire to expand the opportunities for businesses, encouraging and attracting new businesses and providing employment opportunities. The rail trail was identified as a piece of infrastructure by which innovation and growth could be encouraged. One of the key community outcomes was that the visitor economy generates additional revenue and employment to boost the local economy and creates opportunities for more vibrant cultural offerings and activities. A tool for doing this was the preparation of a tourism strategy that encourages visitors to stay longer and also enhances the economic and cultural offerings and attractions of the region. A rail trail can deliver on these outcomes (this is further discussed in Section 3.6).

The *Economic Development Strategy 2017-2025* for Armidale Regional Council has a key objective of supporting existing businesses, attracting new industries and businesses and creating more employment opportunities. The Strategy indicates a desired outcome to establish the Armidale Region as a premium regional destination for tourism and events. In doing this, it recognises that visitors generate valuable export dollars for the Armidale Region that create jobs across a diversity of industries. Visitor activity impacts on food and entertainment, retail, arts and culture, creative industries, transport and logistics, sporting and recreation facilities and events, and the Armidale Region's accommodation sector.

The *Community Strategic Plan for Glen Innes Severn Council* recognises that economic development and attracting new investment is one area of endeavour where the Council should make a greater effort. Attracting new business and investment (46%) was the top mentioned priority for Council to focus on into the future; and where the community would

like to see resources directed. The Strategic Plan notes that the visitor economy is a significant economic contributor for Glen Innes with a number of local tourist attractions and events. A key goal articulated in the Plan is to facilitate market and business opportunities and strengthen accessibility and provide incentives to draw visitors into the Glen Innes Highlands.

3.2.7.2 Attractive Communities

Quality recreational facilities, such as trail networks, can help create attractive places to live and visit. Walking and cycling are relatively cheap modes of transport. Trails also provide a low impact means of travelling through the landscapes and play an important role in connecting people with nature. Various planning and community documents prepared for the two Councils and the wider region include goals and actions around improving the attractiveness of local communities as places to live.

The *Northern New England Economic Development Strategy* sums up this very clearly. The document states that “attracting new businesses and residents to the Northern New England High Country Region (or any region) is dependent in part on the ‘attractiveness’ and ‘liveability’ of the area, with the Region competing with other localities throughout Australia.”



Assuming a trail can be developed through the Guyra station ground, there will be benefits to the community as the trail will add to the range of activities available to local people and visitors to Guyra.

The NSW Government’s *A 20-year Economic Vision for Regional NSW* expresses an approach which envisages more employment opportunities in regional NSW, which in turn retains and attracts younger generations and creates sustainable, thriving regional cities and towns. A rail trail is one asset which can provide both more employment opportunities in and create attractive cities and towns.

The *Northern New England Economic Development Strategy 2018-2022* identifies that there is potential for the Region to attract tree changers, people who can telecommute, semi-retirees and active retirees; boutique / specialist agricultural producers, artisans and manufacturers; and the ‘creative’ professions such as architects and designers. The Strategy

identifies that ensuring that the Region is an attractive place to live, work, invest and visit, and has the right facilities and services is part of the foundation for growth of the active-retiree sector.

The *New England North West Regional Plan* includes within its vision for the region communities that are attractive, healthy, safe and prosperous, with a strong sense of community identity. The vision states further that people are able access a range of employment opportunities, vibrant events and festivals and high-quality recreational services. A rail trail can deliver on many of these elements. The Plan also highlights the importance of attractive lifestyles in driving population growth, a desired outcome of the Plan.

The *Community Strategic Plan 2017-2027* for Armidale Regional Council includes an outcome to ensure that the community experiences the benefits of an increasing population. A number of supporting strategies to achieve this outcome are about promoting the region as a destination for new residents and workers, and actively seeking out and encouraging businesses and organisations to locate their operations in the region.

The *Economic Development Strategy 2017-2025* for Armidale Regional Council includes the strategic objective of establishing the Armidale Region as a location of choice for 'knowledge workers', entrepreneurs and major innovative businesses seeking a sophisticated, family-friendly city-region lifestyle. The Strategy notes that knowledge workers - people who are paid to solve problems and generate wealth through the creation of new ideas - are the new drivers of regional economic prosperity. Attracting and retaining knowledge workers and knowledge-intensive businesses is key to the Armidale Region's capacity to prosper in the new economy. It recognises that Armidale and Guyra have many attributes which appeal to 'knowledge workers' including quality recreational, leisure and sporting facilities. A rail trail would add to this suite of attractions.

According to the Regional Australia Institute, one of the key population shifts back to regional cities in recent years are 'regional returners'. These are people aged between 25-44 who left Australia's regions as young adults, but are choosing to return home later in life, and a number are professionals with a mix of specialist skills. Lifestyle is one factor that makes regional areas like Armidale an attractive alternative to capital cities. It is one attribute which supports Armidale's potential to enhance its appeal as a 'knowledge region' and which underpin Armidale Regional Council's approach to investment attraction. A rail trail is part of this mix of lifestyle opportunities.

The *Community Strategic Plan* for Glen Innes Severn Council looks to grow the population of the Shire over the next 10 years. Actions identified to do so include encouraging young people to return to the Shire to raise their families, work in the area, work remotely from this area or establish their own businesses and/ or industries in the area, and attracting the population segment looking for a lifestyle change (branding for tree changers). The provision of quality recreation assets and opportunities (such as a rail trail) is one way of adding to an area's appeal for both families and tree changers. The Plan also makes a specific reference to advocating for the development of a rail trail to promote pedestrian and cycle connectivity and as a way of improving opportunities for passive recreation around existing natural and heritage assets.

3.2.7.3 Healthy Communities

Rail trails are an accessible form of recreation. Trail-based recreation is generally free, self-directed and available to all people, all day, every day. Good quality, accessible trails encourage physical activity and improved health. Increasing recreational options for local communities will aid overall community wellbeing. The trail will encourage people to exercise. Participation in trail activities can improve physical and mental health, assisting with disease prevention particularly cardiovascular, musculoskeletal, respiratory, nervous and endocrine systems as well as reducing obesity, hypertension, depression and anxiety. Various planning and community documents prepared for the two Councils and the wider region include goals and actions around improving the health of local communities.

The *New England North West Regional Plan* includes a direction to support healthy, socially engaged and well-connected communities. An action from this is to facilitate more recreational walking and cycling paths, linkages with centres and public transport, and expand inter-regional and intra-regional walking and cycling links. A rail trail, particularly one which is developed along the longer corridor (Armidale to Glen Innes) is a relatively low-cost option for developing such connections (physically and psychologically).




The *Community Strategic Plan* for Glen Innes Severn Council has a goal of encouraging the community to be more active. The same document for Armidale Regional Council supports cycling as a healthy form of transport.

3.3 VISITOR MARKET AND NEEDS ANALYSIS

A trail such as the proposed New England Rail Trail will provide a number of opportunities generally associated with recreation trails. These opportunities will be provided in general whether the trail runs from Ben Lomond to Black Mountain, or from Armidale to Glen Innes. It is reasonable to argue that the magnitude of the opportunities will be different if the longer rail trail is developed. A longer rail trail may also provide additional opportunities, particularly in the visitor market.





A trail will bring additional tourists and keeping them longer in the area.

Other possible benefits from developing the trail include:

-  Improvements to community connectivity;
-  Increasing recreational options for local people; and
-  Creating opportunities to build on existing industries and enterprises of the area.

3.3.1 GENERAL VISITOR TRENDS

The draft *Armidale Regional Council Tourism Strategy 2018-2020* highlights a number of key observations about tourism generally – which are also applicable to the New England region. It states that regional destinations offer key experiences for what Australians are seeking from their holidays. While Australian travellers do not have one typical destination in mind when they think about regional travel, there are some experiences common to everybody's idea of what is on offer in regional Australia. It looks at these experiences for each of the three major markets – millennials, families and over 55s.

-  The millennials age group seeks authentic and genuine travel experiences, together with a variety of active and passive ways to enjoy them. For older millennials, in the 25-34 age group, travel is about rejuvenation and search for self. Through travel, this group seeks to recover from work and is a way of getting away from responsibilities of everyday life. They feel the need for regular breaks to sustain and keep themselves going and seek out relaxing experiences that they can't have at home. (*Tourism Research Australia, 2017*). For regional destinations to attract millennials, they need to offer something unique and have basic, yet sophisticated experiences. This could include nature-based experiences, as well as country food and wine. Short breaks in regional NSW currently offer millennials an opportunity to relax and reflect, often with friends. Importantly, in this context, rest and relaxation does not mean just passive experiences, but rather experiences that promote discovery, rejuvenation and an opportunity to forget about routine life, and these can include very active pursuits. (*Tourism Research Australia, 2017 cited in the Tourism Strategy*)
-  At the opposite end of the age range, the over 55s is one of most powerful age groups in Australia in terms of financial capability and life expectancy is increasing. In a recent survey of Australians aged over 55 years, 96% of respondents took at least one leisure trip within Australia in the past 12 months, and the percentage of respondents who took two and three leisure trips was 26% and 23% respectively. This age group preferred domestic travel to international travel. According to the survey, the most important reasons for over 55s taking overnight leisure trips are spending time with family and friends, getting away from daily routine, having fun, spending time with partner and to relax mentally. (*Destination NSW, May 2015 cited in the Tourism Strategy*).
-  Within the over 55s market (and perhaps importantly a distinct sub-set of it), the *Destination Country* and *Outback NSW's Destination Management Plan 2018-2020* identifies a global mega-trend that the fifties are the new demographic for travel brands – more people are choosing to travel earlier than retirement to enjoy the more active or immersive experiences that destinations have to offer. This is one of the key demographics for rail trails.
-  For families, domestic travel offers an opportunity to have a break from normal routine, to reconnect and open the lines of communication between adults and children without time pressures. Ease and convenience are the key drivers for domestic travel by families in Australia, and they are looking for destinations that are relaxed and easy with beautiful surroundings, preferably only a few hours' drive from home. (*Destination NSW, June 2015*). Destinations that offer relaxation, novelty, outdoor activities, arts and heritage sites are appealing to families. However, family travellers seek destinations for relaxation more than non-family travellers. Family travellers seek holidays offering experiences that are authentic, different to normal and which create positive memories. The future of family tourism lies in catering for the increasing diversity of the family market. It includes offering opportunities for relaxation as well as activities that help create happy memories that appeal to the different ages of travellers in diverse family group structures. (*Schänzel and Yeoman, 2015 cited in the Tourism Strategy*). This market (particularly the 35-54 age group) is higher yield and is continuing to show positive growth.

3.3.2 GENERAL VISITOR NUMBERS

Available figures for the North West New England Region for the last 8 years are shown in Table 1 (note that the region is a larger region than the region around the rail trail – data for the two shires follows). Visitation has fluctuated in the 8-year period.

- ✚ The number of domestic overnight visitors has increased in the last 8 years (though there was a decrease in the middle of the period). The March 2018 figure represents a 4.3 % increase over the corresponding period in 2017 and a 29.1% increase over the corresponding period in 2010.
- ✚ The number of international visitors to March 2018 (42,100) represents an 11.8% increase over the corresponding period in 2017 but a 12.1% decrease over the corresponding period in 2010. These figures have jumped around since 2010 and the 2018 date represents the second highest number in that period (the highest number was 47,800 in 2010).
- ✚ In the period ending March 2018, day trippers numbered 1.759 million. This represents a 0.8% decrease over the corresponding period in 2017 and a 4.1% decrease over the corresponding period in 2010. Again, these figures are quite volatile. The 2018 data represents the 5th highest number in that period (the highest was 2.001 million in 2011). Day trippers are almost exclusively from within the region (this is not surprising given the size of the region).



These old brick lined culverts are a feature of the corridor and should be featured on any interpretive material produced when the proposed rail trail is developed.

Table 1: Visitor numbers to the North West New England Region 2010 – 2018

Year ending	Domestic overnight visitors	Day trip visitors	International visitors
Mar 2010	1 245 000	1 833 000	47 800
Mar 2011	1 237 000	2 001 000	34 400
Mar 2012	1 355 000	1 870 000	40 800
Mar 2013	1 394 000	1 420 000	32 100
Mar 2014	1 259 000	1 571 000	33 000
Mar 2015	1 315 000	1 732 000	31 400
Mar 2016	1 344 000	1 410 000	30 600
Mar 2017	1 542 000	1 774 000	37 600
Mar 2018	1 607 000	1 759 000	42 100

Source: Destination NSW 2018

Visitor statistics for the two Local Governments (Armidale Regional and Glen Innes Severn Shire) are available across a 4-year average (2013-2016) and show:

- Armidale Regional Council attracted 268,000 domestic overnight visitors/year. Glen Innes Severn Shire attracted 97,000 domestic overnight visitors.
- Average stay for overnight visitors was 2 nights for Armidale Regional Council and 3 nights for Glen Innes Severn Shire.
- Armidale Regional Council attracted 313,000 daytrip visitors. Unfortunately, comparative figures have not been published for Glen Innes Severn Shire.
- International visitation was quite low with 9,000 international visitors coming to Armidale Regional Council. Unfortunately, comparative figures have not been published for Glen Innes Severn Shire.
- Employment statistic show 355 businesses engaged in tourism in the Armidale Region. The vast majority of these employed up to 19 people (with 70% employing up to 4 people). While Glen Innes Severn Shire has less businesses engaged in tourism (123), the employment profile is similar with 76% employing up to 4 people. (Source: TRA 2018)

The short break market (1-3 days) has been a predominant market for domestic tourism for some time and it remains a key market for visitors to the region. People on short breaks often look for a trail experience as part of their holiday.

3.3.3 TRAIL USER NUMBERS




3.3.3.1 Visitors

Recreation trails provide an important piece of tourism infrastructure and provide experiences in the nature-based tourism market and particularly the adventure tourism market. Nature-based tourism is estimated to be growing at 10-30% per annum – a significant growth market to target (*Victorian Nature-based Tourism Strategy 2008-2012*).

Visitors most likely to participate in cycling or walking activities are 'nature visitors'. According to Tourism Research Australia (TRA), the majority of nature visitors in Australia are domestic visitors rather than international visitors. Research undertaken by TRA indicates the number of nature visitors in Australia in 2009 totalled 28.31 million people; made up of 3.3 million international visitors, 12.46 domestic overnight visitors and 12.55 million domestic day visitors.

Research shows that nature-based activities are important for tourism in the region (*Destination Country and Outback NSW's Destination Management Plan 2018-2020*). The number for trips that include nature-related experiences is growing in real numbers and as a percentage of total trips.




The Destination Management Plan reports that Australians have participated in a broad range of nature-based activities as part of their overnight travel over the last year (2017). This includes:

-  An increase of 12% to 10.8 million visitors to national parks;
-  More people undertaking bushwalking, which grew by 9% to 11.3 million; and
-  Growth of 12% in water-based activities and sports, up to 3.4 million visitors.





There has also been an increase in the number of domestic overnight travellers who connect with local communities, in particular through attending festivals, events and fairs, which grew by 14% to around 3.4 million.

Not all nature visitors are interested in the types of activities undertaken on tracks and trails, however Tourism Research Australia estimates that 51% of domestic overnight nature visitors take part in bushwalking / rainforest walks, whilst 39% of domestic day visitors and 37% of international visitors enjoy this type of activity (*TRA Snapshots 2009*).

The New England Region has an existing appeal for nature-based recreation. The draft *Armidale Regional Council Tourism Strategy* identifies that strengths of the region (in terms of nature-based recreation) include:

-  Natural attractions and natural beauty were considered to the key strengths of the Armidale region;
-  Lots of opportunities for outdoor exploration, whether active adventures or scenic drives; and
-  The climate with four distinct and changing seasons offers a different experience throughout the year.

Opportunities that grew from these strengths include:

-  Taking advantage of unique natural attractions and untapped natural resources;
-  Capitalising on the message that coastal destinations are crowded and at capacity during warmer months;
-  The changing seasons experienced in the region are a contrast to coastal destinations – mild summers and romantic winters; and
-  Promoting various outdoor adventures and experiences that are available in the region.

The Strategy identifies developing and re-packaging products to support the promotion of nature and outdoors in the region – such as the Dumaresq Dam recreation development, New England Rail Trail development, and other outdoor adventure product development – as a key strategy.

At a broader level, the *Destination Country and Outback NSW's Destination Management Plan 2018-2020* identifies that Country and Outback NSW (a much larger region than the New England region but within which the region is contained) is losing market share in relation to nature tourism. While this is a growing market both domestically and internationally, with more people undertaking nature-based activities, the broader region is not achieving relative growth compared to other regions in NSW or Australia.

A number of high-profile trails in Australia and New Zealand provide examples of user numbers that can be achieved on tracks and trails (a product within nature-based tourism). Users are attracted to developed trails that are both 'known' or advertised in some way and offer a range of facilities such as signage and interpretation, parking, toilets and water. Each trail has its own reasons for success. One of the common elements is that the trail itself is the physical element (and is often managed by a Government agency) while private sector businesses and community-based organisations (such as the Bibbulmun Track Foundation) provide the 'experiences' of and around the trail.

- ✚ Use of the Bibbulmun Track (WA's long-distance walking track linking Perth and Albany) increased from 10,000 in 1998 to 35,000 in 1999-2000 to 137,500 in 2003 (*Colmar Brunton 2004*) to over 167,000 in 2008 (*Colmar Brunton 2009*). 79% of 2007/08 users came to the track specifically to use the track. The Bibbulmun Track offers a wide range of experiences, from a gentle stroll to enjoy the peace and beauty of the natural environment, to an epic eight-week adventure. The trail offers a diversity of accommodation – users can enjoy a wilderness experience by camping out, they can join a guided group, a tour, or they can do it in comfort by staying in the towns along the Track and enjoying day walks in the area (*Bibbulmun Track Foundation website*).
- ✚ The Munda Biddi Trail is WA's off-road cycle touring equivalent of the Bibbulmun Track. Running from Perth to Albany (a distance of 1,088 km), it attracts 21,000 users per year (*Munda Biddi Website*).
- ✚ The Great Ocean Walk in Victoria attracts 100,000 visitors per year (*pers com Parks Victoria*).
- ✚ The Wilsons Promontory Walk (Victoria) attracts some 60,000 visitors/year (*pers com Parks Victoria*).
- ✚ The Murray to the Mountain Rail Trail (Victoria) attracts almost 60,000 annual visitor days in 2010 (*SGS Economics and Planning 2011*).
- ✚ The Otago Central Rail Trail (NZ) offers a 3-day cycle or 5 day walk experience covering 150 kms. Over 14,000 users traverse the entire length each year, with the most popular section attracting over 20,000 users (*Central Otago District Council 2011*). Cyclists undertaking the complete journey often do so in 3 days, while walkers take 5 days (*Otago Central Rail Trail Trust 2005*). A number of tour operators offer a "guided" service for cyclists in particular, allowing users to spend all day riding

between accommodation options carrying only what they need for a day and their gear is transported from accommodation place to accommodation place.

- ✚ Data from Colac Otway Shire (Victoria) shows that the total usage on monitored sections of the Old Beechy Rail Trail for 2013 (excluding Beech Forest) was 23,368. This does not include data for the Colac section of the trail, as monitors were not installed at that location.
- ✚ In the first quarter of 2014, the Great Victorian Rail Trail (a 134 km rail trail between Tallarook and Mansfield) had 27,500 users pass through trail counters. This figure is unlikely to represent total numbers of users as some users would have travelled past more than one counter, but it does represent significant trail usage.
- ✚ Recent counts (2011-2013) for South Australia's Riesling Trail (a 34 km rail trail in the Clare Valley) show 40,000 people passing through 4 trail counters each year.

3.3.3.2 Local Users

Tourism numbers are important. However, it is important not to overlook the contribution of local residents to the success of a trail. In 2001, the Mundaring Shire (in Western Australia) trail network was used by over 200,000 people (*Jessop and Bruce 2001*), having grown from a low base when the network was first fully opened. Only 10% of these users were locals (residents of Mundaring Shire) with many other users drawn from the Perth metropolitan area. The total annual visits (people generally use trails more than once a year) were a staggering 2.454 million visits annually, with local residents accounting for 63% of these visits. Their expenditure on the trail was also significant. While the individual value was low (i.e. expenditure per person per visit), the cumulative economic impact was significant. Local trail users spent an average of \$1.44 per visit to the trails in the Shire. This injected a further \$2.23 million into the local economy annually. The same local trail users spent an additional \$2.62 per visit outside the Shire, adding a further \$4.05 million to the total State economic benefit.

Armidale Regional Council is home to an estimated population of 30,552 (<https://profile.id.com.au/armidale>), while 8,836 people call Glen Innes Severn Shire home (*2016 Census*).

3.4 TRAIL USER CHARACTERISTICS

3.4.1 BROAD TRENDS

A number of broad trends are influencing the way people participate in outdoor recreation:

- ✚ Increased demand for informal recreation (as opposed to formally organised sport);
- ✚ Increased demand for access and contact with the natural environment associated with urban to rural residential shift;
- ✚ Increased visitation to natural areas as an escape from modern lifestyles;
- ✚ Increased awareness and concern for health, with obesity and stress on the rise; ✚
- Increased use of technology to support outdoor recreation (e.g. geocaching, Strava, EveryTrail, Trailforks); and
- ✚ Increased computer-based leisure including the internet.

In general, the population are making increased 'lifestyle' choices that associate with greater access and contact with the natural environment. This includes aspects of urban to rural residential drift ('sea change' and 'tree change'), increased demand for open space (parks, recreation trails etc.) in urban developments, and increasing demands for recreational time in the outdoors (changing work patterns and day trips from home).

Two other trends have also driven higher outdoor recreation participation - increasing health and environmental awareness and increasing affluence and expectations of recreation.




People are becoming increasingly concerned about their health, with conditions such as obesity and stress on the rise. This, combined with society's growing environmental awareness, has facilitated a growth in visitation to natural areas. A term referred to as 'returning to nature', where people feel the desire to become reconnected to their natural environments from which they can escape their modern lifestyles.

As individuals become more affluent, the proportion of income spent on goods and leisure increases. As people spend more money on outdoor recreation and associated equipment, an increase in outdoor recreation activities, previously offered by commercial operators, has been observed. As such, a diversification for natural areas offering unique experiences and higher levels of infrastructure are often in demand.

3.4.2 WHAT DO PEOPLE DO ON A TRAIL?

3.4.2.1 An Overall View

Unfortunately, the most recent Exercise, Recreation and Sport Survey was done in 2010 and has not been updated since that time (though Queensland undertook its own research in 2016). The 2010 study reports on the propensity of Australians to participate in trail-related activities at a general level (note that these figures show the number of people who have participated in the activity at least once in the last year):

-  35.9% of survey respondents across Australia participated in walking, making it the most popular form of activity. This percentage has been consistent since 2001, and walking has been the most popular exercise activity since 2001 (increasing by 44% in that time). NSW figures for 2010 are consistent with this national average, with 34% of survey respondents across NSW participating in walking.
-  11.9% of survey respondents across Australia participated in cycling, making it the fourth most popular form of activity. Again, cycling has been amongst the top 5 activities since the ERASS began in 2001 and has increased by 45% between 2001 and 2010. The 2010 level is the highest in 10 years. NSW figures for 2010 are consistent with this national average, with 10.6% of survey respondents across NSW participating in cycling.
-  4.8% of survey respondents across Australia participated in bushwalking, making it the seventh most popular form of activity. Bushwalking's percentage share of exercise has moved up and down since 2001, but it consistently appears in the Top 10 activities. NSW figures for 2010 are consistent with this national average, with 4.8% of survey respondents across NSW participating in bushwalking.

- ✚ An estimated 6.7 million persons aged 15 years and over participated at least three times per week in non-organised physical activity (which includes walking, cycling and bushwalking), a regular participation rate of 38.5%.

A number of survey-based studies are available which together give a consistent indication of participation levels relevant to trails-related outdoor recreation activities. These studies come from South East Queensland (1998, 2001 and 2007), South Australia (Adelaide and Adelaide Hills, and *Market Equity 2004*), and the ACT. Table 2 provides a summary of the relevant participation rates.

Table 2: Participation Rates in Outdoor Recreation Activities

Study	Walking	Cycling	Horse riding
SE Qld (1998)	60%	25%	7%
SE Qld (2001)	50%	26%	7%
SE Qld (2007)	35%	29%	7%
South Australia	59%	26%	*
SA – Market Equity	69%	29%	*
ACT	73%	58%	*

* no horse riding trails were considered in these surveys

The figures for participation show the percentage of the population for the town or region who had participated at least once in walking, cycling or horse riding in the previous 12 months. All studies used large samples. (A number of other outdoor-related activities such as bird watching, canoeing and scuba diving were included as possible responses – this is why the figures do not add up to 100%). The ACT study included a large number of school-aged children, which may explain the higher participation rates, particularly for cycling. The very extensive Canberra bike path network may also have contributed to the high participation in cycling. The point of most significance in these figures is the relative proportion or level of participation for each of the three activities.

3.4.2.2 Walking

Clearly walking is the most popular trail related activity and is in fact one of the most popular outdoor activities amongst all Australians. It is likely to remain so as the population ages. Walking continues to be the most popular activity for people aged over 34 (*ERASS 2010*). Bushwalking continues to be a relatively popular activity.



3.4.2.3 Off-Road Cycling

Unfortunately, none of the surveys distinguish between cycling generally and off-road cycling (both off-road cycle touring and traditional mountain biking). Off-road cycle touring and mountain biking is a rapidly growing recreational pursuit around Australia, and there is growing usage of non-urban areas for this activity. Cycle tourism is a growing market within the Australian tourism sector, particularly within the nature-based tourism segment. Available research demonstrates that cycle tourism has the potential to make an active contribution towards the economic revitalisation of regional Australia as well as improve quality of life for its residents (*Victoria's Cycle Tourism Action Plan 2011-2015*). Cycle tourism is a growing market. NSW received 520,000 cycling visitors in 2007 who stayed an

average of 5.1 nights (*New Zealand Cycleway Market Research 2009*). In 2010, Australia recorded approximately 258,000 international overnight visitors who participated in cycling (*Victoria's Cycle Tourism Action Plan 2011-2015*). Domestic overnight visitors who participate in cycling on their trip stay longer and do more while on holiday when compared with other tourists, making them a stronger source of income for regional communities.

Mountain biking underwent a tremendous increase through the 1990's. It has been one of the 'boom' recreational pastimes of the last two decades. Cross-country mountain biking (the oldest type of mountain biking) remains the most popular type of mountain biking activity. It can be undertaken in a variety of places and terrains, from management trails to shared trails to purpose-built single track.

In February 2016, the NSW Office of Environment and Heritage released the Kosciuszko National Park Cycling Strategy for consultation. The Strategy identified that mountain bike riders can be broadly divided into core and non-core riders:

-  Core mountain bikers tend to be more experienced riders who may differentiate into one or more different genres. They tend to have high levels of mountain bike participation, are high spenders on gear and equipment, are willing to travel to mountain biking destinations and have a high likelihood of participating in competitive events.
-  Non-core mountain bikers include novices, families seeking safe enjoyable places to ride away from cars, school groups (often guided by tour operators), off-road bike tourers (from rail trails to trails in steeper and more difficult terrain) and people seeking a different outdoor experience or adventure (such as undertaking a guided experience or hiring a bike while on holiday).

Cyclists are the most dominant user group on the Tasmanian Trail. The Mawson Trail in South Australia was primarily designed for off-road cycle touring, and the 1,000km Munda Biddi Trail in WA is designed exclusively for off-road cycle touring. These projects indicate a growing demand for cycle trails, as does the popularity of rail trails in Victoria. Over the last five years, much of the trail planning and building activity across Australia has focussed on mountain bike trails, either within reserves or in specifically prepared mountain bike parks (such as the Forrest Mountain Bike Trails in Victoria's Otway Region). The SEQ Regional Trails Strategy (*Qld Outdoor Recreation Federation 2007*) also noted a strong demand for cycling in younger age groups (less than 30 years old). Work by Market Equity (2004) for the South Australian Office of Recreation and Sport adds to the body of evidence on the popularity of cycling, particularly on rail trails. Market Equity's survey of five trails in South Australia (interviewing 933 trail users) included the Riesling Trail (a rail trail); the percentage of trail users that were cyclists was quite high at 65% (compared to an average of 29% of cyclists across the five trails).

Many of the cycle touring trips would be confined to bitumen (quiet back country roads etc.) but a significant portion may be interested in an off-road cycling experience. The *New Zealand Cycleway Market Research (2009)* found that, in general, international cycle tourists want easy multi-day trips with good supporting services or events. The holidays can also be location-based and utilise nearby trail networks. Domestic cycle tourists and recreational riders are not primarily focused on cycling but on the broader experience. This group is likely to be older or consist of families rather than single visitors or couples. Both markets are looking for easy access to safe and traffic-free trails. Trail gradient is a critical factor in

successfully designing a trail for a specific market or type of rider. For a large portion of the location-based cycling and cycling holiday market, average trail gradients of 2-3 degrees are required (this explains the popularity of rail trails for this market). The proposed rail trail provides gradients of this small magnitude and thus has the potential to be a successful trail product in this market.

3.4.2.4 Horse Riding

Horse riding is an activity by a relatively small number of participants (around 7% of outdoor recreation activities). Horse riding demand can also be highly localised – certain localities attract residents who are horse riders. A rail trail could offer this opportunity (as it does in some other locations – some 25% of rail trails in Australia allow horse riding).

In summary, the proposed New England Rail Trail would provide experiences for a range of user groups in a series of markets that have been consistent over time – walking and bushwalking and cycling – or growing significantly – off road cycle touring. The trail would provide for both visitors and local people who participate in a range of activities.



If horses are to use the proposed rail trail they will need to share bridges across water courses with other trail users.

3.4.3 HOW LONG DO PEOPLE SPEND ON A TRAIL?

A Victorian study (prepared for the Victorian Trails Strategy 2005-2010) found that there is a clear preference for shorter walks (up to 6 kilometres and taking between 30 minutes and 2 hours to walk) both in metropolitan and “remote” trails.

The Market Equity work in South Australia confirms this finding with 76% of walkers using trails for less than 2 hours. Recent work done by the Bibbulmun Track Foundation showed that 40% of the users spent less than 4 hours on the trail, while another 29% spent between 4 hrs and a day, meaning that 69% of all users (115,000 of a total of 167,000) spent no more than a day on the track (Colmar Brunton 2009). The tremendous success of the Great Short Walks of Tasmania program is testimony to the fact that there is a huge market for this type of walk. Many of the 60 walks promoted through this program are around this length.

Use patterns for cyclists are somewhat different (although most use takes up less than a day). Results from a recent survey carried out by the Queensland Outdoor Recreation Federation (June 2013) on mountain bike riding indicate that the most popular “ideal length

of ride” for biking was 21-30km followed by 10-20km. Most rides are between 1 and 3 hours. Market Equity’s 2004 South Australian work showed slightly different results. The majority of cyclists surveyed (74%) use a trail for 3-4 hours and are more prepared than walkers to travel to use a trail (36% of cyclists interviewed on the five trails were non-locals). The longer times may be due to the fact that the trails involved in the SA study were ‘easier’ than the trails involved in the Queensland study.

Though there is limited background research of how long horse riders seek to ride for, industry knowledge indicates that horse riders are generally looking for rides of approximately 3-4 hours (about 25 -30 kilometres) – in addition to short ‘after school’ or ‘after work’ rides.

There is no doubt that visitors in particular are likely to put aside the time to travel along the potential trail (or parts of it) – people have more time on holidays than they do in their normal day.

3.4.4 WHO USES TRAILS AND WHY?

What sort of person is a trail user? Unfortunately, there is limited Australian research on who uses trails. The limited research that has been done shows some interesting attributes of trail users across Australia:

- ✚ The majority of people (53%) who participate in outdoor recreation are aged between 25 and 54 (*South East Queensland Outdoor Recreation Demand Study 2007*).
- ✚ The single biggest group (53%) of users of the Bibbulmun Track (WA’s primary long-distance walk track) are aged between 25 and 39, with 25% between 15 and 24, and 17% between 40 and 65 (*Colmar Brunton 2009*).
- ✚ The City of Greater Geelong conducted a very extensive survey of walkers (not just on trails) in the City. 82.9% of survey respondents who had a degree or post-graduate qualifications had walked for exercise or pleasure in the last 2 weeks, while only 62.9% of those who had left school in Year 10 or earlier had walked for exercise or pleasure in the last 2 weeks. The authors of this survey concluded that walking participation increases with educational achievement (*City of Greater Geelong 2003*).
- ✚ People using a series of walk and cycle trails in SA (including the Riesling Trail) are motivated by a desire to attain a sense of well-being (95% of users listed this as a motivation), to unwind and relax (91%), to be close to nature (87%), and to be close to family and friends (70%) (*Market Equity 2004*).
- ✚ Taking time out and participating in an activity are more important to domestic cycle tourists than international cycle tourists. On the other hand, exploring a unique place or must-see destination, experiencing local culture and learning about other cultures are all more important to international cycle tourists than their domestic counterparts (*Tourism Resource Consultants 2009*).

Observation of many operating rails trails throughout Australia, New Zealand and North America indicates that there is a very wide diversity of people (and groups) that use rail trails.

The predominant user group for rail trails is cyclists, ranging from elderly people, to baby boomers, young couples, family groups with children, teenagers and young children. Walkers and horse riders are also attracted to rail trails, but in far lesser numbers. They all are using rail trails for a reason: they enjoy routes free from motor vehicles, routes that are away from the noise and smell of roads, and away from trucks and cars.

Rail trails appeal to individuals, to couples, and to groups. In fact, a significant proportion of trail users on the Otago Central Rail Trail on the South Island of New Zealand are groups. These groups consist of sporting clubs, work groups, social clubs, Over 50's groups and organised tour groups. Some use the rail trail for team-building, some use it for fitness training, others for a social club outing. Others cycle and walk the Otago Central Rail Trail simply for the outstanding beauty and scenery that it provides.



Above: a variety of users are encountered on the Otago Central Rail Trail, including many from NSW and elsewhere in Australia.

Beeton's 2009 study of the Murray to the Mountains Rail Trail (north eastern Victoria) found:

- ✚ Of the 128 people interviewed, only 22 identified themselves as living close to the Rail Trail but were all travelling with visitors. Travel companions were evenly spread between travelling with a partner, family or friends, while only a small number of respondents (5 percent) travelled alone.
- ✚ The respondents were predominantly employed in professional and administrative positions (47% and 25% respectively) with 14% retired; however, no respondents identified themselves as unemployed.
- ✚ Ages were varied, ranging from one year old to 79, with a slight majority of men (53%). The largest group was aged between 41 and 60 years old, however the high representation of riders in the 0-10 age groups illustrates the significance of mixed family groups and the suitability of the Rail Trail for all ages.
- ✚ Half of the respondents had past experience in using rail trails and identified the Murray to the Mountains Rail Trail as one they had visited previously. Over half (53%) considered themselves to be frequent riders, cycling more than once a week, but not daily. The next largest group (23%) were regular weekly riders, suggesting that while the trail is being used by people who cycle often, they are primarily recreational cyclists with a quarter who do not cycle regularly.

The Hauraki Rail Trail in New Zealand is particularly popular with the "baby boomer" and family clientele from Auckland and the wider Waikato region. A large proportion of users are older riders (*New Zealand Ministry of Business, Innovation and Employment 2013*).

3.5 HOW MUCH DO TRAIL USERS SPEND?

Successful trails are already attracting large numbers of visitors and they are spending reasonable amounts of money both in the local economies and in the broader economy. The following figures provide a snapshot of expenditures from a range of trails to demonstrate user expenditures.

- ✚ The Mundaring Trails Network, 1 hour from the Perth CBD, injected some \$12.62 million into the local economy and a further \$15.21 million into the State economy annually. Local residents spent \$4.06/visit to the network and visitors (primarily day users) spent \$23.71/visit. The key is that the total number of trips on the trails studied was a staggering 2.454 million visits annually (*Jessop and Bruce 2001*).

- ✚ Users of South Australia's Riesling Trail (a 35 km rail trail in the Clare Valley) who come primarily to use the trail are estimated to spend \$1.08 million/year (\$215/person/visit with daily expenditure of around \$100). This does not count the other 50% of trail users who use the trail as a secondary purpose for their visit (*Market Equity 2004*).

- ✚ The economic impacts of the Bibbulmun Track (WA's long-distance walking track) have been studied over two periods (in 2003 and 2007/08). In 2003, the track was shown to have generated \$21 million of expenditure annually by track users, well in excess of its one-off construction costs of \$5 million (*Colmar Brunton 2004*). More recent figures show an increase in this amount (due to an increase in both users and how much time they spend on the track). The estimated expenditure in 2008 is around \$39 million annually (*Colmar Brunton 2009*). The 2007/08 study shows that the average day walker (some 70% of all users) is spending \$50-\$60/day, while those walking the track for 2-3 days are spending around \$200/visit. Those using the trail for 6 weeks or more, while small in number, are spending \$1,400/visit.



The Otago Central Rail Trail on the South Island of New Zealand is an outstanding success, stimulating the establishment of 20 tour operators that provide logistical support. The rail trail has also stimulated private developments including chalet accommodation at Wedderburn, developed by the owners of an adjoining farming property.

- ✚ The Murray to the Mountains Rail Trail in North East Victoria is one of the better known rail trails in Australia. Research work

undertaken over Easter 2006 (*Beeton 2006*) found that average daily expenditure was \$258/user/day. The bulk of this expenditure was on food and beverage (57% of daily expenditure which equates to \$147/user/day). Beeton applied accepted economic multipliers to these figures and calculated that the direct contribution to the local economy per user per day was in excess of \$480. (Recent follow-up work by Beeton (2009) made similar findings).

- ✚ Users of New Zealand's Otago Central Rail Trail are spending \$NZ 157.30/day with the average length of stay of 3.7 days (*Central Otago District Council 2011*).

There is a range of business opportunities for private sector investors arising from the potential development of a rail trail. Providing accommodation, food and beverages, supported and guided tours, and equipment, are some of the businesses that have arisen along other trails.

It is important to understand how trail users spend their money. Trail users spend money before coming to a trail and in towns and villages along the way. The expenditure data shown below represents an amalgam of existing research data. There are a number of specifically trails-related research projects on user expenditures. These are:

- ✚ Use and Users of the Appalachian Trail: A Source Book (*Manning et al 2000*);
- ✚ Bibbulmun Track User Research Report (*Colmar Brunton 2009*);
- ✚ An Economic Analysis of Rail Trails in Victoria, Australia (*Beeton 2003*);
- ✚ Regional Communities and Cycling: The Case of The Murray To the Mountains Rail Trail, Victoria, Australia (*Beeton 2006*);
- ✚ Cycling in Regional Communities: A Longitudinal Study of the Murray to the Mountains Rail Trail, Victoria, Australia (*Beeton 2009*);
- ✚ Trails Research Project (South Australia) (*Market Equity 2004*);
- ✚ Nga Haeranga – The New Zealand Cycle Trail Evaluation Report (*NZ Ministry of Business, Innovation and Employment 2013*); and
- ✚ Otago Central Rail Trail User Survey 2010/11 (*Central Otago District Council 2011*)

Reviewing the expenditure data from these 8 studies allows an understanding of average expenditure patterns of trail users. Tables 3 and 4 show average amount spent by trail users and the broad sectors in which they spend their money (average expenditure per sector is drawn from most of the studies listed above – not all provided detailed data. The data was collected at different times and noted in different currencies. The figures below represent averages converted to 2017 Australian dollars).

Table 3: Trail user expenditure by category for overnight visitors

(Overnight users include those staying 1 night or more in the region to use a specific trail)

Sector	Average expenditure/day
Accommodation	\$32.44
Food and beverage	\$76.33
Transport	\$26.55
Retail	\$21.68
Other (including cycle maintenance)	\$15.93
TOTAL	\$172.93

Table 4: Trail user expenditure by category for day-trippers

Sector	Average expenditure/day
Accommodation	\$0
Food and beverage	\$33.05
Transport	\$26.55
Retail	no figures available
Other (including cycle maintenance)	\$42.16
TOTAL	\$101.76

The average of \$32.44/day spent on overnight accommodation by overnight visitors includes all users who “camped out” along the trails. Some of these trails (notably the Appalachian Trail and Bibbulmun Track) provided on-trail camping options (for free or at very cheap rates) and consequently accommodation expenditure was relatively low (these low costs may distort the typical expenditure). All the other trails included in the research only provided off-trail accommodation options.

Taking out expenditure on the two long distance walk trails (i.e. those trails offering free or very cheap on-trail accommodation), accommodation expenses range from \$37/day to \$143/day (in 2017 dollars). The most recent data on trail expenditure from the Otago Central Rail Trail (2011) shows that total expenditure was just over NZ\$580 per person per trip covering people doing both part of the trail and the whole trail), with the largest component of expenditure for package expenses (including accommodation). Separate information on accommodation was provided by only a few users who spent an average of NZ\$60/day. A New Zealand study found that users spent an average of NZ\$43/person/night across four trails on off-trail accommodation options only (*NZ Ministry of Business, Innovation and Employment 2013*).

The most recent research data from the Murray to the Mountains Rail Trail (*Beeton 2009*) shows 45% of users spent between \$51 and \$150/night on accommodation. It is worth noting that almost half of the trail users of the Murray to the Mountains Rail Trail listed their employment status as professional (e.g. doctors, lawyers, managers); trail users come from across the economic spectrum but there are many who are potentially high yield visitors.

3.6 WHAT TYPES OF BUSINESSES SERVE RAIL TRAIL USERS?

Identifying specific business opportunities along a trail that may take years to develop is not a simple task. Some success stories from other trails are worth considering.

3.6.1 EQUIPMENT HIRE

While many visitors will bring bikes, some will not and a business opportunity presents itself to address this market. A number of cycle hire, cycle repair and guided cycle tour businesses are accredited businesses under the Munda Biddi Trail Foundation's *Cycle Friendly Business* program. These businesses offer a range of services along the length of the trail and pay an annual subscription fee to remain in the accredited program.

3.6.2 SUPPORTED TOUR OPPORTUNITIES

Cycle tourism is a growing market. Domestic overnight visitors who participate in cycling on their trip stay longer and do more while on holiday when compared with other tourists, making them a stronger source of income for regional communities. Many of the cycle touring trips would be confined to bitumen (quiet back country roads etc.) but a significant portion may be interested in an off-road cycling experience. International visitors participating in cycling spend \$NZ3,800/person/visit while in New Zealand compared with the average of \$NZ2,500/person/visit for all other categories of international visitor. 22% of cycle tourists spend more than \$5,000/person/visit (*Nga Haeranga – The New Zealand Cycle Trail Evaluation Report 2013*).

Supported tour opportunities are offered on Otago Central Rail Trail where some 10% of visitors take advantage of this service. A recent survey by the Otago Central Rail Trail Trust showed that total expenditure was \$NZ472.61 per person per trip along the rail trail. The largest component of expenditure is on package expenses (as it was in 2008/2009 when a previous survey was carried out). 'Off the Rails' is one such bicycle tour company that offers premium, eco-friendly and fully supported bike tours. The company offers various tours including accommodation, bike hire and guided sightseeing activities. All tours include transfers, care of all luggage during the tour and meals, providing a fully inclusive cycling experience. A key to its success is its ease of planning/organising for visitors – once the tour is booked in they do not have to think about anything else. (*SGS Economics and Planning and Quantum 2012*)

Such services are not confined to cycling tours. These services are also offered on the Bibbulmun Track. The Bibbulmun Walking Breaks (run by the Bibbulmun Track Foundation) provide packages for those who enjoy walking but do not want to carry a heavy pack or camp overnight. In 2002, the Walking Breaks program won a national award for innovation in travel in the Jaguar Awards for Excellence. The Foundation organises "best of the

Bibbulmun 8-day tours”. Both of these tours are carefully compiled to combine a variety of day walks with off-Track accommodation. A bus service transports users to the Track each day and returns them to accommodation in rural towns and villages at the end of the day. On the walks, users carry only a small daypack carrying food and other items.

A number of private providers offer similar supported activities on a number of trails – both walking and cycling. Tour de Vines – a cycling company – offers various cycling tours on Australian rail trails (as well as other cycle touring opportunities in Australia and overseas) (see <http://tourdevines.com.au/cycling-tours/cycling-tours-australia>).

Qualitative research done by SGS Economics and Planning and Quantum (2012) (focusing on Victoria’s north east) indicates respondents wanting activities and experiences that are easy to organise – the ‘facilitated’ experience, which would complement the existing 100km of scenic and safe trails through iconic rural villages. Facilitated itineraries would seek to emulate the best facilitated road cycling experiences in Europe, including the provision of regional interpretation, food and wine. The report noted that the North East’s Rail Trail is a key asset for the region, providing infrastructure from which a cycling experience could be leveraged.

The *Destination Country and Outback NSW’s Destination Management Plan 2018* notes a global trend that tourism activities such as tours are finally coming into their own. However, the focus is on small-scale, immersive and locally curated activities. This is particularly important in relation to Indigenous and nature-based tourism.

While the Black Mountain to Ben Lomond section of the proposed New England Rail Trail is not a long trail and would be unlikely on its own to warrant development of businesses offering supported tours, an extension of it to Armidale and to Glen Innes could provide an incentive to develop a package which included the longer trail. Alternatively, the shorter rail trail could be packaged with other trails (particularly walk trails) and other outdoor recreation experiences in the New England region to provide opportunities for supported tours.

3.6.3 GUIDED WALKING/CYCLING TOURING

This facility provides an even greater level of support for trail users; all “traversing” is done with the accompaniment of a knowledgeable guide (as well as the provision of all necessary equipment).

This type of service is offered on the Great Ocean Walk (e.g. Bothfeet Walking Lodge and Tours). Internationally renowned adventure company World Expeditions offer a 7-day guided and supported hike along the Bibbulmun Track. One of the key features of these packages is that users simply pay just one flat fee for their entire holiday.

Comments on the length of the trail above apply.

3.6.4 OFF-TRAIL ACCOMMODATION

There is some opportunity to provide users with off-trail accommodation of varying qualities (adding to the existing stock of options) as the trail passes private property. Riesling Trail Cottages and Riesling Trail Bush Cottages provide self-contained accommodation adjacent to South Australia's famous Riesling Trail through the Clare Valley. When these were first constructed, the owner was often asked "How close are your cottages to the wineries"; over time, the more common enquiry became "how close are the cottages to the rail trail".



Several accommodation establishments are clearly benefiting for locating close to the Riesling Trail, resulting in economic benefits to the businesses and a bigger range of accommodation options cyclists and walkers using the trail.

3.6.5 SUPPORTING EXISTING BUSINESSES

A trail increases the opportunities offered to existing businesses that currently provide relevant services to provide such services on a more regular basis. These types of examples are critical economic opportunities to diversify and solidify the sub-region's economic base. In New Zealand across four recreation trails subject to detailed research (*New Zealand Ministry of Business, Innovation and Employment 2013*), 1 in 5 businesses surveyed reported that they had either expanded their services (e.g. added capacity) or added new services since the trail opened in their region. These ranged from provision of cycle tours to cellar door tasting sessions, but were commonly in the provision of accommodation, transport or shuttles, or cycle hire. There was anecdotal evidence that trails have been beneficial for existing businesses either by absorption of existing excess capacity and by spreading the risk through the diversification of product.

3.7 CONCLUSION

Australians are increasingly looking for passive, non-organised recreation opportunities, often in natural or near-natural settings. Demand for this type of opportunity will only increase as the population ages. While walking remains the most popular of these activities (and is likely to remain so as the population ages), off-road cycling shows a growing and often unmet demand within the trails market.

The New England Rail Trail (particularly if built to connect Armidale and Glen Innes) would provide experiences for a range of user groups in a series of markets that have been consistent over time – walking and bushwalking and cycling – or growing significantly – off road cycle touring. The trail would provide for both visitors and local people who participate in a range of activities. The potential expenditures may be quite significant based on trail user expenditures elsewhere.

SECTION 4 – BUSINESS CASE

4.1 INTRODUCTION

It is always difficult to predict the economic impact of a new trail. Visitor numbers on the Bibbulmun Track (in WA) grew from 10,000 when the new alignment was first opened in 1997 to 137,000 in 2004 (*Colmar Brunton 2004*) to over 167,000 in 2008 (*Colmar Brunton 2009*). This was on a trail that had existed in its entirety for many years but was substantially altered and reopened in 1997 (although new sections of it had been opened prior to its grand opening). Visitors included those on 'local trips', day trips and overnight or longer stays (including those who travelled from end to end).

A dramatic increase in visitor numbers such as experienced by the Bibbulmun Track can be, in part, attributed to very good marketing of the track. The economic impact of the proposed New England Rail Trail is primarily dependent on the extent to which the trail is marketed and promoted (if it proceeds).

A trail such as the proposed New England Rail Trail will have attraction to visitors – daytrippers and overnight visitors. However, it will also add to the stock of existing trails for local people – people who live in Guyra, Armidale, Glen Innes and surrounding areas. Some of these people will use the trail for exercise – these 'back gate' users may not be significant in terms of expenditure, but they are significant in terms of numbers as they would use the trail many times a year.

One of the key attractions of developing this rail trail is the opportunity to provide a rail trail experience for residents of NSW in NSW. The NSW State Government has indicated that one of the key outcomes it is seeking from tourism projects is to reduce the "leakage" of expenditure i.e. money being spent by NSW residents in other states (and countries) on holidays. This is in addition to attracting holiday makers from other States and countries. There is limited research data on this issue associated with rail trails. Beeton's 2009 study of the Murray to the Mountains Rail Trail in North East Victoria showed that, of the 60,000 trail users/year, around 14% of them (8,400) were from NSW with a roughly even split between Sydney and Regional NSW (this was consistent with an earlier study of the same rail trail). These visitors were expending an average of \$332/day (in 2017 dollar terms). This is quite significant. The Queensland Government has committed to spending \$14 million developing rail trails over the next 3 years. The recently finished Brisbane Valley Rail Trail in Queensland is now the longest rail trail in Australia. Both of these developments have the potential to attract interstate visitors. Research for the New Zealand Government showed Australia is the biggest international market for cycle tourism in New Zealand, accounting for some 23% of international cycle tourists. 15% of users on the Otago Central Rail Trail came from Australia (*Central Otago District Council 2015*). Anecdotal evidence shows that many NSW residents interested in rail trails are heading to Victoria and New Zealand to have these experiences not currently on offer in NSW.

Many of these trail users will be interested in using a rail trail developed in NSW thus reducing the expenditure leakage. A trail such as the New England Rail Trail will also attract interstate visitors particularly from Queensland which is already providing a significant number of visitors to the region (some 22% of all visitors).







4.2 VISITING TRAIL USERS

There is no doubt from available evidence that recreation trails attract visitors who may come to a region specifically to do a trail (for example in 2004, 50% of visitors to South Australia's Riesling Trail came to the Clare Valley specifically to walk or ride the trail – the other 50% used the trail as a secondary activity to their trip to the Clare Valley).

The Ben Lomond to Black Mountain Rail Trail has the potential to add to the number of existing visitors. Extending the trail south to Armidale and north to Glen Innes has the potential to attract significantly more users. The short trail will attract new day trippers (day trippers in this instance would be different from local residents) and encourage existing overnight visitors to extend their stay as it provides another attraction for the region. The longer trail will have these impacts; in addition, it will attract new overnight visitors solely (or primarily) to ride or walk the trail.

The length of the short trail (at 34 kms) is an ideal length for cyclists (who are the primary users of rail trails), while the longer trail (at 103 kms) provides for a perfect 2 - 3 day bike ride to attract new users. As a rail trail, the corridor is reasonably flat and will therefore accommodate the full range of cyclists, as well as walkers.

Reiterating visitor numbers from Section 3:

-  1.607 million domestic overnight visitors visited the wider region (North West New England) in the year ending March 2018. 50% of these came from elsewhere in Regional NSW while 17.6% came from Sydney. (22.7% came from Queensland, suggesting proximity to Queensland is an attraction).
-  Armidale Regional Council received 268,000 domestic overnight visitors. Glen Innes Severn Council received 97,000 domestic overnight visitors.
-  42,100 international visitors visited the region in the year ending March 2018.
-  Armidale Regional Council received 9,000 international visitors. No figures are available for Glen Innes Severn Council.
-  1.759 million day trippers visitors visited the region in the year ending March 2018. Day trippers are almost exclusively from within the region (this is not surprising given the size of the region).
-  Armidale Regional Council received 313,000 day trippers. No figures are available for Glen Innes Severn Council.

In the analysis that follows, two complete cases are presented – the short trail (Ben Lomond to Black Mountain) and the longer trail (Armidale to Glen Innes).

4.2.1 VISITING TRAIL USERS – PREDICTING USER NUMBERS

What is a reasonable forecast for trail user numbers (some existing visitors will stay longer to experience the trail, and some will come to the region as new visitors simply to use the trail)? Nature visitors who participate in the types of activities undertaken on tracks and trails provide a pointer to the market potential for a trail such as the proposed New England Rail Trail. Tourism Research Australia estimates that 51% of domestic overnight nature visitors take part in bushwalking / rainforest walks, whilst 39% of domestic day visitors and 37% of international visitors enjoy this type of activity. While the proposed trail does not

necessarily provide a bushwalking experience, it does provide an opportunity for nature visitors.

Victoria attracted 320,000 cycle tourists (domestic and international) in 2010 (Victoria's Cycle Tourism Action Plan 2011-2015). A proportion of these would be interested in off-road cycle touring on a trail such as the New England Rail Trail.

4.2.1.1 Projected User Scenarios – Day-trip Usage

General Comments

Any trail has the potential to add to the number of day trippers. The day trip market will be a significant market for a trail.

The Mundaring Shire trail network (in WA) is just under 1 hour from the Perth CBD. In the Mundaring case, 180,000 visitors (from outside the Shire) make over 900,000 visits/year (an average of 5 visits/person). The majority of these visitors come from Greater Perth (a population of 1.5 million at that time) and are day trippers. Some 12% of Perth residents visit the trail network.

Market Equity's work in South Australia shows that a significant percentage of cyclists on surveyed trails are more prepared than walkers to travel to use a trail (36% of cyclists interviewed on the five trails were non-locals) (*Market Equity 2004*).

It is difficult to predict with any certainty what effect development of any trail will have on the day trip market in the region as comparative work on other trails simply does not exist. However, the Lilydale Warburton Rail Trail provides a reasonable 'shadow' market for making some estimates. The trail attracts a large number of day trippers, with 100,000 of the 105,000 annual visitors being day trippers (some 3% of the day tripper market to the Yarra Valley and Ranges). The trailhead at Lilydale is 40 minutes by car from Central Melbourne and an hour by train. It is very well positioned for day trippers. The Trail is in an established tourism area – the Yarra Valley and Ranges – with a wide range of tourist infrastructure and attractions. In 2013, the Yarra Valley and Ranges region attracted 663,000 domestic overnight visitors and 3.1 million day trippers. The Yarra Valley and Ranges are very attractive natural environments, another positive factor attracting trail users.

Expenditure is also quite significant. Day tripper expenditure (based on a number of studies) is \$101.76/day with \$33.05 (or 32%) of this spent on food and beverage – most of which is likely to be spent in the region.

New England (Ben Lomond to Black Mountain) Rail Trail

The trail end points (Ben Lomond and Black Mountain) are within 2 hrs of two of the major population centres of the region. Tamworth (with a population of over 59,000) is less than 2 hours from Black Mountain (and just over 2 hrs from Ben Lomond) while Armidale (the city), with a population of almost 25,000, is within 25 minutes of Black Mountain. Glen Innes (with a population of almost 9,000 in the Local Government Area) is 30 minutes from the northern terminus and Tenterfield (a population of almost 7,000 in the Local Government Area) is within 2 hours of the northern terminus. This puts the rail trail within 2 hours of around 100,000 people. It is worth reiterating that day trips within the broader region (North West New England) are almost exclusively from within the region. The Region includes these cities and towns.

A trail developed along the old railway corridor between Ben Lomond and Black Mountain may attract in the order of 5,000 additional day trippers/year (specifically to use the trail). This number represents:

- ✚ around 0.3% of the existing day tripper market to the entire region;
- ✚ around 1.6% of the existing day tripper market to Armidale Regional Council; and
- ✚ 5% of the population within 2 hours of the trail.

Increasing day trippers to the region by 5,000/year will result in an injection of some \$508,800 into the local economies per year (based on the average figures of \$101.76).

New England (Armidale to Glen Innes) Rail Trail

The potential day trip market may actually be reduced simply because Armidale could be taken out of considerations (and becomes part of the local user market). However, it could be argued that residents of Armidale who wanted to ride the northern section (Ben Lomond to Glen Innes) are day trippers as opposed to local users. The same argument can be mounted for residents of Glen Innes who wish to use the southern section (Armidale to Black Mountain).

Armidale is within 2 hours of Tamworth (with a population of over 59,000). Tenterfield (a population of almost 7,000 in the Local Government Area) is within 1 hour of the northern terminus. Stanthorpe (population of just over 5,000) would be within 2 hours of the trail's northern terminus. This puts the longer rail trail within 2 hours of around 71,000 people (from outside its region, having removed Armidale and Glen Innes from this 2 hour catchment). It is worth reiterating that day trips within the broader region (North West New England) are almost exclusively from within the region. The Region includes these cities and towns (Stanthorpe is outside this region).

It is reasonable to conclude that day trippers from Armidale (to the northern section) and from Glen Innes (to the southern section) should be included in any consideration of possible day tripper numbers. It is also reasonable (given this scenario) to state that a trail developed along the old railway corridor between Armidale and Glen Innes may attract in the order of 5,000 additional day trippers/year (specifically to use a part of the trail). A proportion of these are likely to become repeat visitors to use the other sections of the trail. This assumes they would ride the entire trail in three sections (Armidale to Black Mountain, Black Mountain to Ben Lomond, Ben Lomond to Glen Innes). This sectional approach to completing a trail is not uncommon and is a source of many visitors to longer trails (the Appalachian Trail in the USA and the Bibbulmun Track in WA are examples where significant number of users complete the trail by walking parts of it at one time). It is assumed that of these 5,000 new day trippers, 50% will be keen to do the entire trail over time and they will take 3 days to do it. This adds another 5,000 day trippers (2,500 visitors revisiting on 2 occasions). The longer trail will therefore generate an additional 10,000 day trippers.

This number represents:

- ✚ around 0.6% of the existing day tripper market to the entire region;
- ✚ around 3.2% of the existing day tripper market to Armidale Regional Council; and ✚ 10% of the population within 2 hours of the trail (counting Armidale and Glen Innes within this calculation).

Increasing day trippers to the region by 10,000/year will result in an injection of some \$1,017,600 into the local economies per year (based on the average expenditure figures of \$101.76).

4.2.1.2 Converting Day Trips to Overnight Trips

General Comments



Trail development may also turn day trippers into overnight trippers with consequent rise in economic benefits. The trail provides an additional activity for visitors – an overnight stay will give visitors time to walk or ride the trail in addition to their other activities. Overnight visitors to trails are spending an average of \$172.93/person/day.

New England (Ben Lomond to Black Mountain) Rail Trail

The likely scenario would be that some visitors to the region will turn day trips into overnight stays if a trail is provided as an additional activity.

If the trail converted 2,000 day trippers into overnight visitors, this would inject an additional \$345,860/year into the economy based on overnight visitor expenditure of \$172.93/day. If they stay overnight to undertake the trail journey, they would undertake other activities as well over the course of their stay. The benefit of the 2nd or subsequent day's stay cannot be attributed to the trail.

This number represents:

-  around 0.1% of the existing overnight visitor market to the entire region; and
-  around 0.5% of the existing overnight visitor market to Armidale Regional Council and Glen Innes Severn Council areas.

New England (Armidale to Glen Innes) Rail Trail

The longer rail trail may encourage people to stay longer to do more of the rail trail (than simply the Ben Lomond to Black Mountain section). They may stay longer to ride two or three trail sections. Some who might otherwise stay overnight to ride an extra section may in fact decide to make the rail trail a single purpose trip (i.e. a trip to only do the rail trail) and these are covered in 4.2.1.4. It is reasonable to conclude that the longer rail trail would increase the number of people converting a day trip to an overnight trip by only a small margin compared to the shorter trail i.e. an additional 2,500 visitors injecting \$432,325/year into the economy.

4.2.1.3 Encouraging Existing Overnight Visitors to Stay Longer

General Comments

It is likely that the key market for the shorter trail in particular (in terms of visitors) will be in providing an additional facility for visitors already coming to the region. Such an additional facility will encourage them to extend their stay to allow an extra day (or part of a day) to use the trail. The trail (either the short trail or parts of the longer trail) could be included in a package of outdoor recreation opportunities and this is likely to attract users. A trail would be a good inclusion in a package with other tourist attractions. Such a package makes an appealing weekend away or an incentive to stay a day or two longer.

Good marketing of such a package would mean that overnight stays in the region would increase accordingly. This has a significant impact on economic benefits, as people who stay overnight spend considerably more than those who come for a day only.

New England (Ben Lomond to Black Mountain) Rail Trail

If 2,000 visitors stay an extra day to use the trail, this would inject an additional \$345,860/year into the economy. Additional expenditure as a result of their overnight stay – primarily but not only accommodation – can be attributed to the trail.

This number represents:

- ✚ around 0.1% of the existing overnight visitor market to the entire region; and
- ✚ around 0.5% of the existing overnight visitor market to Armidale Regional Council and Glen Innes Severn Council areas.

New England (Armidale to Glen Innes) Rail Trail

The longer rail trail may encourage people to stay longer to do more of the rail trail (than simply the Ben Lomond to Black Mountain section). The rationale is similar to the rational outlines in 4.2.1.2, meaning that an additional 2,500 visitors would extend their stay and inject \$432,325/year into the economy.

4.2.1.4 Attracting New Overnight Visitors

General Comments

It is likely that the fundamental difference between the short trail and the longer trail will be the ability of the longer trail to attract new overnight visitors to the region. This is a growing area of trails marketing, where regions are looking to have either a longer trail (a trail that can be traversed in 2-3 days such as the Otago Central Rail Trail in New Zealand) or a cluster of shorter trails that make an overnight or longer visit to a region very attractive. The longer New England Rail Trail falls into the former category, providing an attraction that will motivate visitors to come to the region primarily for the trail (they may undertake other activities while in the region). It is unlikely that someone would drive or fly from Sydney or Brisbane primarily to undertake a 34 kilometre trail journey. The Lilydale Warburton Rail Trail in Victoria's Yarra Valley provides a good example. As discussed above, it attracts 105,000 visitors/year; 100,000 of these are day trippers. There are a limited number of "long" rail trails currently in Australia. The recently completed Brisbane Valley Rail Trail (Queensland) is the longest rail trail at 161 kilometres long. The Great Victorian Rail Trail is 134 kms long. The Murray to the Mountains Rail Trail (Victoria) is 116 kilometres. Victoria has another 6 rail trails between 50 and 100 kilometres long. The Murray to the Mountains is probably the most successful of the long trails with 60,000 users/year. Trail users make a weekend (or longer) trip on the trail. The success of the Otago Central Rail Trail in New Zealand (a distance of 150 kilometres) in attracting over 14,000 users per year to traverse its entire length (a larger number traverse shorter lengths of the trail) further highlight the appeal of the long rail trail. The rise in use of other long trails (not rail trails) in recent years points to an increasing demand for this type of trail experience. User numbers on the Bibbulmun Track (WA), the Munda Biddi Trail (WA), the Pilgrims Way (Spain and France), and the Kokoda Track (PNG) have increased quite markedly in recent years. They offer different sorts of experiences, but they are all long trails (with options to do short sections – with the exception of the Kokoda Track). Many of the longer trails offer supported and

guided experiences opening up trails to people who may previously have not considered doing a trail activity. The advent of e-bikes with their capacity to travel much further in a day may also in time increase the demand for long trails.

New England (Ben Lomond to Black Mountain) Rail Trail

The shorter trail is unlikely to attract users for the primary purpose of using the trail – it will be an add-on to additional activities as detailed above.

New England (Armidale to Glen Innes) Rail Trail

The longer trail will attract users for the primary purpose of riding (or walking) the trail offering a 2 - 3 day ride (and a longer walk of the order of 4-5 days). Given the numbers of users that are on other trails, it is reasonable to estimate that a new long rail trail highlighting the New England region is likely to attract 5,000 new overnight visitors for the sole (or primary) purpose of cycling or walking the trail. The rail trail's proximity to South East Queensland, and major coastal cities in Northern and Central NSW (as well as easy access from Sydney) will be a major attraction (the region already attracts some 22% of its visitors from Queensland). The length of time taken to traverse the trail will vary between user groups and between users. However, for the purposes of calculating economic impact, it is assumed that users will take 3 days to traverse the trail. The majority of users are likely to be bike riders, some of whom will traverse the trail in 2 days. Allowing a 3 day traverse covers more bike riders and walkers (and horse riders if permitted).

5,000 new users will inject \$2,593,950/year into the local economies (based on a 3 day average stay and an average spend of \$172.93/day).

This number represents:

- ✚ Around 0.3% of the existing overnight visitor market to the entire region; and ✚
- Around 1.3% of the existing overnight visitor market to Armidale Regional Council and Glen Innes Severn Council areas.

In summary, possible visitor numbers are shown in Tables 5 and 6.

Table 5: New England (Ben Lomond to Black Mountain) Rail Trail:

Possible Visitor Numbers and Associated Expenditure: A Summary

Category	Predicted visitor numbers/year	Predicted expenditure/year
New day trippers	5,000	\$508,800
Day trippers converting to overnight stays	2,000	\$345,860
Overnight stays being extended by a day to use the trail	2,000	\$345,860
Attracting new overnight visitors	0	0
Total visitor numbers	9,000	\$1,200,520




*Table 6: New England (Armidale to Glen Innes) Rail Trail:**Possible Visitor Numbers and Associated Expenditure: A Summary*

Category	Predicted visitor numbers/year	Predicted expenditure/year
New day trippers	10,000	\$1,017,600
Day trippers converting to overnight stays	2,500	\$432,325
Overnight stays being extended by a day to use the trail	2,500	\$432,325
Attracting new overnight visitors	5,000	\$2,593,950
Total visitor numbers	20,000	\$4,476,200

There may be additional people who use the trail as part of their visit to the region. While they add to the total number of trail users, their expenditure cannot be counted in any economic analysis of the trail's benefit as the presence of the trail is not the primary attraction for these visitors. As noted above, 50% of visitors to South Australia's Riesling Trail came to the Clare Valley specifically to walk or ride the trail – the other 50% used the trail as a secondary activity to their trip to the Clare Valley. The economic contribution of the latter 50% is not counted as an economic benefit of the trail.

How does this figure compare to what is happening on other trails in Australia? Research figures are limited and tend to focus on iconic trails – the Bibbulmun Track (167,000/yr) and the Munda Biddi Trail (21,000/yr) in Western Australia, the Murray to the Mountains Rail Trail (60,000/yr), the Great Ocean Walk (100,000/yr) and the Wilsons Promontory Walk (60,000/yr) – all in Victoria.

Other less iconic trails provide good pointers to likely use of the New England Rail Trail.

-  In 2005, South Australia's Riesling Trail attracted 11,000 visitors/year. Recent trail counters show that over 40,000 people passed through 4 trail counters each year. While this does not necessarily translate to 40,000 users (as many would pass more than one counter), it suggests more users than the 2005 figures. This trail is 2 hrs from Adelaide in the renowned tourist area of the Clare Valley.
-  Over 23,000 users passed through counters on the Old Beechy Rail Trail in 2013. Again, this does not necessarily translate as over 23,000 users, but it gives an indication of use rates.
-  Around 27,500 users passed through counters on the Great Victorian Rail Trail in the first quarter (January-March) of 2014. Again, this does not necessarily translate as 27,500 users, but it gives an indication of use rates.

The predicted user numbers are an "end state" of user numbers. Trail numbers will build in the first 5 years of a trail section being opened (after 5 years a trail is a "mature product"). It is assumed that trail use will increase by steady increments. The available evidence is limited and tends to show that trail use starts slowly but grows very quickly at some point - the Bibbulmun Track for example grew from 10,000 in 1997 to 137,000 in 2003 to 167,000 in

2007. It may be that the growth of social media will see trails reach an “end state” of use much faster than previously.

4.3 LOCAL TRAIL USERS

Every regional trail is a local trail. Therefore, it is important not to overlook the contribution of local residents to the success of a trail. In 2001, the Mundaring Shire trail network was used by over 200,000 people (Jessop and Bruce 2001), having grown from a low base when the network was first fully opened. Only 10% of these users were locals (residents of Mundaring Shire) with many other users drawn from the Perth metropolitan area. The total annual visits (people generally use trails more than once a year) were a staggering 2.454 million visits annually, with local residents accounting for 63% of these visits. The average number of trips per year per local resident was 75 (compared to the 10-30 trips used in the following forecasts).




4.3.1 ESTIMATING LOCAL USER NUMBERS

What is the likely scenario for local trail users? The Mundaring figures show 63% of the local population making an average of 75 trips/year. It is difficult to know how far people will travel to take advantage of a local recreation facility. 20 minutes travel is a reasonable figure to estimate the “local catchment” of a trail.

New England (Ben Lomond to Black Mountain) Rail Trail

There are three villages within 20 minutes of the trail (Black Mountain, Guyra, and Ben Lomond). Llangothlin is also on the trail but reliable population numbers are hard to find. The combined population of the three villages is 2,489 (according to the 2016 Census).

Three possible scenarios can be used in calculating likely local user numbers. These are:

-  A Low/low scenario - 10% of the combined population within 20 minutes of the trail making 10 visits/year to the trail.
-  A medium/medium scenario - 20% of the combined population making 20 visits/year to the trail.
-  A high/high scenario - 30% of the combined population making 30 visits/year to the trail.

The next step is to estimate total trip numbers. In the Mundaring study, the average number of trips per year per local resident was 75. Table 7 provides three visitation scenarios taking a far more conservative approach compared to the actual visitation rate coming from the Mundaring study.

Table 7: Potential Total Annual Visits by residents

(Population of the four centres within close proximity to the trail – 2,489)

Category	Low trail usage: 10% of residents	Medium trail usage: 20% of residents	High trail usage: 30% of residents
Low (10 visits/yr)	2,489	4,980	7,470
Medium (20 visits/yr)	4,980	9,960	14,940
High (30 visits/yr)	7,470	14,940	22,410

Local users also spend money while using trails. Expenditure per trip by local residents is always lower than for visitors, as locals are closer to home and more likely to either take all that they need or come home to eat and drink following a trail visit. The expenditure figures from the Mundaring study (\$1.44/person/trip in the Shire – mainly food and drink) are a legitimate base to work from (and have been converted to 2017 dollars - \$2.15/person/trip).

Using this figure in combination with visitation scenarios generated in Table 7 gives a range of expenditure estimates. Table 8 shows a simplified set of three scenarios: low usage / low number of trips, medium usage / medium number of trips, and high usage / high number of trips.

Table 8: Potential Total annual expenditure in the vicinity of the trail by residents

(low, medium and high refer to the use rates developed in Table 7 above)

Use Scenario	# of person visits	Total spent (\$)
Low/low	2,489	5,351
Medium/medium	9,960	21,414
High/high	14,940	32,121

What is the likely scenario for local trail users? The Mundaring figures show 63% of the local population making an average of 75 trips/year. The New England Rail Trail will be the only trail in the area. Somewhere flat to walk or ride would be very popular.

Given these figures, it would seem the medium/medium scenario of 9,960 person visits (i.e. 20% of the 'local' population using the trail for 20 visits per year) is a reasonable, if very conservative, scenario to adopt (conservative when compared with the Mundaring data). Such visitor numbers would inject \$21,414/year into the local economy. Due to the small local population, economic benefits flowing from local trail use will be relatively low.

New England (Armidale to Glen Innes) Rail Trail

Under this scenario, residents of Armidale, Black Mountain, Guyra, Ben Lomond, Glencoe and Glen Innes are within 20 minutes of the trail. The combined population of these cities, towns and villages is 34,947 (according to the 2016 Census).

Using the same process as for the shorter trail, Table 9 provides three visitation scenarios.

Table 9: Potential Total Annual Visits by residents

(Population within close proximity of the trail – 34,947)

Category	Low trail usage: 10% of residents	Medium trail usage: 20% of residents	High trail usage: 30% of residents
Low (10 visits/yr)	34,947	69,894	104,841
Medium (20 visits/yr)	69,894	139,788	209,682
High (30 visits/yr)	104,841	209,682	314,523

Using the expenditure figure as discussed above, in combination with visitation scenarios generated in Table 9 gives a range of expenditure estimates shown in Table 10.

Table 10: Potential Total annual expenditure in the vicinity of the trail by residents

(low, medium and high refer to the use rates developed in Table 9 above)

Use Scenario	# of person visits	Total spent (\$)
Low/low	34,947	75,136
Medium/medium	139,788	300,544
High/high	209,682	450,816

What is the likely scenario for local trail users? While the rail trail would be an attractive option, there are more options for cycling particularly in the Armidale area (unlike the Guyra area). Trail users may simply be switching from one existing trail to the new trail if constructed – these users cannot be counted as providing additional expenditure as they are not new users. Given these comments, it would seem the low/low scenario of 34,947 person visits (i.e. 10% of the 'local' population using the trail for 10 visits per year) is a reasonable, if very conservative, scenario to adopt (conservative when compared with the Mundaring data). Such visitor numbers would inject \$75,136/year into the local economy. (It should be reiterated that these users are those who travel up to 20 minutes to use the trail – primarily for exercise). As discussed under day tripper numbers, residents of Armidale (the city) who choose to use the northern trail section (Ben Lomond to Glen Innes) and residents of Glen Innes who use the southern section (Armidale to Black Mountain) should be counted as day trippers as their trip is longer and they would consequently spend more money.

4.3.2 LOCAL TRAIL USERS – HOW LONG WILL THEY SPEND ON A TRAIL

The evidence is that most trail users spend up to 4 hours on a trail (walking or cycling). However, local people using the trail as part of an exercise regime are likely to have different time use patterns. The most recent Exercise, Recreation and Sport Survey (2010) shows that those who regularly exercise do so for between 2 and 5 hours/week and the median number of exercise "events" was 1.6 times/week. It is reasonable to assume (for the purposes of calculating potential hours of exercise on the trail) that each use will be for 1 hour.

Using this assumption and combining it with the forecast user numbers, it is likely that there will be an additional 9,960 hours (if the shorter trail is developed) and an additional 34,947 hours (if the longer trail is developed) of additional physical activity in the local communities along the trail.

4.4 PROJECTED USER SCENARIOS - SUMMARY

New England (Ben Lomond to Black Mountain) Rail Trail

With the right marketing, the trail will attract local users, day trippers and visitors. Under a relatively conservative scenario, the following outcomes are achievable:

- ✚ Significant local use (in terms of relative proportions of the population)– almost 10,000 local users/year is a reasonable expectation. This will result in an economic injection of \$21,414/year;
- ✚ Expansion of the existing day tripper market to the region. 5,000 new day trippers/year will yield an injection of \$508,800/year.
- ✚ With a new significant recreation attraction, some day-trippers may stay overnight, generating a new income stream. If the trail converted 2,000 day trippers into overnight visitors, this would inject an additional \$345,860/year into the economy.
- ✚ If 2,000 visitors stay an extra day to use the trail (or use a package of trails including the New England Rail Trail), an additional \$345,860/year injected into the economy.

The total injection of dollars into the local economies from local, day trip and overnight visitors may be of the order of \$1,221,934/year (under a range of conservative scenarios). Complex economic analysis (beyond the scope of this project) is needed to determine how many jobs are likely to be created by such expenditure.

New England (Armidale to Glen Innes)) Rail Trail

With the right marketing, the trail will attract local users, day trippers and visitors. Under a relatively conservative scenario, the following outcomes are achievable:

- ✚ Significant local use – almost 35,000 local users/year is a reasonable expectation. This will result in an economic injection of \$75,136/year;
- ✚ Expansion of the existing day tripper market to the region. 10,000 new day trippers/year will yield an injection of \$1,017,600/year.
- ✚ With a new significant recreation attraction, some day-trippers may stay overnight, generating a new income stream. If the trail converted 2,500 day trippers into overnight visitors, this would inject an additional \$432,325/year into the economy.
- ✚ If 2,500 visitors stay an extra day to use the trail (or use a package of trails including the New England Rail Trail), an additional \$432,325/year injected into the economy.
- ✚ A long trail highlighting the best of the New England Region would attract new visitors to the region solely (or primarily) to do the trail. An additional 5,000 visitors would inject \$2,593,950/year into the local economy.




The total injection of dollars into the local economies from local, day trip and overnight visitors may be of the order of \$4,551,336/ year (under a range of conservative scenarios).

Complex economic analysis (beyond the scope of this project) is needed to determine how many jobs are likely to be created by such expenditure.

It should be emphasised (under both scenarios) that user and visitor numbers will not necessarily be realised in the first years of operation if the trail proceeds.

4.5 BUSINESS BENEFITS

The completion of a trail would not simply provide an injection of funds to stabilise and grow existing and new businesses (as discussed in Section 3). The psychological impact on businesses can also be very important. Work done for the Riesling Trail included some qualitative research using focus groups consisting of business operators (*Market Equity 2004*). The key responses included:

-  A belief amongst business providers that the trail contributes to economic activity in the region.
-  The trail is seen to attract a variety of visitor types to the region, with wine as well as non-wine interests.
-  The trail is seen as highly important to businesses in the area. Businesses were passionate about the trail and believed it contributed to their businesses as well as helping to position the area as an authentic leisure holiday destination. The exact impact in measurable terms could not be clearly ascertained, as it is so intrinsically linked to businesses in the region, but there was a definite opinion that the Clare Valley would not be the same without the trail and that it had contributed to business formation as well as business growth.



Business opportunities were discussed in Section 3, but it bears reiterating that the trail offers a range of new business opportunities and the opportunity for existing businesses to extend their offerings.

It should also be noted that the trail construction process itself will provide an economic input to the region. Armidale Regional Council is developing a Local Buy policy aiming at ensuring that as high a percentage as possible of its purchases are done within the region (notwithstanding Government requirements about competitive neutrality).

4.6 NON-ECONOMIC BENEFITS

There are a range of non-economic benefits accruing to local and wider communities from trail construction and use.

4.6.1 HEALTH RELATED ECONOMIC BENEFITS TO THE WIDER ECONOMY

-  Data from the USA indicates that every \$1 of funds spent on recreational trails yield direct medical benefits of \$2.94 (*Wang et al 2005*).
-  Both the shorter and longer trail will encourage people to exercise – the economic benefit to society of getting an inactive person to walk or cycle is between \$5,000 and \$7,000/year. The economic benefit to society of getting an active person to walk or cycle is between \$850 and \$2,550/year (*Institute of Transport Economics 2002*). Increasing recreational options for local communities will aid overall community wellbeing.

- Participation in trail activities can improve physical and mental health, assisting with disease prevention particularly cardiovascular, musculoskeletal, respiratory, nervous and endocrine systems as well as reducing obesity, hypertension, depression and anxiety. The obesity epidemic alone is now estimated to cost Australia \$1.3 billion/year (*Australian Bicycle Council*). One heart attack is estimated to cost in the vicinity of \$400,000 in direct and indirect costs.

4.6.2 QUANTIFIABLE BENEFITS TO INDIVIDUAL RESIDENTS

There are a number of benefits that accrue to residents of the region from a trail development over and above those that accrue to the regional economy (and therefore a select number of people) and to the wider economy (health benefits in particular).

- Medical research has shown that 1 hour of moderate exercise can add more than 1 extra hour of high-quality life to an individual.
- Cycling and walking as recreation activities can be cheaper than alternative forms of exercise such as gym classes. Yearly memberships to gyms are around \$600 in many instances – the cost of a good hybrid bike, which has a life of more than one year.

4.6.3 NON-QUANTIFIABLE BENEFITS TO THE COMMUNITY AND TO INDIVIDUALS

There are a number of unquantifiable benefits to individuals and the community. These are listed here so that a complete picture of benefits can be considered when weighed up against project costs. It is difficult to cost them for a range of reasons.

4.6.3.1 Health and Wellbeing

Rail trails are an accessible form of recreation. Trail-based recreation is generally free, self-directed and available to all people, all day, every day. Good quality, accessible trails encourage physical activity and improved health. Increasing recreational options for local communities will aid overall community wellbeing.

Physical activity has also been shown to improve mental health and help relieve stress. The economic cost of mental illness is high in Australia - estimated to be approximately \$20 billion per year. This was identified by a number of planning documents as a goal for the region (as discussed in section 3.2).

People can use trails in a variety of ways, depending on their abilities and preferences. Physical health benefits are discussed above. Social health benefits include:

- Trail activities facilitate participation and social interaction between a diversity of community members, age groups, individuals and families e.g. community walking groups, voluntary trail maintenance and conservation work;
- Market Equity (2004), in its report on trails in South Australia, found that using trails to get a sense of well-being (95% of survey respondents) and using trails as a means to unwind and relax (91% of respondents) were the two main drivers getting people out on recreation trails. The psychological health benefits of trails remain under-estimated.

- ✚ Trails can offer a wide range of opportunities to a diverse group of people. Depending upon design, trails can accommodate the elderly, people with disabilities or satisfy those seeking challenging adventures and a sense of achievement;
- ✚ Participation in trail activities has a relatively low cost to participants;
- ✚ Trails can introduce participants to other recreational and participation offerings in the community; and
- ✚ Trails help to connect people and places and to develop community pride. This has the potential to be a key non-quantifiable benefit to Ben Lomond in particular. Developing the trail may provide an incentive to re-open the general store which would have functioned as a community hub when it was opened.

4.6.3.2 Liveability

Quality recreational facilities, such as trail networks, can help create attractive places to live and visit. This was identified by a number of planning documents as a goal for the region (as discussed in section 3.2). Walking and cycling are relatively cheap modes of transport. Trails also provide a low impact means of travelling through the landscapes and play an important role in connecting people with nature.

Local users of the trail will enjoy social interaction within the community and with greater social interaction, the social capital of the area may be boosted. There are a number of benefits of enhanced social capital. It improves the capacity for people to trust others (*ABS 2012 cited in SGS 2013*). This strengthens the social cohesion in a community as it provides the opportunity for socially isolated individuals to integrate into the community. As noted above, this may be a particular benefit for Ben Lomond. Greater social capital also facilitates networking, thus creating more efficient economic networks.

Trail projects help build partnerships among private companies, landowners, and local government. Each trail contains elements of local character and regional influence, and reflects the hard work, enthusiasm, and commitment of individuals, organisations and elected officials. In addition, when residents are encouraged to become involved in a trail project, they feel more connected to the community (*Warren 1998 cited in SGS 2013*).

4.6.3.3 Education






Trails present a unique opportunity for education. People of all ages can learn more about nature, culture or history along trails. Of particular importance, trails provide firsthand experience that educate users about the importance of the natural environment and respect for nature by leading users into a natural classroom. An added advantage of a rail trail is that it provides an opportunity for city to connect to country, in a way “bush” trails do not.

Enhanced, active education along trails is achieved through the use of comprehensive trail guides and signage to encourage awareness of the natural, cultural and historical attributes of the trail.

Trails have the power to connect users to their heritage by preserving historic places and by providing access to them. They can give people a sense of place and an understanding of the enormity of past events.

4.6.3.4 Environmental and Cultural Benefits

Trails provide a number of environmental and cultural benefits. These include:

-  Opportunities for the community to experience natural and cultural environments;
-  Protection of the adjacent environments by localising impacts and facilitating management of visitation effects;
-  Educational and interpretive opportunities and increased environmental and cultural awareness and appreciation;
-  Increased community ownership which helps to preserve natural and cultural values; and
-  Opportunities for community participation in conservation and revegetation work.






4.7 SUMMARY

The New England Rail Trail will provide a number of benefits to residents and businesses of the region. Some of these are quantifiable.

If the Ben Lomond to Black Mountain trail is constructed, increased visitor numbers in the order of 9,000 visitors will inject in excess of \$1.2 million into the region's economy. Local use rates of almost 10,000 people/year will see the injection of an additional \$21,414/year. These figures represent an injection of money into the local economy, which will ensure that the construction investment and ongoing maintenance costs is "paid off" over time.

If the Armidale to Glen Innes trail is constructed, increased visitor numbers in the order of 20,000 visitors will inject in excess of \$4.4 million into the region's economy. Local use rates of almost 35,000 people/year will see the injection of an additional \$75,136/year. These figures represent an injection of money into the local economy, which will ensure that the construction investment and ongoing maintenance costs are "paid off" over time.

The proposed trail offers a range of other significant benefits to these communities that cannot be quantified but are equally important to consider when assessing the project's merits (developing the trail from Armidale to Glen Innes magnifies these benefits). These are:

-  The trail offers the opportunity for existing businesses to extend their offerings. The trail has the potential to improve the sustainability of businesses reliant on tourism.
-  The trail will encourage visitors to stay a little longer when visiting the region by offering another activity.
-  The proposed trail would build on existing trail investments and attract more users to the existing trail network, thus better realising the investment made.
-  Increasing recreational options for local communities will aid overall community wellbeing, and in the long-term reduce health costs (a saving to the State Government).
-  A trail will provide firsthand experience that educate users about the importance of the natural environment and respect for nature by leading users into a natural classroom.

In economic analysis, it is important to consider the opportunity cost of investment – the cost (foregone opportunity) of money invested in one project rather than in another. Much of the money that will be spent on this project, should it proceed, will be sourced from specific grants for tourism and/or recreation projects. It will not be available for other types of projects – there is, in a sense, limited opportunity cost for funds, though funds for this project could be spent on similar projects elsewhere with a different set of costs and benefits.

SECTION 5 – TRAIL DESIGN AND DEVELOPMENT CONSIDERATIONS

5.1 GENERAL CONSIDERATIONS

This section of the Trail Plan addresses a series of matters relating to trail design and development of the New England Rail Trail – to achieve a rail trail that is constructed with minimal disturbance to the natural environment, is sustainable and that requires minimal maintenance. It should be noted that these matters apply to both the section the subject of detailed study – Ben Lomond to Black Mountain – and the potential future development of the corridor north and south of this section (from Glen Innes to Ben Lomond, and Black Mountain to Armidale).

During construction of the original Main North line (of which this section is a part), effective drainage was important, as it is with all public infrastructure. Locating a trail on the formation of the former railway is important, and reinstatement of bridges where they have fallen into disrepair, is vital for the success of the rail trail.

Along the subject corridor there are several bridges on the rail corridor. These range in size from less than 5 metres up to 120 metres (over Beardy Waters near Stonehenge Recreation Reserve). Many of these appear to be in reasonable condition and present the opportunity to be re-used.

Construction of the railway involved the cutting and filling of the landscape to create a surface that was relatively flat to enable the passage of steam trains. The result was a series of cuttings and embankments along the entire length of the rail corridor. Effective drainage will be required, especially within most cuttings, to ensure stormwater is quickly and effectively removed from the sides of the trail (as it was when the trains were running).

Culverts and other drainage controls should be used to direct run-off away from the trail. Stormwater must drain freely, and where possible, pass beneath the trail without impact on either the base formation or the surface itself. Rail trails, by their very nature, tend to deal with these problems relatively well. Numerous culverts inspected during fieldwork were completely or partially block, thereby inhibiting the free flow of stormwater under and away from the railway embankment. Regular cleaning of blocked culverts is essential to avoid serious soil and water degradation problems.

Particular care must be given to reinstating the side (cess) drains through cuttings.



The old drains of the many cuttings along the proposed rail trail will require attention to ensure they still perform the task of clearing water from the cuttings.

Construction of the rail trail and associated signage should comply with relevant Australian Standards and Austroads guidelines. The works lists outlined in Section 6 delivers a trail to meet these requirements.

At some point in the future, (when the rail trail is funded) contractors will be engaged to remove the steel railway track and sleepers. Care will need to be taken by the contractors to ensure that the formation and bridges are left in as good a condition as possible to minimise rail trail construction difficulties.

5.2 TRAIL WIDTH AND HEIGHT

To function effectively as a shared use facility (for cyclists and walkers), the New England Rail Trail should have a width of 2.5 metres. A separate slashed bridle trail would be slashed to a width of 1 metre (if the trail is to be used by horse riders). Anything wider than that and the trail starts resembling a road, which is not what rail trail users want. The width of the existing embankment/formation of the original railway will ultimately determine the width that the proposed rail trail can be constructed in some locations.

Some sections of the former railway reserve are currently used for farming purposes (grazing etc.), and this access can be retained without seriously diminishing trail user experiences (subject to trail manager approval).

The railway has been mainly disused since 1988 (though there were some limited freight services operating to Dumaresq since that time). During this time some sections of the corridor have become overgrown and will require clearing for the passage of trail users. However, overgrown sections are very limited in number and where these do occur they are primarily caused by blackberries. It appears as if drought conditions and grazing on the corridor have significantly limited regrowth of vegetation. Where vegetation has regrown, overhead clearance should be maintained to approximately 2.4 metres from the rail trail surface. All overhanging vegetation – and that which intrudes from the sides into this ‘corridor’ should be cut back on a regular basis. Care should be taken that sharp and dangerous ‘points’ are not left in this pruning process.

There are instances where side vegetation can be retained, as the trees are attractive and provide shade. They also provide an attractive vista along the cutting or embankment.

5.3 TRAIL SURFACING

A smooth compacted surface is most appropriate for a shared-use rail trail. The surface should be firm enough to provide cyclists (the predominant user group of rail trails) with a relatively smooth ride.

Most rail trails developed in Australia use a locally available earth surface (gravel, decomposed granite, crushed limestone, etc.) to produce a firm surface easily capable of accommodating walkers and cyclists. Use of such material provides a high-quality natural surface without the expense of a hardened (i.e. sealed) surface.

Generally speaking, asphalt, concrete and other such hard surfaces are not appropriate on rail trails. However, there are some good arguments for sealing the surface of some rail trails – users on road bikes are able to use such a trail and the very successful Murray to the

Mountains Rail Trail (Victoria) is a sealed trail. Usually, the costs of putting down a hard surface and the aesthetics of a hard surface are arguments against a hard surface.

It is not appropriate to allow the trail surface to deteriorate into either a soft sandy material or a wet, boggy or slippery condition. Soft sand is not acceptable to cyclists or walkers. Water-logged trails are quickly damaged and degraded and are very unpleasant to traverse. Loose surfaces such as ball-bearing gravel are also unacceptable as they pose safety risks to all trail users (walkers, mountain bike riders, horse riders).

Landholders may wish to cross the corridor at certain localities (this is more likely to be the case along the Armidale to Black Mountain, and Ben Lomond to Glen Innes sections should they proceed) and move stock and machinery (discussed further in Section 5.12). Where these points are constructed, cement stabilisation of the rail trail surface at each 'stock crossing' is strongly recommended to ensure the regular passage of stock across the rail trail does minimal damage to the trail surface and is long-lasting.

Given the nature of the existing railway formation along the corridor, where a considerable amount of ballast remains in place in some sections, and in many other parts of the corridor numerous small stones are evident, grading will be required prior to a surface material being applied. No ballast is to be left on the trail formation. It is too rough for bike users in particular and significantly detracts from the user's experience.

Contractors engaged to remove the steel railway track and sleepers should be required to grade the formation to provide a level surface (after removal of the infrastructure). This will be a significant cost saving measure and has been factored into the trail surfacing costs. Side drains must be maintained and not filled in when grading. It is recommended that the contractors engaged to remove the steel railway tracks and sleepers be instructed to undertake their tasks with maximum care so as to leave the formation/embankment in a usable condition. Despite this care, and given the nature of the formation, some grading and re-surfacing will be required. The removal of the sleepers will leave what is often called a 'sleeper shadow' – the indentation that is left once the sleepers have been removed. Simply filling these indentations with fill will in time result in an undulating surface as the newly placed fill material settles in.

After the removal of the sleepers, a light grading of the surface is recommended. Care should be taken not to create berms of ballast on the side of the trail which have the effect of trapping the water in the trail formation i.e. creating a dam effect. Care should also be taken to ensure in cuttings that the ballast is not simply pushed in to the existing drainage measures (cess drains) on the side of the trail or these will have the effect of preventing the drains from performing as they should. Grading should be followed by the spreading and



A considerable amount of ballast still remains along the proposed trail route and must be removed in the trail construction process.

compacting (by vibrating roller) of the new surfacing material. In some locations (notably cuttings), material will need to be dug out of drainage lines in order to clear them and make them work effectively. It may be appropriate that this material be used as part of the trail surface; this approach will make every limited impact on costs but may be a way of reusing material rather than disposing of it off-site.

Alternative surface treatments may also be worth exploring. A number of liquid polymer modified bitumen composition products are currently available and the proponents have indicated that this surfacing treatment can be delivered at a similar cost to a compacted natural surface. Proponents have argued that the two key advantages are that the products re-use the ballast and therefore it does not need to be removed from site and that as a harder wearing surface it has a longer life.

Around 75% of rail trails across Australia are used by walkers and cyclists; the remaining 25% permit use by horse riders. If horses are to be permitted on this trail, it is important to keep horses off the main trail surface as the hooves of horses can do significant damage to unsealed trail – although the level of damage depends on the surfacing material used and the prevailing weather conditions. Some surfacing materials (such as “Lilydale Toppings” as used on the Lilydale Warburton Rail Trail in the Yarra Valley in Victoria) are very accommodating to horses’ hooves.

The most effective method of accommodating horses is by the establishment of a separate bridle trail – usually a signposted, slashed single-track route off to the side of the main trail (but still within the original railway reserve). This is commonly done on rail trails such as the Great Victorian Rail Trail, the High Country Rail Trail (also in Victoria) and others. The bridle trail route can be simply constructed by slashing the low grass. The constant passage of horses will keep the ‘single-track’ clear of regrowth and clearly defined. Bridle trail signage will be required to show riders where to go and to keep them off the main trail. Horses will need to share bridges where they cross watercourses.

In the costs estimates that are included within this Trail Plan (Section 6), an allowance has been made for clearing of the trail corridor (vegetation and top soil and ballast), further grading and shaping of the formation to create as smooth a surface as possible, and additional fill material. An allowance has also been included for slashing and flailing a separate horse trail.

5.4 SAFETY CONSIDERATIONS

The most significant safety issue is that of potential conflict between road users (cars and trucks) and users of the proposed rail trail – especially at road crossings. This is more fully dealt with in ‘Road Crossings’ (see Section 5.5).

Another major safety issue is that of the bridges over the watercourses. This is dealt with in detail in Section 5.8.

Possible conflicts between different types of trail users is a potential safety issue. Users in conflict can be both legal and illegal – for example, between trail users and trail bikes or 4WD’s that have illegally accessed the rail trail. Effective signage and vehicle exclusion barriers (management access gates and self-closing gates for trail user access, or chicanes)

will greatly limit this potential problem. Conversations with stakeholders indicate that trail bikes are not a major issue – at least in the Ben Lomond to Black Mountain section.

Dogs can be a potential safety consideration on this rail trail, as the corridor passes many farming properties, many of which have dogs, and numerous properties that have stock. Often, dogs can be permitted on a trail in the “town” areas limiting potential interactions with livestock. Dogs should be kept on leads and enforcement should be in accordance with relevant Council regulations.

The incidence of conflict between trail users and motor vehicles at road crossings is reduced due to there being only a few road crossings along the rail trail.

5.5 ROAD CROSSINGS

Road / trail crossings always present a special hazard which must be addressed carefully. A crossing should have enough space cleared and levelled on both sides of the road to allow cyclists travelling together to gather in a group and cross en masse. One-at-a-time crossing greatly increases the overall time in the roadway and therefore increases the likelihood of encountering a vehicle. The crossing should ideally be at a straight, level area allowing both trail user and vehicle driver good visibility and the driver ample stopping distance (if possible). All trail crossings should be perpendicular to the road.








Road crossings often present a challenge, but most of the roads across the corridor (including private access driveways) are relatively minor in nature.

The 8 road crossing concept drawings that form part of this Trail Plan (see Appendix 1) illustrate the signage that is required at each road crossing and the positioning of gates (for management access vehicles and for trail users). These concept drawings are provided for specific road crossings in the corridor between Ben Lomond and Black Mountain. They can be generalized to cover road crossings in the other two sections; however, these sections should be subject to a detailed trail development plan to allow the preparation of specific road crossing concept plans.

Signs required to create safe road crossing are outlined in Section 5.6. The rail trail should be clearly marked on each side of the road for easy recognition and the crossing be designed to move the trail user away from the road reserve as quickly as possible.

Details pertaining to shared path crossings of roads can be found in *Austrroads Guide to Road Design Part 4: Intersections and Crossings – General (Australia)*.

Generally, the road crossing treatment required includes:

-  Installation of signage on the rail trail (both sides of the road crossing) advising (or warning) of the upcoming crossing of the road. The recommended treatment is the installation of (either or both) “Give Way” (or “Stop” signs if it is a major road) and “Road Ahead” signs on both sides of the crossing;
-  “Trail Crossing Warning Signage” on the road (both sides of the trail crossing) alerting road users of the upcoming trail crossing;
-  Management access gates and chicanes (permitting access by legitimate trail users and authorised vehicles, such as emergency services vehicles and management vehicles) in certain locations. A technical drawing setting out the specifications for chicane gates can be found in Appendix 2, as well as a concept drawing and a photo of such a gate on the Lilydale Warburton Rail Trail in Victoria. Experience from other projects is that the chicane system needs to have a significant concrete surrounding as this minimises necessary maintenance mowing. The experience has been that grass can grow immediately around the timber posts and is difficult to mow using slashers. A wider concrete apron means no mowing immediately around the whole gating system. There are many alternative gating systems which could be used. Appendix 2 also includes a concept drawing of such a gate and a photo of the system in use on a recently opened section of the Brisbane Valley Rail Trail. Use of the trail by horse riders would require the addition of a horse step-over or cavaletti gate to allow horses access to the corridor if this design is used.
-  Installation of pipe culverts (where required); and
-  Miscellaneous signage (including Rail Trail name and logo; distance signs; Emergency Marker signs; road name signs; “Unauthorised Vehicles Prohibited” signs; “Trail Bikes Prohibited” signs, etc.).

5.6 SIGNAGE

Several kinds of signage are required on the New England Rail Trail, including distance, directional, warning, promotional, etiquette and interpretive signs. Each should be standardised along the rail trail and, where appropriate, concordant with relevant local or Australian ‘standards’ or practices. The chosen colours of all signs should be uniform throughout the trail.

Themes and styles already established for other rail trails in Australia, and in keeping with the uniformity in signage sought by Railtrails Australia, may dictate what style of signs and marker posts are used along this rail trail. Trail markers and signage on other rail trails are sometimes affixed to old (recycled) railway sleepers or recycled plastic posts.

In the case of the New England Rail Trail, given the large number of railway sleepers to be removed from the line when it is removed, one approach may be to pick the best of the available timber sleepers and re-cycle them as signage.

5.6.1 DISTANCE SIGNAGE

Recognising that users will join a rail trail at any number of points, installing distance and direction signs at road crossings will not only benefit those joining the rail trail at that location, but provide additional information for users already on the rail trail. Given the urban nature of the trail, the plate should indicate the distance to the upcoming road crossings along the rail trail.

Trail distance signage will need to be placed at regular intervals along the route. The obvious location is at each road crossing (and at the trailhead) where trail users are likely to join the trail. It is proposed to implement standard signage addressing distance requirements every 1 km.

The recommended distance sign plates (as with all other signs) should be affixed with at least 4 stainless security screws to prevent them being removed. In addition, the distance signs (as well as the various other sign panels used on the posts) should be affixed with silastic or 'liquid nail' products

5.6.2 WARNING SIGNAGE

There are a number of locations along the proposed New England Rail Trail that demand warning signage, primarily at the many road crossings facing trail users. In the case of road crossings, (either or both) a "Road Ahead" yellow diamond warning sign (W6-8A) some 50-70 metres before a crossing is recommended (on a stand-alone post), with a triangular "Give Way" sign (R1-2) on the verge at the road crossing (on a stand-alone post) – or a "Stop" sign where appropriate (R1-1 – 300 x 300). Bicycle/pedestrian (i.e. Trail Crossing) warning signs (W6-9) with arrow (W8-23) (or W6-V105) are recommended for installation on roads, either side of a trail crossing, or use of "Crossing Ahead" signs as indicated above.



Above: Signage for the Tiger Rail Trail in Victoria warns of the upcoming road crossing as well as promoting its existence to all road users passing by.

The proposed rail trail has 8 road crossings along the route, and some of these provide both challenges and opportunities for trail development. The challenges come in ensuring that these crossings are safe for future trail users, while the opportunities surround the passing road users who can be alerted to the trail's presence. Such 'opportunistic' promotion can only be good for the future of the rail trail in raising awareness and increasing user numbers.

5.6.3 PROMOTIONAL SIGNAGE

Promotional signage has been used to great effect on other rail trails throughout Australia, increasing general awareness of the trail among the broader community. For the proposed New England Rail Trail, the recommended 'promotional' sign should be incorporated into the on-road 'Crossing Ahead' warning signs (such as has occurred on the Forrest Birregurra Tiger Rail Trail). They are an excellent means of communicating the message to road users that they need to be alert for the presence of trail users.

Though the railway corridor may be quite likely familiar to many local residents, it is recommended that a number of "Trailhead" signs also be erected to give prominence to the trail when constructed. The installation of these signs will enable local people and visitors become more aware of the trail (a good example is the High Country Rail Trail).



Signs pointing in to the "Trailhead", as used on the High Country Rail Trail in Victoria, are an excellent means of directing trail users to a Trailhead and serve to promote the existence of the rail trail to passing motorists, tourists and local people.

5.6.4 EMERGENCY MANAGEMENT SIGNAGE

Distance signage provides good reference points for emergency services. It gives anyone who needs emergency assistance an easy reference point. On other projects, consultation with ambulance officers in particular highlighted this need. When people panic (as they often do in an emergency situation), normal cognitive processes do not work. On-trail signage should be as helpful as possible and minimise likely stress. Consequently, distance signs should be installed at regular intervals, with distances to the next trailhead or major town or road crossing (on either side of the post). This enables people to quickly identify where they are by travelling a very short distance from the emergency situation. All road crossings should also have a GPS reference/identifier on the chicane (or on a separate post) for use in emergencies, again as a location aid for those in stress. There is also a need to include the emergency telephone number at all trailheads (on the trailhead map panel) and clearly identify that one number will contact all three emergency services (police, ambulance, fire). While the emergency number from a landline is 000, the emergency number that works best from a mobile phone is 112. Information on what to do in an emergency, the location of public phones (there may be none on the trail itself), and the capacity for a flip-down sign indicating trail closure (due primarily to fire, flooding or maintenance work) should also be included at each trailhead.



Above left: An Emergency Marker sign on the Lilydale Warburton Rail Trail in Victoria. Above right: An Emergency Marker on the Kilkivan Kingaroy Rail Trail in Queensland.

It is strongly recommended that “Emergency Markers” be installed along the New England Rail Trail. The works tables (Section 6) have included these markers within the trail distance signage as has been done on the Kilkivan Kingaroy Rail Trail in Queensland and the Lilydale Warburton Rail Trail in Victoria.

In summary, the emergency signage that should be erected on a trail consists of:

- ✚ Distance signs at regular intervals showing distances to next trailhead or town or road crossing (double-sided). It is recommended that these include emergency marker signs (with a series of unique codes or identifiers);
- ✚ GPS identifiers at all road crossings (attached to the sign posts or gating systems); and
- ✚ Trailhead signage specifying what to do in an emergency, the numbers to call, the location of public phones, and the capacity for a flip-down sign indicating trail closure (due primarily to fire, flooding or maintenance work).

5.6.5 PERMITTED USER SIGNAGE

Signs (in the form of pictograms) indicating user groups that are permitted (or not permitted) on the various sections of the New England Rail Trail should be installed at every road crossing and entry point. These small signs can easily be installed on the totem posts near to the proposed trail user access gates (chicanes) or even on the gates/chicanes themselves. Pictogram signage could include “No Motor Vehicles”, “No Motor Bikes”, “No Smoking”, “No Alcohol” and “Dogs on Lead”. The installation of “No Motor Vehicles” and “No Motor Bikes” are recommended at the outset, and the trail manager will ultimately determine what other signage may be required.

5.6.6 INTERPRETIVE SIGNAGE

On-trail interpretation is becoming more and more of a feature of trails built in recent times. When well done, it can add significantly to the depth of the user's experience. It can also generate a sizeable cost and can be subject to ongoing vandalism in urban and rural areas.

All rail corridors are inevitably rich with history, not just European settlement history but also indigenous and natural history. The New England Rail Trail corridor is no different. People will move along this trail at a leisurely pace. This slower rate of travel, a more relaxed frame of mind and openness to new experiences provide ideal circumstances to educate trail users on all aspects of the country through which they pass. There are many stories that can be told along rail trails. The provision of interpretive material will greatly enrich the experience of visitors to the rail trail.

Effective interpretive material gives a specific "flavour" of the events, landforms, wildlife, and vegetation relevant to a specific site. The intention is for the traveller to develop a deeper understanding of the multitude of stories contained in a region. Conversely, the themes can be designed to spark interest, encouraging people to explore any story that interests them. It may also encourage them to extend their stay in the region to further pursue an interesting story or theme.

Interpretive signage does not need to be in place from the trail opening (though this would be a commendable outcome) but at least some information should be embodied in the trail brochure. Interpretation should be an integral part of any trail's development process.

The works tables (Section 6) make allowance for the placement of a number of panels along the rail trail, as well as identifying specific locations for placement of interpretive signage.

5.7 EROSION CONTROL

Proper drainage is of considerable importance in constructing a lasting, maintenance-free trail. Water should be removed from trail surfaces as fast as possible, wherever possible. Given the flat terrain or gentle slopes involved on much of the proposed rail trail, erosion control should be relatively easy. As the railway has not operated for many years, maintenance of the formation and its drainage structures has been non-existent. Consequently, many of the culverts under the formation and drains along the formation have become overgrown with weeds, grasses and other vegetation. Most require cleaning out.

Those sections of the railway formation which do have blocked culverts or dysfunctional drains should be attended to in the trail construction process, as allowing water to stand on the proposed trail surface or run down even a gentle slope is to invite surface damage followed by costly repairs.

It may be necessary to clear existing drains on a regular basis, or to install additional culverts under the trail in some locations to remove standing water effectively – if this is done, care must be taken to ensure the surface is soundly patched afterwards.

While the cuttings appear to be in good condition, it may be necessary to build up the trail within the cuttings to ensure the cess (or side) drains operate effectively. It may be more effective to "build up" the trail formation to 300mm (rather than 150mm) rather than



excavating the cess drains in cuttings – while this can be determined at the time of construction, the works tables (Section 6) identify specific locations where this is the appropriate course of action.

5.8 BRIDGES

Bridges are one of the most obvious reminders of the heritage value of disused railways. They are also one of the most significant attractions of trails along disused railways and one of the costliest items in the development of trails on former railways.

5.8.1 THE ORIGINAL BRIDGES

The corridor between Ben Lomond and Black Mountain has a 5 relatively small bridges (ranging in size from 5 metres to 12 metres). While the corridor sections between Glen Innes and Ben Lomond, and between Black Mountain and Armidale were not traversed in detail, it is known that there are:

-  17 bridges between Glen Innes and Ben Lomond, ranging in size from 4 metres to 120 metres. Included in this list are three substantial bridges over Beardy Waters (120 metres), Marowan Creek (62 metres), and Williams Creek (28 metres).
-  4 bridges between Black Mountain and Armidale (2 bridges are approximately 4 metres long, while 2 are approximately 15 metres long). Included in this list is the viaduct over McLennan Street in Armidale which Armidale Regional Council has recently passed a resolution asking for it to be removed.

Whilst all the bridges have timber “topping” (sleepers, corbels), the construction of the lower sections varies. The majority of girders (the long single piece structures that span the length of the bridge) are timber though some are steel I-beams or brick arch. Abutments (the material used in stabilising the edge of the formation) are made either of timber, brick or concrete. The trestles are either directly anchored in the ground or in concrete footings.

The works list recommends the retention of 4 of the 5 bridges in the Ben Lomond to Black Mountain section (as indicated in the works lists in Section 6). The bridges should be retained on the assumption that they are structurally sound pending a structural engineering assessment to confirm their capability to carry trail users. It is worth noting that railway bridges were constructed to hold heavy locomotives – and that, provided the bridge structure is sound, weight is not a significant factor when considering the re-use of rail bridges for walkers and cyclists. It is unlikely that construction vehicles will have to use these bridges (due to the nature of the corridor and its ease of accessibility from adjoining roads), and this should be avoided. Horses (if they are to be permitted on this rail trail) will need to share the bridges with other rail trail users.

There are disadvantages associated with not using the remaining bridges. Not using the bridges means the loss of an essential part of the rail trail experience. There is a strong case for retention of bridges for their heritage and convenience / utility value. Riding down a steep benched switchback or wheeling a bike down a set of steps to cross a creek then up an equally steep climb on the other side presents at least some trail users with daunting technical and physical challenges and necessitates careful design, construction and maintenance of gully / watercourse approaches to provide for safety and prevent erosion.

Retention of the bridges also retains the positive experience of riding along the top of old bridges with panoramic views of the surrounding landscape and the watercourse below. The rail bridges were originally built in their locations primarily because railways need very gentle grades or slopes and the same principle applies to re-use of railway formations as recreation trails. Bridges also provide a safe crossing when water is flowing in gullies, creeks and rivers.



Above: A low level timber bridge across a creek on the Kingaroy Kilkivan Rail Trail.



Above: A concrete floodway across a creek on the Kingaroy Kilkivan Rail Trail.



Above: A flooded waterway crossing on the Kingaroy Kilkivan Rail Trail.

Various options are available for waterway crossings, where the original bridge no longer exists. However, leaving a waterway crossing in a natural state (see photo at left) can lead to issues with trail useability.

Engineering certification of bridge supporting structures and abutments is strongly recommended, to ensure the structural soundness of the bridges to be re-used. The services of a qualified bridge engineer will need to be utilised to assess both bridges for structural soundness (a Level 2 integrity test is sufficient), to provide drawings of, and specifications for, a typical bridge super-structure and re-decking.

5.8.2 BRIDGE DESIGN FOR RAIL TRAIL USE

Reinstatement and refurbishment of the bridges (notably re-decking and installing handrails in compliance with Australian Standards for bridges) will be a major component of the cost of establishing the New England Rail Trail.

To ensure re-use of the timber trestle bridges (along the entire corridor from Glen Innes to Armidale), it is critical that the steel rails and sleepers be retained to provide structural integrity to the bridge (by cutting the steel track several metres away from the bridge abutment at both ends). The sleepers and steel track will help tie the entire structure together, thereby resulting in a more rigid, stronger and longer lasting structure. With the sleepers left in place, timber bearers are fixed to them to provide a 'clean' surface to attach decking and handrails. Decking should be attached perpendicular to the direction of travel (an alternative attachment is at 45 degrees to the bearers – the attachment recommended by the Rails to Trails Conservancy). Decking timbers should never be fixed parallel to the direction of travel.

On the Brisbane Valley Rail Trail, the project manager was able to re-use a significant timber bridge over Jimmy's Gully at Harlin (see photo). The advice from the Project Manager was that the original timber bridge was in very poor condition. The superstructure (girders) were completely decayed with no useable timber. However, once the bad timber was cut away near the headstock connection, the substructure (piles) was in pretty good shape. To get a good engineering and affordable outcome, the bridge was shortened and reduced in height. The refurbished bridge was the cheapest option and a very nice feature on the rail trail as well as keeping the heritage significance with the reuse of the timber piles. The bridge is engineering certified to carry pedestrian loads (including horses) with a 75-year design life.

The cost of this work was around \$11,000/lineal metre (note that the works tables in Section 6 generally have used a cost of \$6,000/lineal metre as it is assumed that decking and handrailing only is needed). The reason for including this advice is that a bridge such as the one over Beardy Waters, though appearing daunting, can be re-used at a comparatively low cost (\$11,000/lineal metre) while providing a high-quality rail trail experience.

In considering bridge re-use, the use by emergency vehicles and maintenance vehicles also needs to be considered. However, the bridges in the Ben Lomond to Black Mountain do not need to carry emergency vehicles given that the sections are not "isolated" i.e. road access is relatively simple. That is, emergency vehicles can get onto the trail very easily either side of any of the bridges. The situation may be more challenging when considering the extension of the rail trail north to Glen Innes or south to Armidale.

In these circumstances, the Rails to Trails Conservancy recommends that, as a general rule, multipurpose trail bridges should support a minimum design load of 5.67 tonnes (the RTC is an American organisation and consequently recommends the imperial measurement of 6.25 tons).



Above: Jimmy's Gully Bridge on the Brisbane Valley Rail Trail uses a combination of old (existing) and new timbers.

Notes for all bridges

Handrails will be required where the fall from the bridge decking to the ground is greater than 1 metre. This is a Standards Australia requirement. Handrails will help ensure the safety of users of the bridges, preventing people from falling over the sides and giving a sense of safety, uniformity and consistency along the trail. Timber handrails are best, providing a more aesthetic finish and are more in keeping with rail trail heritage values (although pre-fabricated bridges are unlikely to have timber handrails). One design option is to use galvanised chain link mesh (50mm diamond mesh) with support bracing to prevent children climbing through.

In dealing with bridge design, the Council will need to consider use by horses. None of the bridges in the Ben Lomond to Black Mountain section are very high and should not concern horse riders. Other bridges (such as the one over Beardy Waters) are higher and may present concerns for horse riders. Concerns are sometimes raised about leading horses over high bridges. If horse riders want to use the entire trail (if it is constructed from Glen Innes to Armidale), they will need to be confident that their horses can be lead over these high bridges. If the users are not confident of their horses over such a height, they should not use sections of the rail trail where there are high bridges. If a trail is developed along the longer corridor, information should be included in trail literature, notifying users of the bridge height. On the corridor, a 'Dismount and Walk' policy on bridges should be implemented, with signage directing horse riders to dismount. This is recommended to guard against riders being thrown off horses on structures likely to be intimidating to horses (and young and novice riders). This policy should prove quite adequate to manage what is statistically likely to be a relatively small number of potentially dangerous situations. If horse riders want to use the trail, they will need to be confident that their horses can be lead over any bridges.

There are designated standards for handrails for pedestrians and cyclists (1.0 – 1.1m high for walkers and 1.3m for cyclists with a number of detailed specifications regarding design). There are no standards for horses, although the UK has adopted a height of 1.8m where fall to ground is significant.

5.8.3 PRE-FABRICATED BRIDGES

There is one location along the corridor between Ben Lomond and Black Mountain where a small timber bridge is in place but has fallen into significant disrepair. From preliminary assessments, the three bridges between Armidale and Black Mountain (excluding the viaduct at McLennan Street) are in good condition. The bridges between Glen Innes and Ben Lomond are in mixed condition with at least three in poor condition. A simple option where bridges are in poor condition is to install pre-fabricated bridges. Landmark is one company that specialises in supplying such bridges but there are other suppliers.

Any replacement bridges needed between Ben Lomond and Black Mountain (the works list recommends only one) are unlikely to need to carry vehicles. There is sufficient “go-round” space to allow vehicles access along the trail elsewhere within the former railway corridor. This may not be the case in other potential trail sections; a detailed trail development plan would assess these requirements.

In considering replacing timber bridges, an alternative is to recycle some of the salvaged timber and utilising appropriately skilled community members to construct some

replacement bridges out of the recycled timber, thus reducing the requirement for pre-fabricated bridges. This may save some costs, though this approach will not be cost-free.

The recycled timber could also be used elsewhere on the rail trail for seating, shelters, gates, fencing, etc.

5.9 TRAIL FURNITURE

There are a number of scenic locations along the corridor well suited to the placement of seats that would benefit all trail users. An allowance has been made for the eventual installation of seats – at sites selected by the trail manager. Sites should have views over the adjoining countryside. Care should be taken in the selection of styles of seating and tables. Many styles commonly used on trails are more suited to backyard gardens, or city parks. Few look ‘right’ in the natural environment.

Placement of simply constructed seats at intervals along the trail will benefit all trail users.

5.10 TRAILHEADS AND PARKING

A trailhead is usually defined by the existence of a car parking area, often with picnic facilities, interpretive signage, a map panel of the trail showing sites of interest and distances to features along the trail and a Code of Conduct. It is a location where a (short or long) trail walk or ride can begin or end. Given that much of the usage of the New England Rail Trail is likely to come from users from other areas, formal ‘trailheads’ are important.

3 trailhead locations have been selected for the Black Mountain to Ben Lomond Trail:

- ✚ the station ground at Ben Lomond station;
- ✚ New England Highway Park, Guyra; and
- ✚ the station ground at Black Mountain station.

Basic facilities such as parking, and a picnic table or seats in the shade, interpretive information (on a map panel) showing distances to features and towns along the rail trail is important and will prove useful to all rail trail users (the proposed Guyra trailhead already has most of these facilities given it is in an established park).

Concept plans for the 3 trailheads are included in Appendix 3 of this Trail Plan.



A typical trailhead interpretive shelter. Usually these shelters may contain two information panels (front and back, with general information, a map with the trail route and key features and important safety information for trail users.

5.11 FENCING

Fencing along a rail trail is required for several reasons:

- ✚ To prevent unauthorised access onto the rail trail;
- ✚ To prevent authorised trail users (cyclists, walkers, horse riders) from attaining access onto adjoining properties, and to prevent unauthorised trail users (trail bikes, etc.) from illegally trespassing onto private property;
- ✚ To minimise disturbance of stock by trail users;
- ✚ To prevent encroachments by adjoining landowners;
- ✚ To delineate freehold (private property) from Crown land and to minimise encroachments and trespassing, unintended or otherwise;
- ✚ To prevent stock from straying (recognising that it is the land owner's responsibility to ensure stock does not stray); and
- ✚ To keep stock off the rail trail and away from trail users.

Given that much of the corridor between Ben Lomond and Black Mountain has a road as one "neighbour", the existing boundary fencing along the corridor remains in very good condition. Some sections particularly north of Guyra running into Guyra are unfenced as they are part of the park system. It is critical that the rail trail corridor be fenced on both sides of the trail where it passes through farms – for public liability insurance and risk reasons. The rail trail corridor cannot remain unfenced. The existing boundary fencing is sufficient to address these concerns.

There is limited need for new boundary fencing. However, there has been discussion about the best way to maintain the corridor as maintenance costs are one of the major concerns of the Armidale Regional Council. One of the options to maintain the corridor (as oppose to maintaining the actual trail) is to allow adjoining or adjacent landholders grazing permits over those parts of the corridor not required for a trail (a 6 metre envelope incorporating the trail on the railway formation). As the original railway corridor is mostly 30 – 60 metres wide, the excess corridor can be leased to adjoining landowners. This approach will minimise the reduction in land that they currently farm and enable stock to 'maintain' the corridor outside of the fenced trail corridor (noting that some landholders already have stock on the corridor – this factor and the drought have kept regrowth to a minimum).

There are three options for corridor maintenance that will impact significantly on fencing requirements:

- ✚ Option 1 requires the erection of new fences along the entire corridor so that there is a 6 metre trail corridor along the entire route (except through the town section of Guyra). Adjoining landholders are offered the opportunity to graze the "excess" corridor. Interest needs to be sought before this major cost exercise is undertaken and interest may not be as great given that adjoining landholders will need to move stock onto the corridor in many places where trail is bounded by roads on both sides. Use of permanent fencing to facilitate grazing the "remnant" corridor will involve installing new fencing closer in to the trail (rather than at the property boundary). This ensures ongoing grazing access to the "remnant" corridor, even if land ownership changes.

This option will involve a high capital cost. The recommended fencing alignment will follow the edge/top of any embankments (at the edge of the railway formation) and along the top of any cuttings.

The works tables in Section 6 have been prepared utilising this as the preferred option. Under this option, fencing accounts for some 13% of construction costs along the corridor. This option provides for low maintenance costs in terms of reduced slashing requirements (though human resources will be required to manage this process within Council). This is the option that is costed within the works tables in Section 6 and the option considered when calculating maintenance costs (Section 9). Under the maintenance costings, the only slashing costed is the 6 metre corridor width.

If this option is pursued, the installation of the fencing should be undertaken in close consultation with the adjoining landowners who wish to graze the corridor.

- ✚ Option 2 would allow stock to graze the “remnant” parts of the corridor at given times of the year to manage vegetation growth. The best approach to temporary seasonal grazing may be to allow grazing by the use of temporary electric fencing delineating the grazing areas. This is a low-cost solution and the payment for electric fencing can be negotiated between the landowner and the relevant council. Livestock could be permitted on the corridor at certain times of the year for a limited period of time. Under this management scenario, stock should be moved off the corridor on weekends (this is anticipated to be the highest use time). This approach reduces the opportunities for negative interactions between stock and trail users (though none are anticipated). The grazing opportunity is offered to adjoining/nearby landholders as needed. This approach needs the trail manager to actively seek and manage temporary licences. This option offers a low capital cost, and relatively low maintenance cost (falling between Option 1 and Option 3). This option has not been included in any cost calculations (either capital or maintenance).
- ✚ Option 3 is basically a ‘do nothing’ option. No new fencing would be erected (none is needed). The trail manager would manage the entire corridor width, slashing up to 5 - 6 times/year depending on growing seasons. This has effectively no capital cost but a very high maintenance cost. It also means that no stock would be permitted on the corridor due to public safety and public liability concerns. Again, this option has not been included in any cost calculations (either capital or maintenance).

5.12 STOCK CROSSINGS

Primarily due to the nature of the corridor between Ben Lomond and Black Mountain, there were few ‘private’ level crossings encountered – these crossings allow adjoining landowners can move their stock or machinery from one side of the rail trail corridor to the other. It is likely that there will be more such crossings of the corridor north of Ben Lomond and south of Black Mountain due to the nature of the landscape through which the corridor travels. The following information is provided for future reference should development of other trail sections proceed (there may be examples in the Ben Lomond to Black Mountain section where this advice is relevant – only one was encountered and that was not far north of Guyra).

Any such crossings should be retained, and the development of any trail will need to make allowance for their retention. These facilities are only required where landholders own parcels on both sides of the corridor. They may also be needed where an adjoining landholder expresses an interest in grazing the “remnant” corridor as discussed in 5.11 above.

Such crossings can be either ‘open’ meaning that stock are able to cross the rail trail to the other side of the corridor at all times, unhindered by gates – with trail users having to open gates to get across the stock crossing, or they can be gated either side of the corridor meaning that the adjoining landowners would be responsible for opening the gates when needed.



Stock grids along rail trails, such as this one on the rail trail south of Margaret River in WA, can allow stock crossings to be open 24/7 thereby enabling stock and machinery to cross the trail unimpeded.

By having ‘open’ stock crossings, the matter of stock being cut off from water supplies on the other side of the fenced corridor is negated. In this scenario, trail users will need to open self-closing gates at each side of the crossing and pass across from one side to the other. The gates need to be 1200mm spring-loaded gates opening into the crossing in order to prevent stock pushing them open. Gate design needs to ensure that the gate closes against the adjoining fence post (i.e. the opening for the gate is to be less than 1200mm). While not favoured by rail trail users as this is somewhat inconvenient (especially when there are many gates to open/close) it is regarded as one of the best compromise designs. By allowing stock from adjoining farms to cross from one side of the corridor to the other at all times, the interruption to current farming practices is minimised and adjoining landowners are much more favourably disposed to the prospect of the rail trail.

Individual discussions with landholders at the time of construction would work out the most appropriate system. Another alternative is to use stock grids either side of the crossing that trail users must pass over. This does away with the need for gates to be opened (and closed) by trail users. Care must be taken in the design and fabrication of the grids to ensure they are safe for trail users, particularly cyclists. If horse riders are to be permitted on the corridor, this solution does not work without the installation of cavaletti gates in the adjoining fence (which may allow stock to wander) (See photo above for a typical example of a grid on a rail trail).

As noted in Section 5.3, cement stabilisation of the rail trail surface at each ‘stock crossing’ is strongly recommended to ensure the regular passage of stock across the rail trail does minimal damage to the trail surface and is long-lasting.



Above and below: two styles of stock crossings on the Otago Central Rail Trail in New Zealand.





There are several options for moving stock across a rail trail. Top: crossings that are gated either side of the corridor allow the controlled passage of stock and/or machinery at certain times. Bottom: crossings where gates are across the rail trail, where trail users need to open/close the gate.

5.13 ENCROACHMENTS IN THE TRAIL CORRIDOR

Between the closure of the railway in 1988 and the present, several encroachments on to the former railway corridor have been made. Grazing of livestock occurs in several locations. Cross fences abound – their purpose is no longer clear. There is a set of loading yards that have been built on the corridor between Ben Lomond and Llangothlin. This is not a major issue. The yards do not need to be removed and signage detailed in Section 6 identifies how to deal with this infrastructure.

5.14 USE OF THE RAIL CORRIDOR BY COMMUNITY GROUPS

The most significant issue on the corridor is the use of the corridor between Guyra Station and Ollera Street in Guyra by operators of the railway heritage machinery. It is understood that the operator runs various operations at the time of the Lamb and Potato Festival and on other occasions. Running an operation such as this requires use of the intact railway line making the provision of a rail trail through this area a little more difficult.

The works tables (Section 6) provide two alternative routes for the trail from Ollera Street to the southern extent of the station ground (approximately 1 kilometre south of where the railway line crosses Sandon Street) to avoid interfering with these operations. The tables, road crossing drawing and the maps provide a clear explanation of these options. It should be noted that providing alternative routes (rather than using the rail corridor through Guyra) will add in the order of \$250,000 to \$260,000 to the trail construction costs.

Taking the trail off the corridor in this location to facilitate an ongoing and respected community use should provide no major issues. However, the NSW Government has indicated in public workshops for rail trail proposals that there is no intention to sell off any sections of disused railway line once the railway line is closed (if a proposal proceeds that far). It is highly unlikely that the Government would countenance any form of land swap that would remove sections of the rail corridor from public ownership. Use by any community group is not considered such an issue. Re-routing the trail in other locations to avoid private land is not a viable option (this issue may be raised if the trail proceeds either north to Glen Innes or south to Armidale). In addition to the NSW Government's position, taking the trail off the railway formation and corridor has the potential to detract from the experience. Rail trails have a historical element to them involving travelling along the old railway formation, embankment or cutting. They also provide a safe off-road cycle and walk experience - hence their appeal. It is acknowledged that while the "historical" appeal is somewhat reduced in an urban environment, as this is, it does nonetheless have that appeal.

5.15 OTHER USERS AND TRAIL ETIQUETTE

Managing interaction between user groups is a primary prerequisite on all trails, and standard signage and protocols already exist. Providing adequate signage is installed and users are well aware of the likelihood of meeting other user groups, such interactions should generally be non-threatening and relatively safe.

Every attempt must be made to ensure the rail trail is not used by either four-wheel drives or trail bikes, though this is likely to be difficult to manage and hard to police. The proposed management access gates and chicanes at every road crossing will go part way to addressing this issue.

Education through signage and use of gates or other vehicle exclusion barriers will help, as will encouraging bona-fide users – and local residents – to report registration numbers of illegal users.

The works tables (Section 6) provide guidance on how to manage trail users when the railway heritage machinery is operating along the preserved rail line around the Guyra Station.



The Murray to the Mountains Rail Trail has a Code of Conduct sign board at regular intervals along the trail ensuring that all trail users are aware of their rights and responsibilities.

5.16 CODES OF CONDUCT

A Code of Conduct for each user group provides all trail users with guidelines to minimise their impact on the environment, and on other trail users.

Codes of Conduct help to:

- ✚ Prevent trespass; ✚
- ✚ Prevent soil erosion; ✚
- ✚ Minimise trampling;
- ✚ Prevent the introduction and spread of noxious and exotic plants;
- ✚ Protect waterways;
- ✚ Reduce the risk of fire;
- ✚ Protect significant and environmentally sensitive sites;
- ✚ Minimise potential conflict with other users of the trail; and
- ✚ Ensure the safety of all trail users.

Trailhead signage is the best place to provide Code of Conduct signage.

5.17 HERITAGE ISSUES

A number of structures along the trail corridor have historical or heritage value. These include station buildings, station signs, bridges, culverts, cuttings and embankments, and distance posts. A rail trail will enhance the appreciation of these historic assets.

It is strongly recommended that the trail manager seek to ensure all artefacts and relics of the railway remain in place during the construction of the trail. The existing stations and

other buildings in all the station grounds are outstanding examples of preserved railway heritage.

All existing signs, signals and switches have been identified in the works tables and an allowance made for the retention and upgrading.

5.18 ENVIRONMENTAL ISSUES

A number of key environmental issues have been identified. These include:

- ✚ Clearing of regrowth vegetation along the corridor, and the need for clearing permits and the possible future need for offset re-vegetation. This may not be a major issue given the current state of the corridor.
- ✚ The potential for the spread of weeds (and pathogens) during the construction phase and, potentially, through usage of the trail.
- ✚ Contamination of soils as a result of the operations of the railway and the manner in which former bridges were constructed and maintained.
- ✚ The potential for sedimentation of watercourses as a result of trail construction and bridge works.

In addition, care will need to be taken in the ongoing maintenance of the proposed rail trail to ensure weeds and pathogens are not unwittingly spread by maintenance machinery. Ongoing clearing at the sides of the rail trail will be required to keep the trail corridor at acceptable widths.

5.19 CLEARING FOR THE RAIL TRAIL

In the years since the railway last operated, vegetation (in various forms) has regrown along parts of the corridor that formerly was kept clear of vegetation. The amount of regrowth vegetation varies along the corridor but is quite minimal. It is mostly confined to blackberries and the odd fallen tree.

The estimates of probable costs reflect these various types of clearing of vegetation.

Generally speaking, a cleared 'trail corridor' of 3.5 - 4.0 metres will be required to enable a trail of 2.5 metres to be developed in the centre of the cleared corridor. Either side of this trail will be further clearing of vegetation up to 1.0m for drainage.



Clearing will be required at a number of locations along the former railway corridor.

Ongoing maintenance will be required, on an 'as and when required' basis, to prune the vegetation alongside the trail to keep the trail corridor clear of overhanging vegetation. The regularity of the clearing of side growth vegetation will depend on numerous factors, particularly the type of vegetation growing alongside the trail over its length.

5.20 TOILETS

Proposed trailheads at Ben Lomond Station, Guyra and Black Mountain have existing toilets. It is assumed these are still functioning. There are also accessible toilets at Llangothlin. Consideration has been given to the installation of additional toilets along the rail trail but it is felt unnecessary given the relatively short distances between the existing facilities and the high cost of new toilets. There is no standard accepted distance between toilets on a trail.

SECTION 6 - WORKS LIST AND PROBABLE COSTS

6.1 INTRODUCTION

Investigations undertaken during the fieldwork associated with this project enable a reasonably accurate picture of the work required to bring about the development of a rail trail within the disused railway corridor between Ben Lomond and Black Mountain.

The project has not included detailed investigations of the corridor between Armidale and Black Mountain, and between Ben Lomond and Glen Innes. Some fieldwork was carried out looking at parts of this corridor that were accessible or viewable from public roads. Mapping was also used to determine locations and probable sizes of bridges in particular (many of the longer bridges were inspected as part of fieldwork).

6.2 LANDHOLDER CONSULTATION



The study brief does not include any formal community consultation in this project.

There will be a range of issues raised by adjoining landholders. Many of these were raised in the consultation conducted by the Department of Premier and Cabinet. Many of these issues and solutions have been covered by the endorsed NSW Government position as laid out in the *Strategic Risk Assessment – Biosecurity Risks Associated with Rail Trails*.


In response to possible questions, this report includes a number of specific solutions that are recommended to address issues that are likely to arise. There is also a generic allowance in the tables for each section of the rail trail for other items that may be requested by landholders in the future. An allowance has also been included for consulting with adjoining landholders and discussing individual issues and addressing concerns and agreeing to solutions (to comply with the NSW Government's position).

6.3 SECTION COSTS

For the purposes of determining costs, the per unit construction rates set out below have been used:


-  Trail construction. Construction includes stripping of top soil, boxing out, cleaning side drains, compacting subgrade (to 150mm), filling with roadbase, levelling, trimming, shaping and compacting: \$60/lineal metre (for 2.5m trail width). Assumes formation is clean and reasonably level (subsequent to steel track and sleeper removal).
-  Clearing. Clearing costs (prior to earthworks) vary:
 - Slashing or side pruning (no heavier clearing will be required along much of the corridor). The cost varies from \$1,000/km for slashing of cleared trail route (prior to earthworks), to side pruning at \$2,000/km (i.e. track may exist but needs to be widened). An average cost of \$1,500/km has been included. (The slashing costs for construction purposes are much higher than ongoing slashing covered in Section 9 as the initial slashing for construction will be a much more complicated operation).

- Minor clearing is \$3,000/km;
- Moderate clearing (most notably the removal of small trees in the formation) is \$6,800/km; and
- Heavy clearing (large trees and/or significant undergrowth in the formation) is \$14,000/km.

 An option for slashing and flailing a separate bridle trail has been included within the works/costs tables. This is the preferred option if horse riders are to be allowed to use the rail trail. The works tables provide for slashing a parallel bridle trail from Ben Lomond Station to the northern side of Guyra (approximately 700 metres north of Ollera Street) and from the southern side of Guyra Station to Black Mountain Station.


Bridge Costs


- Installing pre-fabricated bridges (Landmark or similar) - \$4,000/lineal metre. Handrails will be required (except where specified) as fall to the ground exceeds 1m.
- \$6,000/lineal metre for re-decking and erecting handrails on existing timber bridges (where the bridge is sound). It should be noted that, in the instances where bridges are to be maintained, it is assumed that they are sound (based on visual inspections in August 2018). Detailed engineering inspections are needed to confirm this is the case. This should occur as part of the construction management process.


 Purchase and installation of "Trailhead" sign pointing in to trailhead from road(s) - \$1,600/unit.


 Purchase and installation of "Trailhead" map panels at trailhead - \$5,500/unit.


 Purchase and installation of "Trail crossing" signs on roads - \$600/sign.


 Purchase and installation of Trail Directional Markers (incorporating emergency markers) - \$600/unit installed.


 Purchase and installation of signage for road crossings (i.e. "No Trail Bikes", Road Ahead, Stop/Give Way, road name, trail name/logo etc.) – cost varies depending on complexity of road crossing, traffic volumes, extent of barrier fencing and gating etc. - \$600/crossing (general allowance).

 Chicane gate and management access gate (primarily at road crossings) - \$2,700/set with additional \$200/'panel' if required (additional width of timber fencing either side of gate and chicane).

 Stock and machinery crossing point - \$3,800 ea. (includes management access gates and self-closing trail user gates on both sides of crossing).




 Farm access gate/management access gate (installed in new or existing fence) - \$1,000/unit.

 Removal of fences across corridor - \$200.

 **Fencing - \$15/metre installed. It is proposed to provide a trail corridor of 6 metres wide (with the formation in the middle forming the basis of the trail) along the entire length of the rail corridor. This allows the remaining corridor beyond the 6 metre "envelope" to be grazed by adjoining or other landholders thus reducing the maintenance costs. This adds to the construction costs but significantly reduces the maintenance costs. The trail manager may choose other less costly construction options that do not involve fencing the entire corridor (discussed in Sections 5 and 9).**

6.4 ADDITIONAL NOTES

The following notes are relevant when reading Tables 11 to 13:

-  Map references shown in the tables refer to works items shown on Plans in Appendix 5.
 - Plan 1 covers the section from Ben Lomond Station to Llangothlin.
 - Plan 2 covers the section from Llangothlin to Guyra.
 - Plan 3 covers the section from Guyra to Black Mountain.
-  Works items shown on maps are generally in the precise location (though measurements may vary slightly on the ground). The GPS coordinates are more accurate than the distances due to the nature of the fieldwork.
-  Optional items are included within each of the tables:
 - Each of the three tables includes the option of the development of a parallel bridle trail. Option 1 is a trail for walkers and cyclists with no separate bridle trail. Option 2 is a trail for walkers and cyclists with a separate bridle trail. Option 2 represents the maximum expenditure for Sections 1 and 2 (Ben Lomond to Llangothlin, and Llangothlin to Guyra).
 - Table 13 includes two options (Option A and Option B) designed to ensure the continued operation of railway heritage machinery between the southern part of Guyra Station ground and Ollera Street, Guyra. Option A takes users generally along the eastern side of the corridor, while Option B generally takes users along the western edge of the corridor between these two locations. Option B is the more expensive option.
 - For ease of understanding, the maximum expenditure in each section is used as the basis for calculating associated costs – approvals, contingency, and project management.

6.5 WORKS TABLES

Table 11: Ben Lomond Station to Llangothlin siding (metres) (refer Plan 1 in Appendix 5)

Ref #	GPS Reference	Dist. from beginning (m)	Works Item	\$
1			Construct trail between Ben Lomond Station and Llangothlin (13,480 m).	808,800
2		0 – 13,480	Slashing/side clearing (13,480m).	20,220
			Erect fencing along the corridor (both sides) to create a 6 metre trail envelope (13,480m).	404,400

			<i>Slash and flail bridle trail alongside main trail (if horses are to be permitted) (13,480m).</i>	26,960
3	S 30° 01.286' E 151° 39.612'	0	<p>Trailhead: Ben Lomond Station. Access trail off northern end of station platform. (See Trailhead plan – Appendix 3).</p> <ul style="list-style-type: none"> • Install trailhead sign (brown chevron) on Ben Lomond Road (\$1,600). • Install 2 Trail Directional Markers. Western TDM (Straight Ahead arrow on western face). Eastern TDM (Right turn arrow on western face; Left turn arrow on southern face) (\$1,200). • Install Trailhead map panel (\$5,500). • Install picnic table (\$8,000). • Construct short connecting path from parking area to trail (15 metres) (\$900). 	17,200
4	S 30° 01.390' E 151° 39.650'	210 – 280	New fencing required on eastern side (70m).	1,050
5	S 30° 01.415' E 151° 39.656'	270	Clean out and maintain culvert.	200
6	S 30° 01.476' E 151° 39.677'	397	Retain and renovate existing railway switch.	500
7	S 30° 01.513' E 151° 39.687'	473	Retain/renovate/repaint railway sign.	200
8	S 30° 01.551' E 151° 39.701'	540	<p>Minor road crossing (Un-named road. (see road crossing drawing - Appendix 1).</p> <ul style="list-style-type: none"> • Install “road ahead” signs on both sides of road (\$400). 	8,800

			<ul style="list-style-type: none"> • Install “trail crossing” signs on both sides of trail (\$1,200). • Install management access gates and trail user chicanes (both sides of road) (\$5,400). • Install new cross fence (both sides of road – 120 metres in total) (\$1,800). 	
9	S 30° 01.604' E 151° 39.722'	666	Clean out and maintain culvert.	200
10	S 30° 01.767' E 151° 39.789'	992	Retain/renovate/repaint distance peg (645).	200
11	S 30° 01.812' E 151° 39.815'	1090	Remove cross fence (possible property boundary).	200
12	S 30° 01.921' E 151° 39.886'	1340	Retain timber bridge (12m). Install decking and handrails (the assumption is that the bridge structure is sound).	72,000
13	S 30° 02.006' E 151° 39.936'	1530	Retain/renovate/repaint railway sign. Remove cross fence (possible property boundary).	400
14	S 30° 02.196' E 151° 40.052'	1940	5 pipe culvert – steel pipes in sandbagged wall. Clean out and maintain.	500
15	S 30° 02.220' E 151° 40.064'	1990	Remove cross fence (possible property boundary).	200
16	S 30° 02.079' E 151° 40.077'	2050	Retain/renovate/repaint distance peg (644).	200
17	S 30° 02.401' E 151° 40.107'	2350	SRA sign – notating the highest railway summit in NSW. install interpretive sign.	3,000
18	S 30° 02.401' E 151° 40.107'	2560	Renovate/paint existing sign.	200
19	S 30° 02.589' E 151° 40.076'	2710	2 pipe culvert – steel pipes in concrete wall. Clean out and maintain.	200

20	S 30° 02.779' E 151° 40.041'	3080	Retain/renovate/repaint distance peg (643). Remove cross fence (possible property boundary). From this point, corridor is no longer between 2 roads. Farming activity is on one side while road is on the other.	400
21	S 30° 03.045' E 151° 39.987'	3590	Renovate/paint existing sign.	200
22	S 30° 03.086' E 151° 39.978'	3670	4 pipe culvert – steel pipes in sandbagged wall. Clean out and maintain.	400
23	S 30° 03.313' E 151° 39.934'	4110	Retain/renovate/repaint distance peg. Restore number plate as this is missing (642).	400
24	S 30° 03.377' E 151° 39.922'	4230	5 channel rectangular concrete culvert. Clean out and maintain.	500
25	S 30° 03.470' E 151° 39.907'	4410	1 channel rectangular concrete culvert. Clean out and maintain.	200
26	S 30° 03.580' E 151° 39.907'	4620	Renovate/paint existing sign.	200
27	S 30° 03.839' E 151° 39.986'	5150	Retain/renovate/repaint distance peg. Restore number plate as this is missing (641).	400
28	S 30° 03.995' E 151° 40.093'	5500	3 pipe culvert – steel pipes in rock and sandbagged wall. Clean out and maintain.	300
29	S 30° 04.067' E 151° 40.139'	5660	Mid-point of cutting. Attend to drainage in cutting: Construct trail to a depth of 300mm (rather than a standard 150mm) (100m). Clear side drains.	3,000
30	S 30° 04.074' E 151° 40.148'	5680	Renovate/paint existing sign.	200

31	S 30° 04.116' E 151° 40.181'	5780	2 pipe culvert – steel pipes in rock and sandbagged wall. Clean out and maintain.	200
32	S 30° 04.187' E 151° 40.240'	5950	1 channel rectangular concrete culvert. Clean out and maintain.	200
33	S 30° 04.290' E 151° 40.323'	6210	Driveway crossing: Install Give Way sign on both sides of trail	400
34	S 30° 04.513' E 151° 40.506'	6750	Renovate/paint existing sign.	200
35	S 30° 04.526' E 151° 40.516'	6780	2 pipe culvert – steel pipes in rock and sandbagged wall. Clean out and maintain.	200
36	S 30° 04.624' E 151° 40.577'	6990	2 pipe culvert – steel pipes in rock and sandbagged wall. Clean out and maintain.	200
37	S 30° 04.756' E 151° 40.641'	7270	Retain/renovate/repaint distance peg (639).	200
38	S 30° 04.772' E 151° 40.646'	7300	1 pipe culvert – steel pipes in rock and sandbagged wall. Clean out and maintain.	200
39	S 30° 04.934' E 151° 40.674'	7620	Install 5m Landmark (or similar) bridge.	20,000
40	S 30° 04.992' E 151° 40.688'	7730	Paddock access way (treat as driveway crossing – install Give Way sign on both sides of trail). Stockyard developed on corridor – possible illegal encroachment (can be retained).	400
41	S 30° 05.025' E 151° 40.684'	7800	Renovate/paint existing sign.	200
42	S 30° 05.109' E 151° 40.703'	7970	2 channel rectangular concrete culvert. Clean out and maintain.	200
43	S 30° 05.235' E 151° 40.714'	8210	Brick culvert. Clean out and maintain.	200
44	S 30° 05.281' E 151° 40.719'	8290	Construct comfort stop. Includes picnic table, bike	13,000

			stand (for parking), hitching rail (if horses permitted), sign on trail, 5m connecting path, interpretive signage.	
45	S 30° 05.297' E 151° 40.714'	8340	Retain/renovate/repaint distance peg. Restore number plate as this is missing (638).	400
46	S 30° 05.378' E 151° 40.726'	8490	1 channel rectangular concrete culvert. Clean out and maintain.	200
47	S 30° 05.554' E 151° 40.744'	8830	2 pipe culvert – steel pipes in rock and sandbagged wall. Very overgrown. Clean out and maintain.	200
48	S 30° 05.586' E 151° 40.748'	8900	Remove cross fence and old gate (possible property boundary).	200
49	S 30° 05.802' E 151° 40.773'	9340	1 pipe culvert – steel pipe in concrete wall. Clean out and maintain.	200
50	S 30° 05.802' E 151° 40.773'	9340	Install 50m post and rail barrier – both sides of trail above culvert (100m in total).	10,000
51	S 30° 05.831' E 151° 40.775'	9400	Retain/renovate/repaint distance peg (637).	200
52	S 30° 06.026' E 151° 40.803'	9790	Retain/renovate/repaint yellow speed signs on both side of trail.	200
53	S 30° 06.038' E 151° 40.803'	9810	Brick culvert. Clean out and maintain.	200
54	S 30° 06.100' E 151° 40.814'	9950	Renovate/paint existing sign.	200
55	S 30° 06.110' E 151° 40.817'	9970	Midpoint of cutting. Remove material from rock slide. Attend to drainage in cutting: Construct trail to a depth of 300mm (rather than a standard 150mm). (100m)	51,000

			Install 100 metres (x 6 metres high) wire mesh barrier to prevent rocks falling onto trail surface (either side).	
56	S 30° 06.231' E 151° 40.874'	10200 - 10500	Midpoint of cutting. Attend to drainage in cutting: Construct trail to a depth of 300mm (rather than a standard 150mm) (300m). Install interpretive sign.	9,000
57	S 30° 06.354' E 151° 40.898'	10600	Brick culvert. Clean out (significant amount of rock fall around opening) and maintain.	500
58	S 30° 06.360' E 151° 40.894'	10600	Retain/renovate/repaint distance peg (636).	200
59	S 30° 06.354' E 151° 40.898'	10600	Install 100m post and rail barrier – both sides of trail above culvert (200m in total). 30 metres on north side of culvert and 70 metres on southside.	20,000
60	S 30° 06.450' E 151° 40.884'	10800	Install 80m post and rail barrier – both sides of trail on embankment above culvert (160m in total).	16,000
61	S 30° 06.457' E 151° 40.879'	10800	Culvert. Clean out and maintain.	200
62	S 30° 06.546' E 151° 40.869'	11000	Allow screen planting (100m x 3m) on eastern side of rail corridor. (GPS is centre point).	1,800
63	S 30° 06.560' E 151° 40.857'	11100	Road crossing – Ben Lomond Road. (See road crossing drawing - Appendix 1). <ul style="list-style-type: none"> • Install “road ahead” signs on both sides of road (\$400). • Install “stop” signs on both sides of road (\$400). 	8,200

			<ul style="list-style-type: none"> • Install “trail crossing” signs on both sides of trail (\$1,200). • Install trail user chicanes (both sides of road) (\$4,200). • Remove existing fence (\$200). • Construct new trail (30 metres) on western side of Ben Lomond Rd (\$1,800). 	
64	S 30° 06.626' E 151° 40.875'	11220	Renovate/paint existing sign.	200
65	S 30° 06.713' E 151° 40.923'	11400	1 pipe culvert – steel pipes in rock and sandbagged wall. Clean out and maintain.	200
66	S 30° 06.800' E 151° 41.039'	11660	Brick culvert. Clean out and maintain.	200
67	S 30° 06.820' E 151° 41.064'	11710	Retain /renovate/repaint distance peg (635).	200
68	S 30° 06.981' E 151° 41.231'	12120	Brick culvert. Clean out and maintain.	200
69	S 30° 07.052' E 151° 41.242'	12580	Renovate/paint existing sign.	200
70	S 30° 07.300' E 151° 41.176'	12700	Retain/renovate/repaint distance peg (634).	200
71	S 30° 07.532' E 151° 41.104'	13170	4 channel rectangular concrete culvert (very large). Clean out and maintain.	500
72	S 30° 07.569' E 151° 41.091'	13240	Renovate/paint existing sign.	200
73	S 30° 07.700' E 151° 41.056'	13480	Llangothlin loading platform/station. Install interpretive panel.	3,000
			Allowance for additional landowner requests (e.g. fencing and vegetation screening).	10,000

			Allowance for removal of steel track and sleepers and shaping of basic track by contractor (\$33/metre).	444,840
			Allowance for installation of interpretive signage (at locations to be determined by trail manager and local historians) (6 signs).	18,000
			Allowance for Trail Directional Markers (incorporating emergency markers) to be placed along trail every 1 km.	7,800
			Allowance for installation of trailside furniture (e.g. seats) at locations to be determined by trail manager.	3,000
			Allowance for marking trees to be cleared, pruned or left untouched.	2,400
			Allowance for marking centreline of trail with flagging tape prior to clearing and construction.	3,600
			Allowance for engineering assessment – timber bridge to be retained.	2,000
			Allowance for purchase and installation of: <ul style="list-style-type: none"> • Regulatory signage (Shared Path; “No Trail Bikes”; “Authorised Users Only”); • Road name signs; • Trail name signs; • “No Trespassing” signs; • Local attractions sign; • Miscellaneous signs (Keep Out etc.). 	1,200
			Allowance for traffic management (2 road crossings).	4,000

			Allowance for cable locators at road crossings (2 road crossings).	2,000
			Allowance for adjoining landholder consultation (4 landholders/day).	4,000
			Allowance for construction access – management access gates in fence alongside road and access track onto rail corridor (allow 4 access points in addition to existing road crossings).	8,800
			<i>Option 1: Sub-total (Section 1)</i>	<i>2,062,210</i>
			<i>Option 2: sub-total (Section 1) (maximum estimated expenditure)</i>	<i>2,089,170</i>
			Approvals, permits, applications, designs, specifications, assessments (2.5% of maximum estimated expenditure - \$2,089,170).	52,230
			Contingency amount (15% of maximum estimated expenditure - \$2,089,170).	313,375
			Project management (5% of maximum estimated expenditure - \$2,089,170).	104,460
			<i>TOTAL (NOT INCLUDING GST)</i>	<i>2,559,235</i>

Option 1: walker/cyclist trail: no separate bridle trail.

Option 2: walker/cyclist trails; separate bridle trail.

Table 12: Llangothlin siding to Guyra (metres) (refer Plan 2 in Appendix 5)

Ref #	GPS Reference	Dist. from beginning (m)	Works Item	\$
1			Construct trail between Llangothlin and Guyra (10,390m).	623,400
2		0 – 10,390	Slashing/side clearing (10,390m).	15,585
			Erect fencing along the corridor (both sides) to create a 6 metre trail envelope to Works Item 59 (9,440m).	141,600
			<i>Slash and flail bridle trail alongside main trail to Works Item 59 (if horses are to be permitted) (9,440m).</i>	<i>18,880</i>
3	S 30° 07.722' E 151° 41.044'	0	<p>Road crossing – Llangothlin Rd. (see road crossing drawing - Appendix 1):</p> <ul style="list-style-type: none"> • Install “road ahead” signs on both sides of road (\$400). • Install “trail crossing” signs on both sides of trail (\$1,200). • Install management access gates and trail user chicanes (both sides of road) (\$5,400). • Remove existing fence (\$200). • Install new cross fence (both sides of road – 120 metres in total) (\$1,800). <p>(Trail manager may wish to consider developing a trailhead at Llangothlin platform depending on use. In such a case, a trailhead map panel would need to be</p>	9,000

			installed. An opening in the boundary fence would be needed to allow carpark access. If carpark is located as per the road crossing drawing, the northern chicane and management gate system included in this works item would need to be relocated further north beyond the carpark to be effective).	
4	S 30° 07.785' E 151° 41.032'	120	Culvert. Clean out and maintain.	200
5	S 30° 07.781' E 151° 41.126'	140	Renovate/paint existing speed sign (speed limit missing).	200
6	S 30° 07.781' E 151° 41.126'	200	Retain/renovate/repaint distance peg (633).	200
7	S 30° 07.947' E 151° 40.992'	430	2 channel rectangular concrete culvert. Clean out and maintain.	200
8	S 30° 08.001' E 151° 40.987'	520	Remove cross fence (possible property boundary).	200
9	S 30° 08.084' E 151° 40.983'	680	9 pipe culvert – steel pipes in rock, concrete and sandbagged wall. Clean out and maintain.	500
10	S 30° 08.091' E 151° 40.983'	700	Renovate/paint existing sign.	200
11	S 30° 08.241' E 151° 40.991'	970	5 pipe culvert – steel pipes in rock, concrete and sandbagged wall. Clean out and maintain.	500
12	S 30° 08.256' E 151° 40.994'	1000	2 pipe culvert – steel pipes in rock, concrete and sandbagged wall. Clean out and maintain.	200
13	S 30° 08.294' E 151° 40.997'	1070	Remove cross fence (possible property boundary).	200

14	S 30° 08.358' E 151° 41.003'	1200	Retain/renovate/repaint distance peg (632).	200
15	S 30° 08.569' E 151° 41.022'	1520	Remove cross fence (possible property boundary).	200
16	S 30° 08.647' E 151° 41.029'	1720	1 channel rectangular concrete culvert – major culvert (underpass style). Clean out and maintain.	200
17	S 30° 08.647' E 151° 41.029'	1670 - 1770	Install 100m post and rail barrier – both sides of trail above culvert (200m in total).	20,000
18	S 30° 08.826' E 151° 41.021'	2060	Remove cross fence (possible property boundary).	200
19	S 30° 08.901' E 151° 41.007'	2200	Retain/ renovate/repaint distance peg (631).	200
20	S 30° 09.090' E 151° 40.945'	2560	Brick culvert. Clean out and maintain.	200
21	S 30° 09.090' E 151° 40.945'	2510 - 2610	Install 100m post and rail barrier – both sides of trail above culvert (200m in total).	20,000
22	S 30° 09.139' E 151° 40.924'	2660	Renovate/paint existing sign.	200
23	S 30° 09.423' E 151° 40.870'	3190	1 channel rectangular concrete culvert. Clean out and maintain.	200
24	S 30° 09.437' E 151° 40.884'	3220	Retain/renovate/repaint distance peg (630).	200
25	S 30° 09.549' E 151° 40.928'	3440	Renovate/paint existing sign.	200
26	S 30° 09.595' E 151° 40.949'	3530	1 channel rectangular concrete culvert. Clean out and maintain.	200
27	S 30° 09.610' E 151° 40.958'	3560	Road crossing – Crystalbrook Rd. (See road crossing drawing - Appendix 1):	7,800

			<ul style="list-style-type: none"> • Install “road ahead” signs on both sides of road (\$400). • Install “trail crossing” signs on both sides of trail (\$1,200). • Install management access gates and trail user chicanes (both sides of road) (\$5,400). • Remove existing fence (\$200). • Install new cross fence (both sides of road – 40 metres in total) (\$600). 	
28	S 30° 09.862’ E 151° 41.073’	4030	Midpoint of cutting. Attend to drainage in cutting: Construct trail to a depth of 300mm (rather than a standard 150mm) (500m).	15,000
29	S 30° 09.942’ E 151° 41.097’	4220	Retain/renovate/repaint distance peg. Restore number plate as this is missing (629).	400
30	S 30° 10.155’ E 151° 41.123’	4610	1 channel rectangular concrete culvert. Clean out and maintain.	200
31	S 30° 10.155’ E 151° 41.123’	4590 - 4640	Install 50m post and rail barrier – both sides of trail above culvert (100m in total).	10,000
32	S 30° 10.384’ E 151° 41.099’	5040	Midpoint of cutting. Attend to drainage in cutting: Construct trail to a depth of 300mm (rather than a standard 150mm) (100m).	3,000
33	S 30° 10.463’ E 151° 41.079’	5190	Retain/renovate/repaint distance peg. Restore number plate as this is missing (628).	400
34	S 30° 10.496’ E 151° 41.065’	5260	Brick culvert. Clean out and maintain.	200

35	S 30° 10.535' E 151° 41.047'	5320	Remove cross fence (possible property boundary).	200
36	S 30° 10.671' E 151° 40.981'	5600	Remove cross fence (possible property boundary).	200
37	S 30° 10.720' E 151° 40.951'	5700	Renovate/paint existing sign.	200
38	S 30° 10.888' E 151° 40.850'	6060	Brick culvert. Clean out and maintain.	200
39	S 30° 10.895' E 151° 40.844'	6070	Timber bridge (6m). Install decking and handrails (the assumption is that the bridge structure is sound).	36,000
40	S 30° 10.960' E 151° 40.808'	6210	Retain/renovate/repaint distance peg. Restore number plate as this is missing (627).	400
41	S 30° 11.203' E 151° 40.680'	6700	Renovate/paint existing sign.	200
42	S 30° 11.395' E 151° 40.632'	7070	Brick culvert. Clean out and maintain.	200
43	S 30° 11.480' E 151° 40.618'	7200	Retain/renovate/repaint distance peg. Restore number plate as this is missing (626).	400
44	S 30° 11.581' E 151° 40.601'	7410	1 channel rectangular concrete culvert. Clean out and maintain.	200
45	S 30° 11.623' E 151° 40.595'	7490	Remove cross fence (possible property boundary).	200
46	S 30° 11.675' E 151° 40.584'	7590	1 pipe culvert – steel pipes in rock, concrete and sandbagged wall. Clean out and maintain.	200
47	S 30° 11.742' E 151° 40.572'	7720	Renovate/paint existing sign.	200
48	S 30° 11.943' E 151° 40.543'	8080	Yards and loading platform (historic public use). Install interpretive sign.	3,000
49	S 30° 12.002' E 151° 40.534'	8190	Retain/renovate/repaint distance peg (625).	200

50	S 30° 12.061' E 151° 40.522'	8310	Retain and renovate existing point switches.	500
51	S 30° 12.224' E 151° 40.496'	8610	Private crossover point (possibly unlicensed). Treat as driveway crossing if retained. Install Give Way sign on both sides of trail.	400
52	S 30° 12.271' E 151° 40.488'	8700	Renovate/paint existing sign.	200
53	S 30° 12.281' E 151° 40.487'	8720	1 pipe culvert – steel pipes in rock, concrete and sandbagged wall. Very overgrown. Clean out and maintain.	200
54	S 30° 12.321' E 151° 40.480'	8790	Allow screen planting (70m x 3m) on eastern side of rail corridor (GPS is centrepont).	1,260
55	S 30° 12.327' E 151° 40.469'	8720 - 8820	Relocate trail on western edge of corridor (for 100 metres) as it passes quite close to existing house.	9,000
56	S 30° 12.421' E 151° 40.464'	8980	1 channel rectangular concrete culvert. Clean out and maintain.	200
57	S 30° 12.538' E 151° 40.444'	9190	Retain/renovate/repaint distance peg (624).	200
58	S 30° 12.550' E 151° 40.442'	9220	1 channel rectangular concrete culvert. Clean out and maintain.	200
59	S 30° 12.667' E 151° 40.421'	9440	Possible property boundary cross fence (note biosecurity sign on gate – possibly illegal). Install gating system at this point to control access to trail (management access gate, chicane and cross fencing). End separate slashed bridle trail.	3,450
60	S 30° 12.806' E 151° 40.400'	9700	Renovate/paint existing sign.	200

61	S 30° 12.840' E 151° 40.394'	9760	1 channel rectangular concrete culvert. Clean out and maintain.	200
62	S 30° 12.968' E 151° 40.374'	10000	1 channel rectangular concrete culvert. Clean out and maintain.	200
63	S 30° 13.027' E 151° 40.355'	10120	Road crossing – Ollera Street, Guyra. (see road crossing drawing - Appendix 1): <ul style="list-style-type: none"> • Install “road ahead” signs on both sides of road (\$400). • Install “stop” signs on both sides of road (\$400). • Install “trail crossing” signs on both sides of trail (\$1,200). • Install management access gates and trail user chicanes (both sides of road) (\$5,400). • Remove existing steel chicane/wire gating system on south side of road (\$500). 	7,900
64	S 30° 13.031' E 151° 40.365'	10120	Southern side of road crossing. Remove existing footpath and widen to 2.5 metres (to Works Item 68) (270m). Install Trail Directional Marker. On northern face, attach Left turn arrow (trail icon). On eastern face, attach Left turn arrow (trail icon).	81,600
65	S 30° 13.038' E 151° 40.379'	10140	Relocate Inverell green chevron as footpath is to be widened.	200
66	S 30° 13.110' E 151° 40.370'	10300	Existing footpath turns west between picnic tables.	0
67	S 30° 13.117' E 151° 40.366'	10310	Big Lamb – no works needed.	0

68	S 30° 13.161' E 151° 40.358'	10390	Trailhead – Guyra. (See Trailhead plan – Appendix 3): <ul style="list-style-type: none"> • Install trailhead sign (brown chevron) on New England Highway (\$1,600). • Install Trailhead map panel (\$5,500). 	7,100
			Allowance for additional landowner requests (e.g. fencing and vegetation screening).	10,000
			Allowance for removal of steel track and sleepers and shaping of basic track by contractor (\$33/metre).	444,840
			Allowance for installation of interpretive signage (at locations to be determined by trail manager and local historians) (6 signs).	18,000
			Allowance for Trail Directional Markers (incorporating emergency markers) to be placed along trail every 1 km.	7,800
			Allowance for installation of trailside furniture (e.g. seats) at locations to be determined by trail manager.	3,000
			Allowance for marking trees to be cleared, pruned or left untouched.	2,400
			Allowance for marking centreline of trail with flagging tape prior to clearing and construction.	3,600
			Allowance for engineering assessment – timber bridge to be retained.	2,000
			Allowance for purchase and installation of:	1,200

			<ul style="list-style-type: none"> Regulatory signage (Shared Path; "No Trail Bikes"; "Authorised Users Only"); Road name signs; Trail name signs; "No Trespassing" signs; Local attractions sign; Miscellaneous signs (Keep Out etc.) 	
			Allowance for traffic management (3 road crossings).	6,000
			Allowance for cable locators at road crossings (3 road crossings).	3,000
			Allowance for adjoining landholder consultation (4 landholders/day).	4,000
			Allowance for construction access – management access gates in fence alongside road and access track onto rail corridor (allow 3 access points in addition to existing road crossings).	6,600
			<i>Option 1: Sub-total (Section 2)</i>	<i>1,538,835</i>
			<i>Option 2: sub-total (Section 2) (maximum estimated expenditure)</i>	<i>1,557,715</i>
			Approvals, permits, applications, designs, specifications, assessments (2.5% of maximum estimated expenditure - \$1,557,715).	38,945
			Contingency amount (15% of maximum estimated expenditure - \$1,557,715).	233,655
			Project management (5% of maximum estimated expenditure - \$1,557,715).	77,885
			TOTAL (NOT INCLUDING GST)	1,908,200

Option 1: walker/cyclist trail: no separate bridle trail.

Option 2: walker/cyclist trails; separate bridle trail.

Table 13: Guyra to Black Mountain Station (11,362 metres) (refer Plan 3 in Appendix 5)

Ref #	GPS Reference	Dist. from beginning (m)	Works Item	\$
1	S 30° 13.161' E 151° 40.358'	0	Trailhead – Guyra (see Table 2).	0
2		S 30° 13.183' E 151° 40.355'	End of existing path. Construct new sealed trail (same as existing footpath material) to Sandon Street Works Item 6 (643m).	132,600
			Erect fencing along the corridor (both sides) to create a 6 metre trail envelope from Works Item 24 to Works Item 69 (9,358m).	140,370
3		S 30° 13.205' E 151° 40.353'	Trail to turn west to run between trees and railway corridor. Moderate clearing needed through trees (10m).	100
4		S 30° 13.255' E 151° 40.341'	Intersect existing footpath (running east-west). Install Trail Directional Marker. On northern face, attach Right turn arrow (shops, parking icons) and 45° Left turn arrow (trail icon). On western face, attach Left turn arrow and 45° Right turn arrow (trail icons). Continue trail in south easterly direction between property fence and highway (note this is currently used by house residents for front-of-house parking). Install Give Way signs as appropriate on southern side of house (driveway crossing).	1,000
5		S 30° 13.297' E 151° 40.339'	Trail to turn south west to run between trees and bushes/railway corridor.	100

			Moderate clearing needed through trees (10m).	
6	S 30° 13.518' E 151° 40.296'	676	Construct 20 metre concrete floodway as trail over drainage line.	10,000
<p><i>Two options are proposed for passing through railway station yard due to desire for use by railway operators. Options A and B are listed separately. Cumulative distances are not recorded as these are options.</i></p> <p><i>Option A proposes to use the existing vehicle track on the eastern side of the railway station yard. This option would also involve constructing a new trail along the eastern side of the corridor north of Sandon Street.</i></p> <p><i>Option B proposes to remove the western-most railway line in the railway station yard south of Sandon Street and to develop the trail on this alignment. This option would also involve removing the existing footpath along the western side of the corridor north of Sandon Street (it is too narrow for shared use) and constructing a new trail in its place on the same alignment.</i></p>				
Option A				
7A	S 30° 13.525' E 151° 40.295'		Construct new sealed trail (same as existing footpath material) to Sandon Street (230m). Install Trail Directional Marker. On northern face, attach Straight ahead arrow (trail icon). On southern face, attach Straight ahead arrow (trail icon).	46,600
8A	S 30° 13.647' E 151° 40.281'		End new trail construction. Road crossing – Sandon Street. (see road crossing drawing - Appendix 1): <ul style="list-style-type: none"> • Install “road ahead” signs on both sides of road (\$400). • Install “stop” signs on both sides of road (\$400). • Install “trail crossing” signs on both sides of trail (\$1,200). • Install Trail Directional Markers on both sides of road. On northern face, 	6,200

			attach Straight ahead arrow. On southern face, attach Straight ahead arrow (\$1,200). Install pipe culvert and fill over on both sides of road crossing (3m long x 1.5m deep x 2.5m wide) (\$3,000).	
9A	S 30° 13.657' E 151° 40.278'		Seal existing access road (tenure to be confirmed). Create shared zone to locked gate (map reference S 30° 13.770' E 151° 40.270'). Install relevant signage.	13,200
10A	S 30° 13.707' E 151° 40.275'		Machinery Museum corner Gate. No work required.	0
11A	S 30° 13.768' E 151° 40.266'		Create steps and wheeling ramp (or slope) onto rail yard.	11,000
12A	S 30° 13.772' E 151° 40.261'		Construct new trail and trail bed to link to Works Item 14 (35m).	3,150
<i>Total cost – Option A</i>				<i>\$80,150</i>
<i>Option B</i>				
7B	S 30° 13.541' E 151° 40.293'	N/A	Construct 10m of sealed trail to connect to existing bitumen apron on eastern side of underpass. Install Trail Directional Marker. On northern face, attach Right turn arrow (trail icon). On western face, attach Left turn arrow (trail icon).	2,600
8B	S 30° 13.539' E 151° 40.270'	N/A	Western end of existing underpass apron. Construct new hard surface trail to link to existing footpath along Lagoon Road (30m).	6,000
9B	S 30° 13.546' E 151° 40.253'	N/A	Remove existing footpath and widen to 2.5 metres to Sandon Street crossing - Works Item 10B (200m).	60,600

			Install Trail Directional Marker. On eastern face, attach Left turn arrow (trail icon). On southern face, attach Right turn arrow (trail icon).	
10B	S 30° 13.644' E 151° 40.260'	N/A	<p>Northern side of Sandon Street. Cross to eastern edge of yellow bollards.</p> <p>Road crossing – Sandon Street. (see road crossing drawing - Appendix 1):</p> <ul style="list-style-type: none"> • Install “road ahead” signs on both sides of road (\$400). • Install “Stop” signs on both sides of road (\$400). • Install “trail crossing” signs on road (\$1,200). • Install Trail Directional Markers on both sides of road. On northern face, attach Straight ahead arrow. On southern face, attach Straight ahead arrow (\$600). <p>Install pipe culvert and fill over on both sides of road crossing (3m long x 1.5m deep x 2.5m wide) (\$3,000).</p>	5,600
11B	S 30° 13.650' E 151° 40.259'	N/A	Construct new concrete path to link from bollards to trail on railway station (10m). Install pipe culvert under path.	2,500
12B	S 30° 13.654' E 151° 40.260'		<p>New path links with new rail trail.</p> <p>Construct new trail on site of western most railway line (remove line) to junction with Works Item 14 (where Option A and B come together) (225m).</p>	13,500

13B			Slashing between Works Item 12B and Works Item 14 (225m).	225
	S 30° 13.721' E 151° 40.249'		Mid-point station building. Station ground and corridor to the north of Sandon Rd includes number of restored railway artefacts - signals, switches and distance posts – all restored. Retain all artefacts.	0
<i>Total cost – Option B</i>				<i>\$91,025</i>
<i>End of Options A and B. Trail now back in one location built over western-most existing railway line. Cumulative distances re-set to 0 metres</i>				
14	S 30° 13.770' E 151° 40.240'	0	Junction of Option A and Option B. If Option A is chosen, user will cross 3 rail lines to get to new trail on western most railway line. As this section of trail is to be closed during events involving railway machines (from this point south to Works Item 24), there is limited need for cautionary signage.	0 (cautionary signage may be needed)
15		0-150	Construction of new trail on site of western most railway line (remove line) (150m).	9,000
16		0-400	Slashing between WI 14 and WI 20 (400m).	400
17	S 30° 13.845' E 151° 40.234'	150	Trail to cross over existing railway line. New trail and new trail bed to be constructed east of existing railway lines to Works Item 20 (250m). Option allows railway machines to run to current southern extent (Works Item 24).	22,500
18	S 30° 13.921' E 151° 40.217'	274	Restored signal and switch. Install seat in this vicinity overlooking lagoon.	500

19	S 30° 13.967' E 151° 40.205'	364	Southern end of 3 rd track.	0
20	S 30° 14.067' E 151° 40.204'	400-720	<p>To properly allow for drainage (original railway line built on an embankment), construct a higher embankment and boardwalk in this location. Trail to be built with 400 mms of additional fill (above normal trail bed) will be needed across this low-lying section (to Works Item 24).</p> <p>Build sequence (from north) is 30 metres of raised embankment; 10 metre boardwalk; 100 metres of raised embankment. 2 pipe culvert will also be needed under the southern arm of this embankment (\$22,800).</p> <p>New trail and new trail bed to be constructed either side of above section (180m) (\$16,200).</p>	39,000
21	S 30° 14.077' E 151° 40.190'	444	<p>Brick culvert.</p> <p>Major Clean out needed and maintain (to ensure water does not bank up over new trail to the east).</p>	500
22	S 30° 14.159' E 151° 40.169'	710	Retain/ renovate/repaint distance peg (621).	200
23	S 30° 14.159' E 151° 40.169'	710 -725	Resume new trail construction (normal height trail bed) (15m).	1,350
24	S 30° 14.151' E 151° 40.177'	720	<p>Possible southern extent of railway machines (such as trikes) run. End of new constructed trail and trail bed.</p> <p>Rail trail to be built on line of existing railway line from this point to Black Mountain station (line to be removed).</p>	5,525

			<p>Install a new cross fence (55 metres) and management access gate (on trail) (\$1,825)</p> <p>Construct 30 metres of new trail between railway line/rail trail and western boundary fence (\$2,700).</p> <p>Install management access gate in western boundary fence (\$1,000).</p> <p>This approach allows for event management on the rail trail when events involve the use of the railway machines. Railway machines will run from this point to the Ollera Road crossing. The gate will be closed on the rail trail and users will divert off the trail (through the open gate in the western boundary fence) onto Lagoon Road and re-join the rail trail north of Sandon Street. When there are no events, the gate on the trail is to be left open (and the gate on the boundary fence is to be closed). It will be the responsibility of the event organiser to open and close gates as necessary.</p>	
25		725- 10210	Construct trail between end of operating rail track (for trike) and Black Mountain station (9485m).	569,100
			<i>Slash and flail bridle trail alongside main trail from Works Item 24 to Works Item 69 (9,358m) (if horses are to be permitted).</i>	18,716
26	S 30° 14.307' E 151° 40.154'	1030	Retain/restore railway signal.	200
27	S 30° 14.416' E 151° 40.136'	1240	Renovate/paint existing sign.	200

28	S 30° 14.464' E 151° 40.125'	1340	Remove cross fence.	200
29	S 30° 14.627' E 151° 40.098'	1595	Small concrete culvert. Clean out and maintain.	200
30	S 30° 14.684' E 151° 40.089'	1760	Retain/renovate/repaint distance peg (620).	200
31	S 30° 14.694' E 151° 40.088'	1780 - 10210	Slashing/side clearing (8,430m).	12,645
32	S 30° 14.725' E 151° 40.083'	1850	Mid-point of cutting. Attend to drainage in cutting: Construct trail to a depth of 300mm (rather than a standard 150mm). (100m). Moderate clearing needed through cutting (100m).	3,680
33	S 30° 14.802' E 151° 40.070'	1990	10 metre existing bridge over road. Install deck and handrails (the assumption is that the bridge structure is sound). Remove gate across corridor (northern side of bridge).	60,200
34	S 30° 14.949' E 151° 40.044'	2280	Renovate/paint existing sign.	200
35	S 30° 15.079' E 151° 40.023'	2520	Small concrete culvert. Clean out and maintain.	200
36	S 30° 15.277' E 151° 40.002'	2780	Small concrete culvert. Clean out and maintain.	200
37	S 30° 15.219' E 151° 40.000'	2800	Retain/renovate/repaint distance peg (619).	200
38	S 30° 15.379' E 151° 39.974'	3110	Small concrete culvert. Clean out and maintain.	200
39	S 30° 15.487' E 151° 39.955'	3320	Renovate/paint existing sign (note post only exists).	200
40	S 30° 15.568' E 151° 39.941'	3470	Renovate/paint existing speed sign.	200
41	S 30° 15.657' E 151° 39.926'	3640	Construct comfort stop on western side of trail amongst trees. Includes bench seat and picnic table, bike stand (for parking), hitching rail (if horses permitted), interpretive signage.	13,000

42	S 30° 15.726' E 151° 39.919'	3780	Renovate/paint existing speed sign.	200
43	S 30° 15.739' E 151° 39.917'	3810	Road crossing - Williams Lane. (see road crossing drawing - Appendix 1): <ul style="list-style-type: none"> • Install “road ahead” sign on both sides (\$400). • Install “trail crossing” signs on both sides of road (\$1,200). • Install management access gates and trail user chicanes (both sides of road) (\$5,400). • Restore railway crossing signs lying in corridor (\$500). 	7,500
44	S 30° 15.756' E 151° 39.912'	3840	Retain/renovate/repaint distance peg (618).	200
45	S 30° 16.020' E 151° 39.972'	4380	Major brick culvert (clearance of 2.5 metres). Clean out and maintain.	500
46	S 30° 16.196' E 151° 40.142'	4830	Brick culvert. Clean out and maintain.	200
47	S 30° 16.361' E 151° 40.326'	5270	Construct rock battering (80m) on north-western side of cutting to address major landslip issue.	24,000
48	S 30° 16.466' E 151° 40.389'	5500	Mid-point of cutting. Attend to drainage in cutting: Construct trail to a depth of 300mm (rather than a standard 150mm) (300m).	9,000
49	S 30° 16.692' E 151° 40.403'	5950	Remove cross fence (possible property boundary). Retain/renovate/repaint distance peg (616).	400
50	S 30° 16.832' E 151° 40.334'	6240	Retain timber bridge (5m). Install decking and handrails. Remove rails, sleepers, top girder and second row of sleepers Install deck and handrails (the assumption is that the bridge structure is sound).	30,000

51	S 30° 16.907' E 151° 40.283'	6410	Driveway crossing. Install “give way” signs on trail.	400
52	S 30° 17.171' E 151° 40.118'	6980	Retain/renovate/repaint distance peg (615).	200
53	S 30° 17.193' E 151° 40.101'	7030	Small water crossing (5 m). Remove timber cross pieces. Re-deck using existing concrete abutments and concrete girders.	30,000
54	S 30° 17.240' E 151° 40.071'	7130	Mid-point of cutting. Attend to drainage in cutting: Construct trail to a depth of 300mm (rather than a standard 150mm) (120m).	3,600
55	S 30° 17.406' E 151° 39.963'	7500	Renovate/paint existing sign. Remove posts between Works Item 52 and 53 as they are of no interest.	400
56	S 30° 17.649' E 151° 39.831'	8010	Retain/renovate/repaint distance peg (614).	200
57	S 30° 17.798' E 151° 39.830'	8300	Mid-point of major (9 channel) rectangular concrete culvert. Clean out and maintain. Install 50m post and rail barrier – both sides of trail above culvert (100m in total).	11,000
58	S 30° 17.875' E 151° 39.826'	8450	(Optional). Construct 40 metres trail heading east off rail trail to connect to smoked trout establishment. Install self-closing pedestrian gate in fence for trail users. Install sign on trail with directions to establishment.	4,000
59	S 30° 17.919' E 151° 39.815'	8540	Renovate/paint existing sign.	200
60	S 30° 18.083' E 151° 39.700'	8910	Rectangular concrete culvert. Clean out and maintain.	200
61	S 30° 18.126' E 151° 39.630'	9050	Retain/renovate/repaint distance peg (613).	200
62	S 30° 18.147' E 151° 39.592'	9130	Renovate/paint existing sign.	200
63	S 30° 18.156' E 151° 39.564'	9180	Brick culvert. Clean out and maintain.	3,200

			Install interpretive sign about brick culverts (this type of culvert is very common on this rail corridor).	
64	S 30° 18.283' E 151° 39.381'	9571	Renovate/paint existing sign.	200
65	S 30° 18.313' E 151° 39.366'	9644	1 pipe culvert – steel pipes in rock, concrete and sandbagged wall. Clean out and maintain.	200
66	S 30° 18.350' E 151° 39.346'	9722	Remove cross fence (possible property boundary).	
67	S 30° 18.409' E 151° 39.335'	9840	1 pipe culvert – steel pipes in rock, concrete and sandbagged wall. Clean out and maintain.	200
68	S 30° 18.453' E 151° 39.336'	9926	Loading platform – no action required.	0
69	S 30° 18.525' E 151° 39.359'	10083	Road crossing – Toms Gully Rd. see road crossing drawing - Appendix 1): <ul style="list-style-type: none"> • Install “road ahead” sign on both sides (\$400). • Install “trail crossing” signs on both sides of road (\$1,200). • Install management access gates and trail user chicanes (north side of road only) (\$2,700). • Install new fencing to corridor boundary on both sides on northern side of road (\$1,350). • Install “give way” sign on southern side (\$200). 	5,850
70	S 30° 18.581' E 151° 39.396'	10210	Trailhead – Black Mountain Station (GPS reading is outside booking office). (See Trailhead plan – Appendix 3). Station ground includes signal, switches and distance peg (612) – all restored.	16,300

			<ul style="list-style-type: none"> • Install trailhead sign (brown chevron) on Toms Gully Road (\$1,600). • Install Trail Directional Marker (Straight Ahead arrow on southern face; Right Turn arrow on northern face) (\$600). • Install Trailhead map panel (\$5,500). • Install picnic table (\$8,000). • Install short connecting path from parking area to trail (10 metres) (\$600). 	
			Allowance for clearing of blackberries.	3,000
			Allowance for additional landowner requests (e.g. fencing and vegetation screening).	15,000
			Allowance for removal of steel track and sleepers and shaping of basic track by contractor (\$33/metre).	317,955
			Allowance for installation of interpretive signage (at locations to be determined by trail manager and local historians) (6 signs).	18,000
			Allowance for Trail Directional Markers (incorporating emergency markers) to be placed along trail every 1 km.	6,000
			Allowance for installation of trailside furniture (e.g. seats) at locations to be determined by trail manager.	3,000
			Allowance for marking trees to be cleared, pruned or left untouched.	2,400
			Allowance for marking centreline of trail with flagging tape prior to clearing and construction.	3,600

			Allowance for engineering assessment – timber bridges to be retained.	6,000
			Allowance for purchase and installation of: <ul style="list-style-type: none"> • Regulatory signage (Shared Path; “No Trail Bikes”; “Authorised Users Only”); • Road name signs; • Trail name signs; • “No Trespassing” signs; • Local attractions sign; • Miscellaneous signs (Keep Out etc.). 	1,200
			Allowance for traffic management (3 road crossings).	6,000
			Allowance for cable locators at road crossings (3 road crossings).	3,000
			Allowance for adjoining landholder consultation (4 landholders/day).	8,000
			Allowance for construction access – management access gates in fence alongside road and access track onto rail corridor (allow 3 access points in addition to existing road crossings).	6,600
			<i>Option 1A: Sub-total (Section 3)</i>	<i>1,652,625</i>
			<i>Option 1B: Sub-total (Section 3)</i>	<i>1,671,341</i>
			<i>Option 2A: Sub-total (Section 3)</i>	<i>1,663,500</i>
			<i>Option 2B: sub-total (Section 3) (maximum estimated expenditure).</i>	<i>1,682,216</i>
			Approvals, permits, applications, designs, specifications, assessments (2.5% of maximum estimated expenditure – \$1,682,216).	42,055
			Contingency amount (15% of maximum estimated expenditure – \$1,682,216).	252,330

			Project management (5% of maximum estimated expenditure – \$1,682,216).	84,110
			<i>TOTAL (NOT INCLUDING GST)</i>	<i>2,060,711</i>

Option 1A: walker/cyclist trail: no separate bridle trail; Option A through Guyra

Option 1B: walker/cyclist trail: separate bridle trail; Option B through Guyra

Option 2A: walker/cyclist trail; no separate bridle trail; Option A through Guyra

Option 2B: walker/cyclist trail; no separate bridle trail; Option B through Guyra

Table 14: Total Costs: Ben Lomond Station to Black Mountain Station

(For Option 2B: walker/cyclist trail; separate bridle trail; Option B through Guyra. The maximum estimated expenditure)

Section	Cost
<i>Section 1: Ben Lomond Station to Llangothlin</i>	<i>\$2,559,235</i>
<i>Section 2: Llangothlin to Guyra</i>	<i>\$1,908,200</i>
<i>Section 3: Guyra to Black Mountain Station</i>	<i>\$2,060,711</i>
<i>Total (excluding GST)</i>	<i>\$6,528,146</i>

6.6 EXTENDING THE RAIL TRAIL

ARMIDALE TO BLACK MOUNTAIN; BEN LOMOND TO GLEN INNES

As noted in 6.1, the project has not included detailed investigations of the corridor between Armidale and Black Mountain, and between Ben Lomond and Glen Innes. Some fieldwork was carried out looking at parts of this corridor that were accessible or viewable from public roads. Mapping was also used to determine locations and probable sizes of bridges in particular (many of the longer bridges were inspected as part of fieldwork).

These investigations (in combination with detailed work done on the corridor between Black Mountain and Ben Lomond), enable a reasonable indication of the work required to bring about the development of a rail trail between Armidale and Black Mountain, and between Ben Lomond and Glen Innes i.e. creating a New England Rail Trail between Armidale and Glen Innes, a distance of approximately 103 kilometres.

The distances between locations are as follows (based on the *Armidale to Glen Innes Rail Gradients and Alignments 1999* document).

Armidale to Black Mountain	33.06 kms
Armidale to Dumaresq	9.828 kms
Dumaresq to Exmouth	11.378 kms
Exmouth To Black Mountain	11.854 kms
Ben Lomond to Glen Innes	35.45 kms
Ben Lomond to Glencoe	14.205 kms
Glencoe to Stonehenge	12.559 kms
Stonehenge to Glen Innes	8.687 kms

The costs of construction of the proposed extension are an estimate of probable costs only. Accurate costs can only be determined, firstly, by the compilation of more detailed works lists accomplished through individual, detailed trail development plans (achieved through walking the corridor) for each section of the proposed rail trail (as has been carried out for the Black Mountain to Ben Lomond section) and, secondly, via a tendering process.

The costs for development of the trail (bridges, trail construction, etc) are based on conditions likely to be encountered during construction. As accurate measurements have not been made, it is not possible to be precise in quantifying costs. It is only after a detailed trail development plan is prepared (including a full traverse of each section) that more definite quantities and costs can be provided.

Bridge assessments have not involved a detailed examination and further detailed assessments will be required to accurately establish the condition of timber bridge components.

For the purposes of determining costs for this extension, the per unit construction rates are as per the costs contained in Section 6.3 above (and reproduced in the tables). The tables also include an estimate of the total length or quantity.

Preliminary fieldwork revealed the following major works items:

Armidale to Black Mountain

- ✚ 4 bridges between Black Mountain and Armidale (2 bridges are approximately 4 metres long, while 2 are approximately 15 metres long). Included in this list is the viaduct over McLennan Street in Armidale which Armidale Regional Council has recently passed a resolution asking for it to be removed. The other 3 bridges are “brick and steel” – brick abutments and steel I-beams. These are assumed to be sound and will need re-decking and handrailing (at a cost of \$6,000/lineal metre).
- ✚ 12 road crossings (including 4 that appear to be private access roads). These will be dealt with as all road crossings are with a gating system and appropriate signage.
- ✚ 49 culverts in a range of sizes and constructed with a variety of materials. These will need to be cleaned and maintained. An average of \$300/culvert for cleaning has been allowed for. Some of these culverts will be under steep embankments. An allowance is provided for safety fencing (post and rail) above some of these culverts along some of these embankments.

The railway also passes under Boorolong Road. It is assumed that this underpass does not need any work.

Ben Lomond to Glen Innes

- ✚ 16 bridges between Glen Innes and Ben Lomond, ranging in size from 4 metres to 120 metres. Included in this list are three substantial bridges over Beardy Waters (120 metres), Marowan Creek (62 metres), and Williams Creek (28 metres). The condition of the bridges (based upon a visual inspection) varies (note that not all were inspected). This number includes some underpasses (for drainage, stock and vehicles). Repairs for the 4 significant bridges have been costed at \$11,000/lineal metre. Repairs to other bridges have been costed at \$6,000/lineal metre. An allowance for replacement of 4 small bridges by prefabricated bridges has been made.
- ✚ 12 road crossings (including 4 that appear to be private access roads). These will be dealt with as all road crossings are with a gating system and appropriate signage. One of these road crossings is an at-grade crossing of the New England Highway. This presents a set of design challenges, but these have been addressed before with other rail trails.



Underpasses at major roads are a solution to difficult road crossings. Above left: A concrete box culvert such as on the Port Fairy Warrnambool Rail Trail is one solution. Above right: A steel pipe has been put in the railway embankment at Guyra to provide pedestrian access from one side to the other.

- 33 culverts in a range of sizes and constructed with a variety of materials. These will need to be cleaned and maintained. An average of \$300/culvert for cleaning has been allowed for. An allowance is provided for safety fencing (post and rail) above some of these culverts along some of these embankments.

There are 3 locations where the railway passes under the road. Again, it is assumed that these underpasses are structurally sound and no work is required.

Tables 15 and 16 give an indication of costs for construction of a rail trail along between Armidale and Black Mountain, and between Ben Lomond and Glen Innes. Detailed costings should be prepared through a trail development planning process (as has been done for the Ben Lomond to Black Mountain section) if the Councils determine to proceed with further planning and development. The costs of a trail development plan for each section is of the order of \$35,000 (plus GST).

Table 15 – Armidale to Black Mountain: Indicative Construction Costs

Activity	Unit	Unit cost (\$)	Quantity	\$
Construct trail between Armidale Station and Black Mountain Station.	metre	60	33,060	1,983,600
Slashing/side clearing	kilometre	1,500	33.06	49,590
Erect fencing along the corridor (both sides) to create a 6 metre trail envelope (it is assumed this will be the approach taken to fencing and ongoing maintenance).	metre	15	66,120	991,800
Slash and flail bridle trail alongside main trail (if horses are to be permitted).	kilometre	2,000	33.060	66,120
Trailheads: allow for signage, parking provision, short connecting trails, picnic tables.	Ea.	17,000	4	68,000
Culverts: Clean out and maintain.	Ea.	300	49	14,700
Allowance for post and rail safety fencing on some embankments (above culverts).	metre	100	1,500	15,000
Road crossings.	Ea.	7,000	12	84,000
Bridges: re-deck and install handrails (3 bridges: excludes the bridge over McLennan St).	metre	6,000	25	150,000
Bridges: renovate, re-deck and install handrails. This allows for more work to be one on bridge superstructure such as replacing	No bridges need this treatment (based on visual inspection and materials used)			

girders (see Section 5.8 for more discussion).				
Bridges: replace existing bridges in poor condition with pre-fabricated bridges.	No bridges need this treatment (based on visual inspection and materials used)			
Allowance for retain/renovate/repaint railway signage and infrastructure (signals, switches).				20,000
Allowance for rehabilitation of drainage through cuttings.	metre	30	3,000	90,000
Allowance for removing cross fences.	Ea.	200	20	4,000
Allowance for installation of new structures at property boundaries to replace existing cattle stops (this was not an issue in the Ben Lomond to Black Mountain section given the nature of adjoining land with roads on one side along much of the corridor. It is more likely to be an issue in this corridor as it is more "remote" and passes through land with farming properties on both sides).	Ea.	3,800	10	38,000
Allowance for installation of stock crossings (grids, gates, etc) to permit stock/machinery to cross from one side of corridor to the other (note above about nature of corridor applies).	Ea.	6,000	20	120,000
Allowance for removal of steel track and sleepers and shaping of basic track by contractor.	metre	33	33,060	1,090,980
Allowance for installation of interpretive signage.	Ea.	3,000	11	33,000
Allowance for Trail Directional Markers (incorporating emergency markers) to be placed along trail every 1 km.	Ea.	600	33	19,800
Allowance for installation of trailside furniture (e.g. seats).	Ea.	500	15	7,500

Allowance for marking trees to be cleared, pruned or left untouched.				6,000
Allowance for marking centreline of trail with flagging tape prior to clearing and construction.				9,000
Allowance for engineering assessment – 3 timber bridges to be retained.				12,000
Allowance for purchase and installation of miscellaneous signage.				3,600
Allowance for landowner requests (e.g. fencing and vegetation screening).				45,000
Allowance for additional construction costs. This section of corridor is less accessible from nearby roads than the corridor from Ben Lomond to Black Mountain. This means that more time will be spent hauling material from stockpile sites created where the railway corridor crosses a publicly accessible road. One way to reduce this cost is negotiate access agreements with landholders who adjoin the corridor. Some may be willing to provide access (material can be stockpiled on the railway corridor). An allowance of 5% of construction costs has been included to allow for this additional time.				250,000
Allowance for cable locators and traffic management.				36,000
Allowance for adjoining landholder consultation (4 landholders/day).				48,000
<i>Total</i>				<i>5,255,690</i>
Approvals, permits, applications, designs, specifications, assessments (2.5% of estimated expenditure - \$5,225,690).				131,390

Contingency amount (15% of estimated expenditure - \$5,225,690).				788,355
Project management (5% of estimated expenditure - \$5,225,690).				262,785
TOTAL (NOT INCLUDING GST)				\$6,438,310

Approvals, permits, applications, designs, specifications, assessments will require an allowance of 2.5% of construction costs.

A contingency of 15% of construction costs should be allowed.

An allowance of 5% of construction costs should be allowed for project management.

Table 16 – Ben Lomond to Glen Innes: Indicative construction costs

Activity	Unit	Unit cost (\$)	Quantity	\$
Construct trail between Ben Lomond Station and Glen Innes Station.	metre	60	35,450	2,127,000
Slashing/side clearing.	kilometre	1,500	35.45	53,175
Erect fencing along the corridor (both sides) to create a 6 metre trail envelope (it is assumed this will be the approach taken to fencing and ongoing maintenance).	metre	15	70,900	1,063,500
Slash and flail bridle trail alongside main trail (if horses are to be permitted).	kilometre	2,000	35.45	70,900
Trailheads: allow for signage, parking provision, short connecting trails, picnic tables (Glencoe and Glen Innes. A trailhead should be considered at Stonehenge but this requires careful planning to address requirements around the Gun Club and the Recreation Reserve).	Ea.	17,000	2	34,000
Culverts: Clean out and maintain.	Ea.	300	33	9,900
Allowance for post and rail safety fencing on some embankments (above culverts)	metre	100	3,000	30,000

Road crossings.	Ea.	7,000	11	84,000
Road crossing – New England Highway (install underpass).	Ea.	300,000	1	300,000
Bridges: re-deck and install handrails (8 bridges).	metre	6,000	99	594,000
Bridges: renovate, re-deck and install handrails. This allows for more work to be one on bridge superstructure such as replacing girders (see Section 5.8 for more discussion) (4 bridges – Beardy Waters, Williams Creek, Upper Williams Creek, Marowan Creek).	metre	11,000	226	2,486,000
Bridges: replace existing bridges in poor condition with pre-fabricated bridges (4 bridges).	metre	4,000	20	80,000
Allowance for retain/renovate/repaint railway signage and infrastructure (signals, switches).				20,000
Allowance for rehabilitation of drainage through cuttings.	metre	30	3,000	90,000
Allowance for removing cross fences.	Ea.	200	20	4,000
Allowance for installation of new structures at property boundaries to replace existing cattle stops (this was not an issue in the Ben Lomond to Black Mountain section given the nature of adjoining land with roads on one side along much of the corridor. It is more likely to be an issue in this corridor as it is more “remote” and passes through land with farming properties on both sides).	Ea.	3,800	10	38,000
Allowance for installation of stock crossings (grids, gates, etc) to permit stock/machinery to cross from one side of corridor to the other (note above about nature of corridor applies).	Ea.	6,000	20	120,000

Allowance for removal of steel track and sleepers and shaping of basic track by contractor.	metre	33	35,450	1,169,850
Allowance for installation of interpretive signage.	Ea.	3,000	11	33,000
Allowance for Trail Directional Markers (incorporating emergency markers) to be placed along trail every 1 km.	Ea.	600	35	21,000
Allowance for installation of trailside furniture (e.g. seats)	Ea.	500	15	7,500
Allowance for marking trees to be cleared, pruned or left untouched.				6,000
Allowance for marking centreline of trail with flagging tape prior to clearing and construction.				9,000
Allowance for engineering assessment – 13 timber bridges to be retained				52,000
Allowance for purchase and installation of miscellaneous signage.				3,600
Allowance for landowner requests (e.g. fencing and vegetation screening).				45,000
Allowance for additional construction costs. This section of corridor is less accessible from nearby roads than the corridor from Ben Lomond to Black Mountain. This means that more time will be spent hauling material from stockpile sites created where the railway corridor crosses a publicly accessible road. One way to reduce this cost is negotiate access agreements with landholders who adjoin the corridor. Some may be willing to provide access (material can be stockpiled on the railway corridor). An allowance of 5% of construction				431,700

costs has been included to allow for this additional time.				
Allowance for cable locators and traffic management.				36,000
Allowance for adjoining landholder consultation (4 landholders/day).				48,000
<i>Total</i>				<i>9,067,125</i>
Approvals, permits, applications, designs, specifications, assessments (2.5% of maximum estimated expenditure - \$9,067,125).				<i>226,680</i>
Contingency amount (15% of maximum estimated expenditure - \$9,067,125).				<i>1,360,070</i>
Project management (5% of maximum estimated expenditure - \$9,067,125).				<i>453,355</i>
<i>TOTAL (NOT INCLUDING GST)</i>				<i>\$11,107,230</i>

SECTION 7 – AN IMPLEMENTATION PROGRAM

7.1 NSW GOVERNMENT PROCESSES

The NSW Government has set out a number of steps (in public meetings) that proponents need to go through before the development of rail trails can occur (in addition to the necessary legislation to officially close a railway passing Parliament).

These steps appear to include: the preparation of trail feasibility studies and trail development plans (or similar) both of which have been done for this proposed trail; public workshops facilitated by the NSW Government (done for this proposal); a gauge of public support for a rail trail (including but not limited to the public workshops); and agreements with affected adjoining landholders about works that are needed on the trail as it passes their property.

Whilst the NSW Government offered the opportunity for adjoining landholders to nominate issues via the thorough community consultation event it hosted, it is reasonable to state that not all landholders have provided input on the specifics of issues they have (such as location of stock crossings etc). That is one reason why the works tables include allowances for additional landholder requests. This will need to be done at some point before the trail proceeds.

7.2 TRAIL CONSTRUCTION STAGES

Development of trails can often be staged so that parts of trails are developed in line with available funding sources. It is often not possible to open the full length of a trail simultaneously as significant physical, financial, community and institutional work needs to be undertaken. This is the case in many rail trails (and indeed many recreational trails) around Australia. Opening a new trail in stages also allows those who are opposed or undecided about a project to see a clear demonstration of its use and lack of issues (almost inevitably, problems identified by concerned people do not arise).

A staged approach to planning and development is often the best approach as it better suits the capacity of the entity charged with delivering the project.

The proposed New England Rail Trail between Black Mountain and Ben Lomond, passing through Guyra and Llangothlin, is 34 kilometres in length – a good bike ride and a long day's walk (though could be undertaken in two). There is a good argument for completing the trail in one stage.

Rather than undertaking each of the three segments (Black Mountain to Guyra, Guyra to Llangothlin and Llangothlin to Ben Lomond) as discrete segments, it is recommended that each task (such as fencing, trail surfacing etc) be completed before moving on to the next task. That way the entire 34km of trail construction would be completed in its entirety before embellishments such as signage and gating systems are installed.

Once the entire 34km rail trail (Black Mountain to Ben Lomond) is complete, the Councils can then proceed to development of the other remaining stages (Armidale to Black Mountain and Glen Innes to Ben Lomond).

7.3 IMPACTS ON NATIVE VEGETATION

Trail construction will require the removal of vegetation along the length of the former railway corridor. Clearing will be required. Generally speaking, much of the corridor has been kept free of vegetation – in some sections, there has been regrowth though this is not extensive.

The Office of Environment and Heritage (OEH), in partnership with Local Land Services (LLS), manages the implementation of the Native Vegetation Act 2003 and Native Vegetation Regulation 2013.

The Native Vegetation Regulation 2013 makes provision for and with respect to the following:

- ✚ development consent for clearing of native vegetation;
- ✚ the form and content of property vegetation plans (PVPs), the variation and termination of PVPs and a register of PVPs;
- ✚ the assessment of broad scale clearing, including the adoption of an Assessment Methodology for determining whether proposed broad scale clearing will improve or maintain environmental outcomes;
- ✚ clearing for private native forestry;
- ✚ routine agricultural management activities;
- ✚ special provisions for vulnerable land; and
- ✚ miscellaneous and savings and transitional matters.

It is unclear whether the clearing of regrowth vegetation for the purposes of constructing the trail will be required. The Councils will need to liaise with the OEH to determine whether permits will be required and/or whether offset revegetation will be required.

FUTURE STEPS

It is understood that the NSW Government appears to favour an approach where each and every landholder is contacted and talked to on-site (or at least attempts have been made to contact landholders) as part of its consideration of a rail trail (though recent events may indicate a change to this approach). It would seem appropriate to leave this detailed approach to another phase of the project. An allowance for this process is included in all the costs tables in Section 6.

7.4 TRAIL DEVELOPMENT PLANS FOR REMAINING SECTIONS

This trail plan has comprised two components:

- ✚ A commentary on, and a strategic assessment of, the potential for a rail trail on the disused rail corridor between Armidale and Glen Innes.
- ✚ The preparation of a detailed trail development plan for the proposed rail trail along the disused rail corridor between Black Mountain and Ben Lomond (a distance of approximately 34 kms).

The Trail Development Plan for the 34km between Black Mountain and Ben Lomond has been based on detailed notes and measurements made during a complete traverse of that part of this disused railway corridor. As noted earlier, no such traverse and examination was required in this project for the Armidale to Black Mountain (33km) and Glen Inness to Ben Lomond segments (35km).

Therefore, only a rough estimate of works and cost estimates can be provided for these two segments.

In order to produce construction ready works lists and drawings of road crossings and trailheads a traverse of each of these two segments will need to be made. That traverse will reveal the condition of bridges, the location and nature of culverts, the precise location of each remaining railway sign, the condition of fences, and a myriad of other works (similar to the detail contained in the three works list tables already prepared for the 34km between Black Mountain and Ben Lomond).








SECTION 8 – CONSTRUCTION MANAGEMENT

Should the trail proceed, prior to the construction of the rail trail between Black Mountain and Ben Lomond the project manager should prepare a Construction Management Plan (CMP).

The purpose of a Construction Management Plan is to provide a framework reference document detailing how the Council(s) and any contractors will manage and control aspects of the trail construction. The CMP will be used as a working document to ensure that obligations and commitments provided in the relevant licences, permits and approvals are made known to all site personnel and implemented effectively as an integral part of trail construction.

It also aims to detail processes to minimise impacts associated with the construction of the rail trail on adjacent areas. Given sufficient thought and consideration prior to construction, risks can be mitigated, and impacts can be minimised.





To allay the concerns of adjoining landholders during construction the following actions should be taken:

-  Adjoining landowners are to be advised well in advance of construction activity taking place.
-  Construction machinery and contractors' vehicles are not to use private property or private roads to access the former railway corridor (except where permission has been granted). Access should either be along the corridor or adjacent gazetted roads.
-  Fencing needs to be maintained at all times during construction to prevent stock straying.
-  Contractors and Council employees are not to trespass on private property during construction (unless prior written agreement is obtained from the landowner).
-  Spread of weeds along the corridor by construction machinery is to be controlled and minimised. Vehicle and machinery wash down facilities will be needed.
-  Leaving of rubbish within the corridor during/after construction of the trail should not occur.
-  Construction crews should work closely with adjoining landowners over various issues, such as water pipes that cross the corridor, location of stock crossings, new fencing etc.








The general process for the development of the New England Rail Trail will involve the following tasks:

BROAD STAGES OF TRAIL CONSTRUCTION




STAGE 1: PRE-CONSTRUCTION

-  Obtaining all necessary approvals, permits, designs, specifications and environmental assessments.
-  Environmental and other surveys (e.g. flora if required, site pegging and on ground delineation).
-  Notifying key stakeholders and adjoining landowners (government departments, quarry operators etc) well in advance of construction commencing.
-  Ongoing consultation with adjoining landowners to clarify/confirm need for, and precise location of, requested items.





STAGE 2: FIELD IDENTIFICATION WORKS

-  Walking the actual route and marking the actual trail route.
-  Marking trees to be cleared, pruned or left untouched.
-  Removal of cross fences (enables access for machinery to clear vegetation)
-  Clearing regrowth vegetation, and removal of weeds.
-  Identifying and establishing stockpile locations and machinery wash down facilities.
-  Identifying/relocating utilities (if required).
-  Geotechnical/engineering investigations for drainage crossings.

STAGE 3: CLEARING CORRIDOR

-  Removal of steel track and sleepers.
 -  Marking the position of new fences to be installed. 
- Installation of new side fencing and gates (as required)

STAGE 4: DRAINAGE MEASURES

-  Replacement/reinstatement (or removal in some instances) of culverts, bridges and cattle stops.
-  Installing erosion and sediment controls such as silt fences at waterway crossings.
-  Batter treatment (as required).
-  Drainage reinstatement in cuttings and installation of barrier fencing where land slips, rock falls and erosion has occurred.

STAGE 5: TRAIL SURFACING

- ✚ Hauling/stockpiling of trail surfacing (and other) material.
- ✚ Constructing trail (i.e. trail surfacing) and trailhead (compacted gravel is usually recommended for trailheads and rail trail – other surfaces such as bitumen can be considered).

STAGE 6: SIGNAGE AND ROAD CROSSINGS

- ✚ Installing signage (including warning, advisory, trailhead, distance/directional, emergency and interpretive signage) on trail and at trailheads.
- ✚ Installing management access gates, trail user gates and chicanes, stock crossings, cattle grids, bollards and fencing.

STAGE 7: FINAL STEPS

- ✚ Determining locations for (and installing) trailside furniture.
- ✚ Landscaping/revegetation.
- ✚ Cleaning up site.
- ✚ Opening of trail.

When the contractors are removing the track and sleepers, the project manager should ensure that the embankments and cuttings of the former railway are left in an acceptable condition. Furthermore, the contract should ensure that when the track is being removed the contractors should be required to grade and level the embankment/formation following removal of the track.

Care when removing track from the remaining bridges is also critical.

Experience from other rail trails indicates that substantial and at times irretrievable damage to bridges can occur if removal of the track is not done with care and strict supervision.

Similarly, within cuttings care should be taken to ensure drainage is not unduly impacted by careless depositing of ballast to the side of the formation (and thereby filling the side drains).

The project manager should ensure that contractors do not remove any remaining railway signs and signals and switches etc. when moving the steel track and sleepers. These artefacts are one of the reasons that people love rail trails and retention of all these items has been included in the works lists.



Retention of all old distance pegs, and other signage, is strongly recommended.

When using the works tables (Section 6), construction crews should rely on the GPS coordinates rather than the distances as this is a more accurate reading of locations.

Consideration will need to be given to the following matters in the preparation of the CMP:

Landholder Communication Plan

The Council should prepare a Landholder Communication Plan before work commences to ensure that all adjacent landowners are aware of the construction program well in advance and are individually consulted regarding exact placement of recommended works items. This includes the early removal of cross fences (across the railway corridor), replacement of old cattle stops with fences and gates and the installation of new (or repairs to old) side fences.

Safe Work Statement Method (SWMS)

A Safe Work Method Statement (SWMS) documents a process for identifying and controlling health and safety hazards and risks. Under Occupational Health and Safety Regulations, a SWMS must be prepared before high risk construction work begins, if anyone's health and safety is at risk because of the work, but SWMS can be used for any other work activities. A SWMS is designed to help contractors and their employees think through the hazards and risks involved in the work, and to choose effective control measures. As a matter of course, a SWMS will be required and the CMP must address all risks and address how they will be controlled. Matters to be addressed include construction activity at road crossings.

Preparation of Other Works Method Statements

The appropriate environmental authorities (prior to work commencing) may require several other 'Works Method Statements' such as Clearing Work Method Statement, Minor Earth Works Method Statement and Drainage Works Method Statement. These statements will address a range of potential concerns such as the spread of weeds during vegetation clearing (on and offsite), water pollution or sedimentation due to working near to watercourses, and the discovery or impact to any new sites of Aboriginal or non-Aboriginal heritage or archaeological sites.

Environmental and Other Surveys (e.g. flora if required, site pegging and on ground delineation)

Prior to selection of stockpile sites and construction activity, it may be necessary to carry out a variety of environmental and other surveys. The CMP will need to schedule the activity to occur at appropriate times of the year, and prior to construction.

Geotechnical/engineering Investigations for Drainage Crossings

Various investigations may be required at and around watercourses prior to refurbishment / adaptation of the bridges and culverts. The CMP will need to schedule in this activity prior to construction occurring at these sensitive locations.

Utility Identification/Relocation (if required)

Fieldwork did not reveal the existence of utilities (telecom cabling etc) within the corridor (apart from at the major road crossings). However, the CMP should allow for a cable locator to establish the precise locations of utilities and services prior to construction activity (including removal of steel track and sleepers) occurring.

Installation of New Gates and Fences and Stock Crossings

In order to ensure stock are kept out of the rail trail corridor, fencing will need to be repaired or relocated or new fencing erected along parts of the corridor. This activity should be undertaken early in the construction process. Cooperation and consultation with adjoining landowners will be required to ensure any new fencing is installed in the appropriate location and that stock crossings (if any) are located in the optimum locations. Fieldwork revealed numerous locations along the corridor where stock is present. It appears common practice to allow stock from adjacent paddocks to graze within the corridor (presumably with approval and the necessary licence). Stockyards have even been erected within the corridor.

Fencing and Stock Control During Construction

Construction of the rail trail will mean numerous (existing) fences erected across the corridor (particularly at property boundaries and road crossings) will need to be removed. One of the first steps in construction will be to erect new fences and gates (where appropriate) to ensure stock are contained to their paddocks and to ensure construction machinery have unlimited access along the corridor. The CMP will need to program this activity, including the necessary consultation with adjoining landowners and contractors.

Selection of Material Stockpile Sites

Construction of the rail trail will involve the removal of material from the corridor (discarded timber sleepers, steel, old fencing material, miscellaneous waste/rubbish material) and the delivery of materials to be used in the construction of the trail (gravel, fencing materials, bridge components, etc). Numerous stockpile sites will be required along the alignment to enable the management of surfacing material, culvert materials, fill and potentially topsoil and vegetation. Care will need to be taken to ensure the selected sites are safely located, secure, and minimise the invasion of the privacy of neighbours of the proposed rail trail. The stockpile sites should also be located on already cleared sites (minimising the vegetation clearing requirements) and with little or no impact on watercourses or other environmentally sensitive sites. It is imperative that access to the corridor be via public land, unless agreement has been obtained from neighbouring landowners. Preparation of the CMP should address these issues. Given that much of the railway corridor has a road on one or both sides, selection of appropriate stockpile sites should not be a problem.

Construction of Access Points to Corridor

There are roads alongside much of the corridor and occasional roads crossing the corridor. This will facilitate removal of railway track and sleepers and movement of materials along the corridor during construction of the trail itself. However, to gain additional access to the corridor and limit the time and resultant costs of construction, it is proposed that additional access points be developed. The works lists provide for four additional gates and access tracks between Ben Lomond and Llangothlin. This would allow construction access approximately every 2,100 metres. Between Llangothlin and Guyra three additional gates and access tracks are costed, allowing construction access approximately every 2,200 metres. Between Guyra and Black Mountain three new gates and access tracks are recommended resulting in construction access every 2,100 metres. These new access points will be sited off existing public roads and they will consist of a management access gate in the boundary fence and formed access track (built to 5m wide). The precise locations have

not been included within the Plan; spacings are approximate and desirable and precise locations will depend upon having direct access to the railway corridor off an adjoining public road (rather than via an adjoining private property). Upon completion of the trail these additional gates can be used for access by emergency vehicles and maintenance vehicles. They will require identical locking mechanisms to the gates at each road crossing.

Remediation of Contaminants in Sleepers and Along Formation

Although no contamination investigations are known to have been undertaken, it is possible that there are contaminants in the soil and sleepers from years of maintenance of the railway track, railway corridor and associated infrastructure. The CMP should specify how potential contamination is to be dealt with.

De-contamination of Construction Equipment

As good practice, it is imperative that any construction equipment be kept clean. The CMP should specify the process by which construction equipment will be kept clean of potential diseases, weeds and contaminants.

Management of Fire Risk (incl. Spark Control)

There is a risk of accidental fires being caused by sparks from machinery and (in the case of the removal of the steel railway track) the cutting of steel. The CMP will need to address ways of ensuring fires are not inadvertently caused by the construction activity, and consideration given to the time of the year that different construction activities are undertaken. The CMP will identify the general requirements regarding fire prevention and management during construction, especially at times of total fire ban.

Weed Management – Control and Eradication

There is a legal obligation to control noxious weeds. The control/eradication of weeds within the former railway corridor is of particular importance and the CMP will need to ensure that construction of the rail trail does not cause weeds to spread.

Marking Trees for Retention or Removal

In some areas, vegetation has re-grown within the former railway corridor and even between the sleepers of the railway. Clearing of (some of) the regrowth vegetation will be required. However, some of the regrowth should be retained to provide shade for trail users, as it is sufficiently clear of the proposed trail corridor so as to not be of concern. Prior to construction commencing trees that are to be retained (for their shade and aesthetic values) should be marked with flagging tape. The CMP should specify the process for marking trees for retention.

Clearing, Mulching and Disposal of Waste Vegetative Material

Some regrowth vegetation will need to be removed from the rail trail corridor. The CMP will address the process for clearing, and the manner in which vegetative material will be removed from the corridor (such as by mulching and spreading in the immediate area or by other methods).

Disposal, Re-use or Recycling of Sleepers

There may be good quality sleepers available for re-use should they be needed for signage or battering of slopes etc. The remainder can be used for erosion control, or chipped if they are in very poor condition. The CMP should specify where poor sleepers can be used and where the good ones will be used and other methods of disposal.

Erosion Control and Drainage Along Corridor

The railway (when operating) had functional erosion control techniques in place. The construction of the rail trail must ensure that no damage is done to existing drainage channels and erosion control devices and that erosion is mitigated rather than exacerbated. This is particularly important when working in and around the numerous watercourses, along embankments and through cuttings. The CMP will need to address how erosion will be controlled, both during the construction of the rail trail and afterwards.



Side drains in some cuttings have completely disappeared with fill materials washed down from sides of cuttings.

Pollution Control at Watercourses/Bridges

There will be considerable construction activity in the vicinity of watercourses at the time when bridges and culverts are being replaced and/or refurbished. The CMP will need to specify the installation of erosion and sediment controls, such as silt fences, to be deployed at sensitive locations such as bridges and other watercourses. Utmost care needs to be taken to avoid damage to banks of creeks.

Access Considerations

The CMP will need to determine the most efficient means of access to all parts of the corridor (and to stockpile sites), with minimal noise, dust and inconvenience to nearby residents. Given the number of road crossings and presence of parallel roads along the corridor, access should not be an issue.

Traffic Control

There are 8 road crossings along the proposed rail trail. Each road crossing will require various improvements, such as the construction of the trail, the installation of gates and fencing, and the installation of signage. The CMP will need to address the issue of traffic management and control to ensure the safety of contractors involved in construction activity in the vicinity of each road crossing – particularly at major roads such as Ollera St and Sandon St in Guyra.

SECTION 9 – CORRIDOR MANAGEMENT AND OPERATIONS PLAN

9.1 A CORRIDOR MANAGEMENT PLAN

As the trail development planning moves towards completion and the various landowner and development issues are resolved, a number of decisions need to be made about the ongoing management, operation and maintenance of the rail trail.





The best approach to deal with these issues is through a Corridor Management Plan, which forms the basis for ongoing trail management, operation and maintenance. A well-prepared and comprehensive corridor management plan (undertaken in close consultation with the community and neighbouring landowners) serves to ensure the rail trail functions and operates as a high-quality experience.

The initial trail development program may see 34 kilometres of rail trail built (Black Mountain to Ben Lomond) but it is possible that the full 103 kilometres (Armidale to Glen Innes) will be constructed over time.

The following information is provided for information so that each Council can consider a range of factors in managing the trail.

9.1.1 WHAT IS IN A CORRIDOR MANAGEMENT PLAN?


There are four major components to a Corridor Management Plan:

-  A 'Trail Policy' or a set of Guiding Principles which incorporates a set of decisions made about how the rail trail will operate;
-  A Trail Management Plan;
-  An Emergency Response Plan (incorporating a Fire Management Plan); and
-  A Trail Maintenance Plan.

Bringing all four elements together in one framework (a Corridor Management Plan) makes ongoing trail development and management an efficient process and ensures ongoing seamless transitions as personnel involved with the trail change over time. This is very important given that two local governments are involved: Armidale Regional Council and Glen Innes Severn Council.

9.1.2 GUIDING PRINCIPLES

The preparation of a set of overarching principles is a useful exercise. Adherence to these principles will serve as a guide to the use, upgrading, maintenance, promotion and management of the New England Rail Trail. The following principles provide guidance for the two Councils (and have been adopted from several other rail trail projects). The scope of principles indicates the scope of issues considered in the development of the Rail Trail.

-  Access for all - where practical and appropriate, the New England Rail Trail will be developed/upgraded to enable access by as wide a range of potential users as possible including people in wheelchairs, people with disabilities, family groups and the elderly.

- ✚ Providing enhanced outdoor recreational opportunities - the New England Rail Trail will be promoted as an additional component to the range of low cost outdoor recreational opportunities within the New England region.
- ✚ Minimal conflict between trail users – the New England Rail Trail will cater for walkers and cyclists with minimal conflict.
- ✚ Providing access to, and an enhanced understanding of, the natural attributes of the New England region - the New England region has a diverse and outstanding range of physical attributes, and the New England Rail Trail will contribute to the provision of greater opportunities to access these natural features.
- ✚ Providing access to and an enhanced understanding of the history of the New England region - the many physical reminders of past land uses and activities can be a major component of interpretive information available on the New England Rail Trail, and a greater inducement for visitors to use the trail.
- ✚ Quality promotion - the trail manager will give significant emphasis to promoting the New England Rail Trail as part of a broader visitor experience of the region.
- ✚ Effective and ongoing maintenance - the New England Rail Trail will be the subject of a regular maintenance regime, and a detailed audit every 2–3 years, ensuring that all defects along the trail receive quick attention, thereby keeping the trail up to the requisite standard and quality.
- ✚ Quality construction – the New England Rail Trail will be built to appropriate standards, and to a high quality, thereby minimising the need for maintenance, and giving users a quality experience.
- ✚ Quality information, including brochures and mapping - the New England Rail Trail will have quality on-trail information, as well as a professionally produced and widely available trail brochure and map. All means of distribution of trail information need to be utilised, including a web site and social media.
- ✚ Outstanding interpretive material - the New England Rail Trail will have on-trail interpretive material and will be included within other trail and publicity brochures, providing trail users with a greater appreciation of the more interesting features to be found along the trail.
- ✚ Consistency and uniformity of signage - signage is recognised as an essential element of a quality trail, and all signage erected at trailheads, along nearby and adjoining roads and along the New England Rail Trail will conform to accepted standards and will maintain a consistent theme along the entire trail.
- ✚ Adherence to recognised standards - trail construction, signage and trail markers, and trail classification will comply with recognised Australian Standards, thereby ensuring a high quality and safe experience for all trail users.
- ✚ Community involvement – the management and maintenance of New England Rail Trail will consistently seek to involve adjoining landowners and the local community along the corridor on an on-going basis and in the formulation of critical decisions. This on-going involvement with adjoining landowners and the community will ensure that the use of the rail trail does not impinge on private operations and that disputes are resolved wherever possible to the satisfaction of both the trail manager and the

landowner. The on-going involvement with other sectors of the community will ensure that the trail is meeting their expectations.

- ✚ Trail user survey – trail users will be surveyed on a bi-annual basis to ensure the trail is meeting their needs and expectations, and a survey of adjoining landowners and businesses will be undertaken to ensure the trail is meeting their expectations.

Due to the nature of a rail trail (a corridor surrounded by a range of activities), it can be vulnerable to the negative impacts of surrounding development. The Rails-to-Trails Conservancy (USA) suggests that trail planning include the development of a trail protection policy to prevent damage to the trail corridor. The policy sets out primary uses of the corridor – recreation, transportation, and historic preservation. Any use deemed incompatible with this primary use will be denied; those uses compatible with the primary use will be considered and carefully regulated.

A comprehensive trail protection policy provides the trail manager with the authority to do the following:

- ✚ Regulate all secondary uses of the trail corridor in a fair and consistent manner;
- ✚ Minimise inconvenience to trail users, and assure protection of wildlife habitat and natural and historic resources within the trail corridor;
- ✚ Minimise damage to the trail corridor at all times;
- ✚ Establish uniform standards for construction and restoration of the trail corridor if it is damaged by a secondary use;
- ✚ Ensure that the managing agency recovers all its administrative costs and receives appropriate compensation for use of, and damage to, the trail corridor by secondary uses;
- ✚ Inform all public and private interests of the expectations and intentions of the trail managing agency with respect to secondary uses;
- ✚ Issue permits and licences for secondary uses; and
- ✚ Prohibit the transfer of ownership rights through the use of easements or other mechanisms.

9.1.3 THE INITIAL DECISIONS

Some basic initial questions need to be answered, and some crucial decisions made. These inform the management decisions about the ongoing management of the rail trail. The following discussion covers the range of issues generally addressed in trail management. Questions are posed and some possible answers are included. These answers will need to be considered and more fully answered by the Councils. Trailhead Code of Conduct signage should reflect the Councils' position on the following matters.

Enforcement Procedures

What enforcement procedures will be in place? The Councils will have existing local laws covering a range of matters such as riding motorbikes in parks (a common issue). These local laws should form the basis for enforcement – the enforcement infrastructure is the key issue.

Dogs on the Trail

Given the nature of the trail, dogs should be permitted in town areas of the trail only and managed in accordance with relevant local laws.

Weed Eradication and Control

What will be the weed eradication and/or long-term control program? The options are grazing, slashing or using poisons. The Councils will have an obligation to deal with weeds.

Open Fires and Barbecues

Any lighting of open fires or barbecues at any time of the year should not be permitted along the rail trail.

Trail Construction and Infrastructure Standards

This Trail Plan has recommended a range of infrastructure items. This includes the level of development of parking at the trailheads, user information, on-trail signposting, facilities etc. Decisions need to be made as to whether a high or low standard of infrastructure will feature on the trail. This may also include timetables for ongoing enhancements or embellishment of infrastructure. A decision on standards to be adopted on a permanent basis has implications for ongoing trail maintenance.

Strategies for the Protection of Native Vegetation

Together with road reserves, railway reserves played an important role as wildlife corridors and habitats for native birds and animals. In many instances they hold important remnants of the indigenous vegetation that has been all but lost. It is important to manage railway reserves in a manner that maintains and enhances their nature conservation values.

In order to improve aesthetic and nature conservation values, the removal of introduced weeds and grasses and revegetation with native species is desirable. Revegetation is also important in some areas for visitor comfort. Any revegetation areas should be fenced off from stock and planted with native trees, shrubs, herbaceous plants and grasses.

The assistance of dedicated volunteer groups will help ensure that revegetation programs are quickly implemented and successful.

Once the rail trail is developed, the Councils will be responsible for management of revegetation and the control of weeds within the corridor.

Complaints/Communications – Procedures and Responsibilities

It is critically important for the rail trail users, adjoining landholders and the public to have contact with authorities to ensure that the rail trail is managed properly, that maintenance matters are attended to readily, that any regulations are enforced, and that general feedback can be given. It is important that this person or agency is easily contactable. Contact details need to be on all trail literature and maps, on trailhead signage, and on relevant websites.

It is important that the public and users know who to contact about the trail and about management issues. Responsibility rests with an accountable person or group. The Councils need to take responsibility for organising maintenance and for any necessary trail closures and for being the first point of contact for most matters.

On-trail Events and Group Use Policy

One form of group usage is the on-trail special event and how these are to be managed. The Councils should notify, and seek input from, local police and other emergency service personnel when any sizeable event is planned. It builds good community relationships. Major events not involving alcohol may also require assistance from police; for example, police are often involved with events, providing some traffic control services. It is good practice to involve local service personnel in the early stages of event planning.

Target User Groups Need to be Identified

A promotion and marketing plan will need to be included in the set of initial decisions. Tasks will need to be allocated both in the initial stage and in ongoing trail development and operation.

The opening of the rail should be well advertised via local media (TV, radio, newspapers), throughout the New England region and in Sydney and Brisbane. Opening events should be arranged to make potential users well aware of the existence of the new trail.

On-trail Advertising

Will on-trail advertising be allowed? The Councils needs to be aware that advertising can be an advantage to users and commercial operators, it should be controlled, it is a source of funding for ongoing

maintenance/upgrades, it should be to a standard, and style guides should be determined including rail trail logo. On-trail advertising is one avenue of revenue generation. The main impacts of such advertising would be visual impacts and safety impacts. Any permitted advertising signs should not impede trail users nor create a safety hazard (for example, by obscuring a road crossing warning sign). Visual impacts are much more difficult to judge. Local governments have a range of signage policies that are likely to address visual amenity. Policies that regulate road-side

advertising would be the most relevant. Where these are not compatible, the Councils should determine the criteria. On-trail advertising is likely to be directly connected to trail-side businesses (this could be one of the criteria) but the Councils would not be endorsing the service nor directing trail users to that facility under any agreement.



Commercial establishments, such as accommodation providers, alongside the Otago Central Rail Trail in New Zealand are obliged to comply with advertising design guidelines and pay for the advertising.

Use of the Trail Corridor by Utilities

A linear corridor such as a rail trail does lend itself to a range of potential future uses – many of which are not excluded by the possibility of the corridor being converted into a recreation trail. This former railway corridor, like so many others around the world, is also ideally suited for the placement of utilities, such as wires, cables and pipes. Data, telephony and energy can and are all carried in pipes alongside or underneath rail trails. These uses can be complementary to the corridor's use as a recreation trail.

Provided the intended co-use does not disturb the natural, scenic and historical qualities of the trail, it can be permitted in accordance with the Trail Protection Policy (discussed above). In other jurisdictions, utilities are charged an annual fee for corridor use.

Consideration and Amelioration of Impacts on Adjoining Landholders

This covers issues such as fencing, privacy issues, trespassing, the rights to graze the corridor, who will pay for construction works that allow farmers to continue activities etc. The Corridor Management Plan needs to set a basis for how these are dealt with on an on-going basis. One of the guiding principles for the New England Rail Trail should be that the management and maintenance of the trail will consistently seek to involve the local community on an on-going basis and in the formulation of critical decisions. This on-going involvement with adjoining landowners and the community will ensure that the use of the rail trail does not impinge on private operations and that disputes are resolved wherever possible to the satisfaction of both the trail manager and the landowner.

A spirit of cooperation with adjoining landholders needs to be continued throughout the life of the rail trail. Building community support is critical – adjoining landholders can provide a significant boost for wider community support. There are no rules for on-going engagement with adjoining landholders – a willingness to sit down and listen and discuss openly is required. Having a single contact point for the trail would be a significant advantage to ensure ongoing good relationships with landholders. Inviting landowners to 'adopt-the-trail-section' adjacent to their property may be warranted.



The corridor is very wide and open, and decisions will need to be made about how best to maintain the grasses and weeds.

Grazing the "Remnant" Corridor

It is obvious that numerous parts of the corridor are currently grazed. As noted in Section 5.11, grazing the "remnant" corridor not required for the trail has the benefit of reducing maintenance costs for the Councils.

Any capital costs required to install fencing (either permanent or temporary) needs to be offset against a reduction in maintenance costs (notably slashing and weeding) as a result of livestock on the corridor.

Management Structures and Management Planning

Decisions about management structures, timetables for change and the reasons for decisions should also be included in the Corridor Management Plan. Ongoing community involvement which will be driven through the management structures needs to be also included in the Corridor Management Plan – the why, the how and the who need to be clearly articulated in an accessible document.

9.2 A TRAIL MANAGEMENT PLAN

A Trail Management Plan is essential to setting both the long-term and day-to-day management objectives for the trail and provides a framework against which a range of decisions can be made. Such a document - as with all management plans - should be both flexible and responsive to change yet set a clear management framework for future directions and priorities. Trails that do not have a Management Plan suffer from decisions taken on the run, out of context or as knee-jerk responses to critical situations.

Councils may have existing maintenance plans for their path and trail network. The rail trail could be simply added to the list of assets and managed accordingly. The following is provided for information purposes if the two Councils wish to manage the rail trail as a separate type of asset.

The trail manager (Shire of Mundaring) for the Railway Reserves Heritage Trail (RRHT) in Western Australia prepared a Trail Management Plan several years ago. It is a useful model to consider the issues that need to be dealt with by a Trail Management Plan. The issues covered were:

- ✚ Philosophical background to RRHT development;
- ✚ A statement of guiding principles;
- ✚ Review of how RRHT is, and can be further linked to other trails, especially the Munda Biddi Trail, the Bibbulmun Track, the Kep Track, the Farming Heritage Trail and those in the eastern portion of the City of Swan.
- ✚ Clarification of management roles and responsibilities for the various trail sections;
- ✚ Risk management policy;
- ✚ Group and commercial usage policy and guidelines;
- ✚ Provision of essential services for trail users, such as water points, toilets, rubbish bin, lighting and other desirable trail furniture;
- ✚ Identification of any outstanding access /egress works for the RRHT, including disability works;
- ✚ Fire management and emergency evacuation procedures;
- ✚ Preparation of a promotional and interpretation management sub-plans, including specifications for signage and suggestions for interpretation along the trail between the townsites;
- ✚ Mapping and brochures – guiding principles; ✚
- ✚ Formation of a Friends of the RRHT group; and
- ✚ Timetable for reviewing and updating the Management Plan






Some of the initial decisions mentioned above flow into a trail management plan and should be included.

A timetable for reviewing and updating this Plan should be set, with annual reviews and three (or five) year updates recommended. The Plan must outline a professional program of management, designed to ensure that there is no lapse into a belief that trails, once built, will manage themselves.







Further, this plan must clearly define who is responsible for what – it is crucial that everyone knows what their role and responsibility is. Without this, it is all too easy for everyone to sit back expecting someone else to do the work. Trail management plans need to be specific about roles in management and maintenance.




9.3 GENERAL RISK MANAGEMENT

A risk is the chance of something happening as a result of a hazard or threat that will impact on an activity or planned event. Risk arises out of uncertainty. It is measured in terms of the likelihood of it happening and the consequences if it does happen. Risk therefore, even on trails, needs to be managed. Ignoring the risks that apply to a recreation trail or events planned along a trail could impact on:

-  The health and safety of trail users, staff, volunteers and event participants;
-  The reputation, credibility and status of the trail and its manager (or trail association);
-  Public and customer confidence in the trail manager;
-  The trail manager's financial position; and
-  Plant, equipment and the environment.









A systematic approach to managing risk is now regarded as good management practice. Risk management is a process consisting of well-defined steps which, when taken in sequence, support better decision making by contributing to a greater insight into risks and their impacts. It is as much about identifying opportunities as it is about avoiding losses. By adopting effective risk management techniques, the trail manager can help to improve the safety of trail users, the quality of experience for trail users and business performance of the trail organisation. Sound risk management can prevent injuries from occurring and help to reduce insurance claims and costs. Risk management is of particular importance to nature based and adventure tourism operations and requires careful consideration in how it is planned for and dealt with. The courts expect that a business (including local governments) will exercise due diligence in carrying out hazard assessment, risk management planning and emergency response planning. There are many benefits in implementing risk management procedures. Some of these include:

-  More effective strategic planning;
-  Better cost control;
-  Increased knowledge and understanding of exposure to risk;
-  A systematic, well-informed and thorough method of decision making;
-  Increased preparedness for outside review;
-  Minimised disruptions;

-  Better utilisation of resources;
-  Strengthening culture for continued improvement; and
-  Creating a best practice and quality organisation.

Though the rail trail would be located on a reasonably flat grade, and is wide enough to accommodate several user groups, there will be risks associated with use of the trail.

Some of the risks involved are:

-  Encountering motor vehicles at road crossings;
-  Conflict between user groups;
-  Encountering illegal trail users such as cars/4WD and trail bikes;
-  Falling from unprotected bridge crossings (though handrails on all bridges over 1 metre high would be required);
-  Falling from high embankments, where there are no barriers;
-  Being caught in a grass fire;
-  Being caught in a flood; and
-  Being bitten by a snake.










Good design and construction address some of these risk elements. Many trail projects have in place a maintenance plan which sets out clearly the items which require regular inspection, the frequency of that inspection and assessment, the actions to take in response to degraded surface conditions or infrastructure, and remedial action to rectify a problem or fault.

The threat of fires is always present. Though snakes are rarely encountered, it may be prudent for trail promotional material to carry a warning about possible encounters and to provide information about dealing with a snakebite.

9.4 AN EMERGENCY RESPONSE PLAN

Major fire events throughout Australia in recent years have put the need for emergency planning and management into sharp focus. Trail managers need to be very conscious of the need to prepare emergency response plans and work out how to deal with emergencies on trails. This is not limited to fires. Flooding can be just as serious an issue.




The key elements of an emergency response plan for a rail trail such as this are:

-  General risk management;
-  Fire risk and fire management;
-  Flood risk and evacuation procedures;
-  The provision of appropriate signage;
-  Trail access for emergency service vehicles;
-  Emergency responses – how and who;
-  The provision of adequate information and mapping to the services' communications centres;
-  The need for special agreements between emergency service providers and the trail manager; and
-  The provision of on-trail communication systems.





9.4.1 FIRE RISK AND MANAGEMENT

The trail manager will be responsible for implementing fire protection and management along the rail trail corridor to protect life, property, public assets and natural and cultural values from fire, reduce the incidence of fire, reduce the severity and restrict the spread of fire. The aim of fire management is to ensure trail users and adjoining landholders are protected from fire commencing on or travelling along the rail trail corridor. To reduce the incidence of fire starting from the rail trail all open or solid fuel fires should be prohibited. At visitor facilities, such as trailheads, picnic shelters and rest areas, slashing should be used to reduce fuel loads. Where the corridor has tree cover or where revegetation is to occur, there will be a need to provide a buffer zone along the boundary or alternatively seasonal grazing of the vegetated area to reduce fuel loads will be permitted. Relevant signage at trailheads needs to include fire warnings.

Fire management issues include:




-  Fire risk factors in the area – risk profile is influenced by a number of factors including slope of the land (hilly terrain and north and west facing slopes increase risk), response time for emergency vehicles (the closer to a town a trail location, the less time for emergency vehicles to get there), proximity of roads and how heavily trafficked they are (highways and major arterials increase risk due to higher numbers of passing motorists), and closeness of refuges including fire-proof buildings and roads.
-  Fire management responses for the trail. These included closure on days of total fire ban (and consequent policing). This is now done regularly in National Parks throughout Australia and on recreational trails. Mapping technology may be available that provides good indicators as to fire paths which would allow parts of the trail to be ranked in terms of fire risk (recognising that nothing can be absolutely precise). Possible management responses in zones of highest fire risk may include appropriate warnings, and possible longer closures on these sections (rather than just on days of total fire bans). Sections of trail in zones of lower fire risk could have a lower level of fire management response.
-  The banning of smoking on the rail trail under legislation governing smoking in outdoor areas. It is acknowledged that this is difficult to enforce except by having a constant presence; it is however a possible ‘tool in the toolbox’ for managing fire risk.

It is of major importance to develop a Bush Fire Risk Management Plan early in the planning process in consultation with the NSW Rural Fire Service. This is an issue with many rail trails (and in fact with any activity that takes people out into the bush in significant numbers). It has been successfully tackled elsewhere. For example, the Lilydale to Warburton Rail Trail (in Victoria) has developed a Wildfire Risk Management Plan. The Plan includes a number of objectives and relevant actions. The objectives are:

-  Providing a safe recreation trail for walkers, cyclists and horse riding;
-  Providing a safe access onto and along the trail for all emergency vehicles;
-  Minimising the risks of fires spreading from or onto the rail trail; and
-  Developing annual maintenance works and maintenance programs (with an accent on fire hazard reduction).

9.4.2 FLOOD RISK

Flood issues include:

-  Need for safe crossing of all waterways;
-  Closing the trail, or sections of the trail, at times of flooding (or immediately after heavy rains when the trail surface may be impacted by trail users); and
-  Evacuation procedures when trail users are inadvertently caught on the trail during a sudden flood event.

9.4.3 APPROPRIATE SIGNAGE

Trailhead signage should specify what to do in an emergency, the numbers to call, the location of public phones, and the capacity for a flip-down sign indicating trail closure (due primarily to fire, flooding or maintenance work).

Many trails, including rail trails, are now using Emergency Marker signage placed at regular intervals along the trail and at road crossings. Section 5 examines two options for emergency markers.

The Emergency Marker system generally uses a unique alpha-numeric code for each location. The trail would have a series of consecutively numbered sign posts. The signs contain not just the unique alpha-numeric identifier, but also the Emergency telephone number to call for help. Emergency Service operators are aware of the location of each uniquely identified sign and can send help to that specific location in an emergency.

9.4.4 TRAIL ACCESS FOR EMERGENCY VEHICLES

The main design element is that emergency vehicles will need to have access to the rail trail. The simplest option is to ensure that all locked management gates along the trail (such as recommended for all road crossings) and alongside adjoining roads have the same locking system, either key or combination locks. The preferred option is a combination lock. A single combination for an entire trail is recommended; this can be registered with the communications centres of each of the emergency services, which dispatch vehicles to emergencies.

9.4.5 EMERGENCY RESPONSES – WHO AND HOW?

In an emergency situation, one of the key issues that arise is how an emergency is communicated. The emergency number from a landline is 000, while the emergency number that works best from a mobile phone is 112. Once a call is made by a trail user, the

communications centre for the appropriate service dispatches the required personnel and vehicles. The trail manager would only likely to be involved after the emergency situation is resolved, to review and record the incident, and to review the response.

It is a different situation when the emergency is a slowly emerging situation, such as a period of total fire ban (or very high fire risk) or the likelihood of flooding. The trail manager needs the vested authority to close the trail under such circumstances (under relevant state government legislation). Once the trail manager advises police that the trail (or part of the trail) is closed, police have the powers to ensure that people do not go onto the trail or can be removed from the trail if they are on it (an administrative trespass) though most people accept the advice of police. In an emergency such as a fire or flood (as opposed to trail closure because of a fire risk for example), emergency services have 'command and control' powers that allow them to remove people from a situation considered to be dangerous. In such circumstances, emergency service personnel are 'out and about' and see people and move them to an appropriate place.

At times when the trail needs to be closed (such as a very high fire risk or when flooding of watercourses is present), police would be able to travel to trailheads in their area and 'flip down' the Trail Closed sign.

9.4.5 PROVISION OF ADEQUATE INFORMATION FOR COMMUNICATIONS CENTRES

As the trail develops, mapping data should be provided to the communications centres for each of the emergency services. The data that should be entered into their system covers maps with the location of Emergency Markers, trail distance markers (and their reference points), and road crossings (and their GPS coordinates) marked on the maps. One set of data should be developed and given to all the communications centres.

9.4.6 SPECIAL AGREEMENTS

There is usually no need for special formal arrangements between the trail manager and the emergency services for a trail. It is a resource and an activity that the emergency services need to deal with as part of their everyday activities. Any major events on the trail should trigger early involvement by police and ambulance in particular – this is good practice and ensures good relationships.

9.4.7 ON-TRAIL COMMUNICATIONS SYSTEMS

The placement of emergency phones on the trail as a way of ensuring that emergencies could be managed could be considered. However, this is a significant cost item to install, replace and maintain. In addition, most trail users would have some form of mobile phone. In addition, placing phones on the trail possibly increases the trail manager's liability – if a phone does not work (for instance it is broken), an aggrieved person may look for recompense from the trail manager. Public phones are often quite accessible from trailheads and their locations should be shown on all trail mapping (brochures, trailheads, Web sites etc.).

9.5 A TRAIL MAINTENANCE PLAN

9.5.1 INTRODUCTION

Ongoing trail maintenance is a crucial component of an effective management program – yet it is often neglected until too late. Countless quality trails have literally disappeared because no one planned a maintenance program and no one wanted to fund even essential ongoing repairs. It is therefore essential that funds be set aside in yearly budgets for maintenance of this trail - to ensure user safety and enjoyment, and to minimise liability risks for land managers.

9.5.2 THE MAINTENANCE TASK

Ongoing maintenance can be minimised by building a trail well in the first place. A well-constructed trail surface will last considerably longer than a poorly built trail. Signs, gates, and posts installed in substantial footings stand less risk of being stolen or damaged. Well designed, well-built and well installed management access gates and trail user gates (as proposed) will keep motor vehicles and motorised trail bikes off the trail with a consequent lessened need for surface repairs. Trail furniture (such as bench seats, trail directional marker posts and interpretation) should be installed in substantial footings sufficient to withstand high winds and theft. These should require minimal ongoing maintenance. Care needs to be taken by maintenance vehicles when travelling along the trail so as not to damage the surface.



Trail managers and “Friends of...” groups often arrange ‘Adopt-a-Trail’ programs to ensure the rail trail is well maintained – by volunteers. The majority of some trails, such as the Bibbulmun Track, is maintained by volunteers.

The presence of trees along some of the trail means that time will be spent removing damaged and fallen trees and branches in the aftermath of a storm.

The most frequent maintenance task will be attending to fallen branches and limbs, repairing trail surfaces, replacing stolen or damaged signs (including road signs), clearing culverts and under bridges and ensuring gates and fences are functioning as intended.

As noted above, building good trails in the first place is the very best way of minimising future problems and costs. As a second line of defence, a clear and concise Management Plan with a regular maintenance program written into it will aid significantly in managing ongoing resource demands.

The goals of a Trail Maintenance Plan are to:

- ✚ Ensure that trail users continue to experience safe and enjoyable conditions;
- ✚ Guard against the deterioration of trail infrastructure, thereby maintaining the investment made on behalf of the community;
- ✚ Minimise the trail manager's exposure to potential public liability claims arising from incidents which may occur along the trail; and
- ✚ Set in place a management process to cover most foreseeable risks.

Erosion (caused by weather and unauthorised users), regrowth of vegetation (including grass and weeds on the trail corridor but not on the trail surface), fallen trees and branches, and damage to signage and fences are likely to be the greatest maintenance activities on the trail. Providing these effects are attended to early, they are largely labour intensive rather than capital expensive. Calamitous events such as fire or major flood will naturally generate significant rebuilding activity and consequent costs. These events are generally unmanageable and should simply be accepted as part of the longer-term reality of trail management.

9.5.3 PUBLIC LIABILITY AND RISK MANAGEMENT

It is important that both the Armidale Regional Council and the Glen Innes Severn Council be aware that – whether or not visitors are actively encouraged to come to the trail – they carry a significant duty of care towards those visitors accessing the trail. The maintenance of a quality trail is therefore critical from this perspective. Liability generally rests with the land managers and hence, every attempt should be made to minimise the risk of accident or injury to trail users (and therefore the risk of legal action).

While public liability is certainly an issue for all land managers, it is not a reason to turn away from providing safe, sustainable and enjoyable resources. It is simply a mechanism by which to recognise the responsibilities inherent in managing natural and built resources. Dealing with a perceived liability threat is not about totally removing that threat – it is about doing all that is manifestly possible to provide safe access opportunities for visitors, thereby minimising the risk of liability claims.

A formal Hazard Inspection process is crucial in the ongoing maintenance plan. Not only will this define maintenance required and/or management decisions to be addressed, it is vital in ensuring safe conditions and therefore in dealing with any liability claim which may arise in the future. Courts are strongly swayed by evidence of a clear and functional program, and a regular series of reports, with follow-up actions, will go a long way to mitigating responsibility for injuries. Further, clearly defined 'User Responsibility' statements in brochures, maps, policy documents, plans and public places will assist this process.

9.5.4 TRAIL MAINTENANCE

The following information is provided as general maintenance guidance. An inventory of works and locations needs to be prepared for maintenance purposes – this cannot be prepared until construction is completed. An example of a checklist for a trail is included in Appendix 4. The Councils will need to create a specific checklist based on this example once the trail is completed.

Maintenance on the trail should be divided between regular inspections and simple repairs, a one (or two) person job, and quarterly programs undertaking larger jobs such as significant signage repairs or weed / vegetation control. A range of basic machinery, tools and equipment will be required for this work.

At the core of any trail maintenance program is an inspection program. The relevant Australian Standards sets out the basis for frequency of trail inspections. It only covers walking tracks and provides for inspections every 30 days (or less) for Class 1 trails, every 90 days for Class 2 trails, and annually for Class 3-6 trails. This sets the minimum standard for inspections and is a guide only. What the Australian Standards do not include but should include is an inspection of any trail after significant weather events such as storms, fire, floods, and high winds in addition to the regular inspection program. The proposed inspection regime recommends inspections every 90 days.

Clear records of each activity/inspection will be kept by the body with responsibility for maintenance. Pro-formas serve to maximise user safety and minimise liability risks. It will also provide a valuable record of works undertaken and make for efficient use of maintenance resources over time.



Volunteers organised by the Committee of Management at a busy bee to undertake maintenance work along the rail trail near Port Fairy in Victoria.

In general, Maintenance Plans are based around regular inspections, at which time simple maintenance activities should take place concurrently. More time-consuming maintenance activities should take place every six months, while detailed Hazard Inspections should occur annually. Further, the capacity to respond immediately to random incoming reports of hazards or major infrastructure failures should be built into the Plans. Table 17 gives a suggested schedule for general maintenance activities to achieve acceptable maintenance levels and provides explanatory notes pertaining to each Activity.

Table 17: General Maintenance Activities

Activity	Activity Description	Site	Frequency
Undertake full inspection of the trail.	<p><i>At Trailheads</i></p> <p>The trailhead should be carefully checked to ensure that all signage is present, and that all signs are clearly visible and legible. An inventory needs to be prepared to assist in regular maintenance.</p> <p>Surface of access tracks and parking areas need to be checked and potholes eliminated.</p> <p>Inspect and check trailhead facilities and infrastructure:</p> <ul style="list-style-type: none"> ○ Parking areas and access tracks (check surfaces) ○ Trailhead (map) panel ○ interpretive panel ○ Seating/shelter/picnic tables ○ Trailhead signage (on road) ○ Trail directional marker posts <p><i>At Road Crossings</i></p> <p>Particular attention needs to be given to signs at road crossings or junctions. Each crossing should be carefully checked to ensure that all signage is present, and that all signs are clearly visible. Particular attention must be given to ensuring that “Trail Crossing ahead” signs (on roadside at approach to trail crossing) are not obscured by overhanging vegetation.</p> <p>Replace damaged and/or missing signs.</p> <p>Check management access gates and trail user chicanes for structural stability and function.</p>	Entire trail	Every third month

	<p><i>Fencing</i></p> <p>Check and make repairs to side fencing. To be done by arrangement with adjoining landowners.</p>		
<p>Check signage and clean, replace or repair as required esp. road crossing signage and directional markers.</p> <p>All signage should be checked for vandalism and cleaned if necessary. If damage is too great, replacement is essential.</p> <p>An inventory of locations of all signs needs to be prepared to assist in regular maintenance.</p> <p>Slashing of trail environs.</p>	<p>Check, repair or replace all trail signage, including interpretive signage, trail distance and directional markers (logo/arrow plates). Replace missing and/or damaged signs.</p>	<p>All locations</p>	<p>Every third month - at each trail inspection.</p>
		<p>Various locations</p>	<p>Timing dependent on seasonal growth patterns. Allowance for up to 5 or 6 times per year.</p>
<p>Check trail surface and arrange repair as required.</p>		<p>Entire trail</p>	<p>Every third month. Arrange repairs immediately if acute, or schedule maintenance for six monthly work sessions if not.</p>
<p>Maintenance of trail surface.</p>	<p>Check condition of trail surface for damage and arrange repairs if necessary; trim off regrowth vegetation.</p>	<p>Entire trail</p>	<p>Every six months.</p>

Sweep or rake debris from trail surfaces, especially at road crossing points.		Various locations	Every six months.
Maintenance of culverts and other drainage measures.	<p>Check and clear drains and culverts.</p> <p>Drains need to be checked and cleared once or twice/year and after heavy rainfall events. Regular maintenance especially after heavy rainfall is essential. Most maintenance will involve clearing of material from silted up or blocked drains.</p> <p>Drain blockages should be cleared as urgent priority.</p> <p>Silt traps at culvert discharges or entry points should be cleared regularly.</p> <p>Cess drains in cuttings should be checked to ensure they function effectively.</p>	Entire trail	Every six months.
Cut back regrowth, intruding and overhanging vegetation.	<p>Check overhanging or intruding vegetation. Cut back where required. Clear fallen trees and branches.</p> <p>Undergrowth vegetation grows quickly, and over time will continue to intrude into the trail 'corridor'. Such intruding vegetation needs to be cut back to provide clear and safe passage for trail users.</p> <p>"Blow-downs" - trees or limbs that have fallen across the trail – need to be cleared as/when required. Sight lines must be kept clear either side of road crossings, to ensure that users can clearly see a safe distance either way at road crossings.</p>	Entire trail	Every six months, unless obviously requiring attention at regular inspections.
Check structural stability of interpretive signage, and interpretive shelters.	Interpretive panels should be checked for vandalism and cleaned if necessary. If damage is too great, replacement is essential. An inventory of locations needs to be prepared to assist in regular maintenance.	Entire trail	Every six months.

Check structural stability of seating, distance posts. Inspect and replace when needed.	Furniture alongside trails, if installed, needs to be checked regularly for damage to ensure safety and comfort of trail users.		
Undertake Hazard Inspection and prepare Hazard Inspection Report.	This should be done annually. Inclusion of a formal Hazard Inspection process, crucial in addressing risk, is necessary in the ongoing maintenance plan. Not only will this define maintenance required and/or management decisions to be addressed, it is vital in ensuring safe conditions and therefore in dealing with any liability claim which may arise in the future. Courts are strongly swayed by evidence of a clear and functional program, and a regular series of reports, with follow-up actions, will go a long way to mitigating responsibility for injuries. Further, clearly defined 'User Responsibility' statements in brochures, maps, policy documents, plans and public places will assist this process.	Entire trail	Annually.
Check structural integrity of bridges. Inspect and maintain bridges. Check for obstructions and clearing under bridges.	Visual inspection is appropriate though detailed inspection should follow storm and flood events. After floods, bridge should be inspected, and damaged components replaced as soon as possible. Handrails and surface decking on bridge should be inspected for damage at regular intervals.		Annually.

It should be noted that this schedule does not allow for repair works above and beyond 'normal' minor activities. For example, if a section is subject to heavy rain, and erosion control fails, additional repair works will need to be undertaken).

9.5.5 MAINTENANCE COSTS

Resourcing a maintenance program is crucial, and funds will be required on an ongoing basis to enable this essential maintenance. It would be short sighted to go ahead and build the New England Rail Trail and then baulk at the demands of managing and maintaining it.

Estimating the cost of maintaining a trail is difficult due to the unpredictability of events such as floods, fires, high winds and stormwater runoff, as well as the tenure and management arrangements for the trail. Deliberate and wilful damage and vandalism can also contribute significantly to the need for ongoing maintenance and replacement of infrastructure.

Volunteers can be organised (through a coordinated program) to carry out much of the work at a limited cost to the trail manager.

Evidence of actual trail maintenance costs for individual items along a rail trail, or any trail for that matter, are scarce. The Rail to Trails Conservancy in the USA (*Rail-Trail Maintenance and Operation – Ensuring the Future of Your Trails – A Survey of 100 Rail-Trails, July 2005*) provides two general answers for why it is difficult to estimate maintenance costs. First, the trail may be part of a larger budget for a single park or even an entire parks and recreation department. Specific costs for the trail aren't separated out. Second, small trail groups, though run by competent and extremely dedicated volunteers, tend to be 'seat-of-the-pants' operations. Maintenance is done "as needed," funds are raised "as needed," and the people are volunteering because they love the trail, not because they love doing administrative tasks like budgeting.

Maintenance responsibility does appear to significantly affect cost. Approximately 60% of the surveyed trails reporting costs were maintained primarily by a government agency, implying paid staff and/or contractors. The other 40% of trails were primarily maintained by a non-profit or volunteer organisation. Annual costs for government-run trails were just over \$2,000 per mile (\$1,250/km). This is not much more than the overall average of \$1,500/mile (\$940/km), but it nearly triples the average for volunteer-run trails of just under \$700 per mile (\$440/km). (Note: these are US dollars).

In Victoria, the Murrindindi Shire Council manages and maintains approximately 85% of the (134km) Great Victorian Rail Trail. It spends around \$2,000/km on maintenance activities each year which the trail manager believes is insufficient. Anecdotal information indicates that initial construction issues necessitate an increased level of maintenance of the trail surface (and drainage through cuttings). A higher level of (initial) construction quality (i.e. better trail surfacing) would mean less ongoing maintenance.

Volunteers could undertake much of the ongoing maintenance of the trail if a volunteer maintenance program is arranged. It should be ensured that whoever is charged with ongoing responsibility for managing the trails has genuine and specific trail knowledge. It is not sufficient to be a skilled gardener, conservationist or environmental scientist. If training is required to bring staff knowledge levels up to a high standard, this should be seen as a priority to be undertaken early in the construction process. Trail skills are better learned over a longer time, with hands-on practice, than in short briefing sessions.

The biggest maintenance costs involved are obviously maintenance of the items that initially cost the most to install – surfacing and bridges.

It is difficult estimating the costs involved in maintaining a trail until every last bridge and other infrastructure items have been installed.

As stated earlier, ongoing maintenance can be minimised by building a trail well in the first place. This means the better the initial trail surface, the lower will be the ongoing maintenance of that trail surface. A similar situation applies to bridges. Re-constructed and refurbished bridges will require little or no maintenance for many years. However, after perhaps a decade of use they will require more and more maintenance of decking timbers (if used) and more scrutiny of fixings (depending on what materials are used for decking).

The use of volunteers to undertake many of the routine repairs and cleaning tasks can substantially reduce the costs.

9.5.6 ESTIMATE OF MAINTENANCE COSTS FOR BLACK MOUNTAIN TO BEN LOMOND

Table 18 makes an attempt at estimating an amount that may be required on an annual basis for maintaining the proposed 34km New England Rail Trail from Black Mountain to Ben Lomond. An estimate based on extrapolating these costs to the remaining sections (Armidale to Black Mountain and Ben Lomond to Glen Innes) follows.

Table 18: Estimate of Maintenance Costs for Black Mountain to Ben Lomond – 34km

<i>Task</i>	<i>Frequency/note</i>	<i>Possible costs</i>
Inspect and check trailhead facilities and infrastructure (Black Mountain, Guyra, Ben Lomond): <ul style="list-style-type: none"> - parking areas (check surfaces) - interpretive panel - picnic tables - trailhead signage (on road) - trailhead (map) panel - trail directional marker posts 	3 trailheads at average repairs of \$1,000 per site/year	\$3,000
Trail surface - allowance for incidental repairs to, and upgrading of, trail surface.	Allowance of 2% of replacement cost (i.e. 2% of \$2,254,100).	\$45,100
Check side vegetation growth and overhead vegetation and cut back where required. Clearing of fallen trees and branches.	Allowance of 10 person days per year (@ \$500/day).	\$5,000
Slash corridor both sides of trail to reduce weeds and fire load/risk. (See Note 1)	Allowance for 80% corridor, both sides of trail (= 54km) (@ \$100/hr). Corridor slashed 6 times a year.	\$10,800

Inspection and routine maintenance of bridges. Check for obstructions and clearing under bridges. (See Note 2)		\$2,000
Check and clear culverts.	Allowance of 20 hours for checking and cleaning	\$1,600
Check road crossings. Replace damaged and/or missing signs and undertake other tasks: <ul style="list-style-type: none"> - Give Way Road Ahead signs - Trail Crossing warning signs - Road name signs - Regulatory signs - Check sight distances and clear vegetation if necessary 	8 crossings at average repairs of \$500 per crossing/year	\$4,000
Allowance for replacement of trail directional marker logo/arrow plates and trail kilometre posts.	10 replacements per year	\$4,000
Allowance for repairs to trailside furniture and occasional replacements (when required).	Inspection and minor repairs every 6 months. 1 replacement per year.	\$2,000
Check miscellaneous signs along trail (e.g. Road Ahead, Give Way, trail name, distance signs, "No Trespassing", bridge load signs, etc).	10 replacements per year.	\$2,000
Check management access gates and fences at road crossings. Make repairs where necessary.	Allowance of \$8,000 per year for repairs.	\$8,000
Check interpretation along trail for damage and structural stability.	Allowance for replacement of 1 panel per year.	\$3,000
Inspection of rail trail (3 times/year). (See Note 3)	Allowance for 3 inspection trips per year	\$4,500
Preparation of annual Hazard Inspection Report.	1 person days @ \$1000/day.	\$1,000
\$96,000 excl GST (per annum)		

This equates to a rate of approximately **\$2,820 per kilometre per annum.**

Note 1: The necessity to slash could be much reduced if the rail trail is located within a narrower, fenced corridor and adjoining landowners graze stock within that part of the corridor deemed 'surplus to requirements'. Slashing costs are based on Option 1 (discussed in Section 5.1.1) whereby the corridor is fully fenced (resulting in a 6m wide railway). Any other options will mean higher maintenance costs.

Note 2: Few bridges are located between Black Mountain and Ben Lomond.

Note 3: Reporting of routine maintenance requirements by trail users will obviate need for many scheduled inspections. Appointment of a Trail Manager, with responsibility for regular inspections of entire trail, will substantially reduce need for unscheduled and expensive maintenance.

9.5.7 ESTIMATE OF MAINTENANCE COSTS FOR ARMIDALE TO BLACK MOUNTAIN AND BEN LOMOND TO GLEN INNES

The preparation of a maintenance plan for the Black Mountain to Ben Lomond section of trail is reasonably straightforward, despite the trail not being built. The details of the corridor are known because every metre of the corridor has been traversed. Based on this traverse, the trail development plan has itemised where every known sign, culvert, bridge and gating system is located.

The preparation of a maintenance program and schedule for the other sections of the proposed rail trail (i.e. between Armidale and Black Mountain and between Glen Innes and Ben Lomond) is more difficult given that a detailed trail development plan has not been prepared for either section. The consultants have not been commissioned to traverse those sections of corridor. Rather, an overall impression of those two sections has been gained by inspection of the former railway corridor from road crossings, adjoining roads (using binoculars) and from short walks along discrete sections of the corridor. Unfortunately, some lengthy sections of each section are not able to be observed as they are remote from nearby roads.

Nevertheless, some estimates of the maintenance requirements can be made based on the general observations made of the corridor, its characteristics and the infrastructure as observed.

The section of disused railway corridor between Ben Lomond and Glen Innes contains more bridges than between Armidale and Ben Lomond. There are several lengthy bridges, and the condition of the structures varies considerably.

When these two sections of rail trail are built (Armidale to Black Mountain and Glen Innes to Ben Lomond) the bridges will be completely re-furbished, so they are suitable for trail users and maintenance vehicles. They will not require ongoing maintenance expenditure for many years, other than perhaps inspections and the occasional replacement of signage. An allowance of 10% more per annum for these two sections (to account for unknown conditions and/or more bridges) has been made. The rate calculated for the Black Mountain to Ben Lomond section - \$2,820/kilometre - has been used with an extra allowance of 10% added to give a per kilometre rate of \$3,130.

Therefore, estimated maintenance costs for Armidale to Black Mountain (33km) are \$103,290 and for Ben Lomond to Glen Innes (35km) are \$109,500.

Again, it must be stressed that these are estimates only and they are not based on the results of a detailed assessment of the corridor as a traverse has not been undertaken. It should also be noted that the trail segments have not been constructed and therefore it is not known to what standard any component of the trail will be built.

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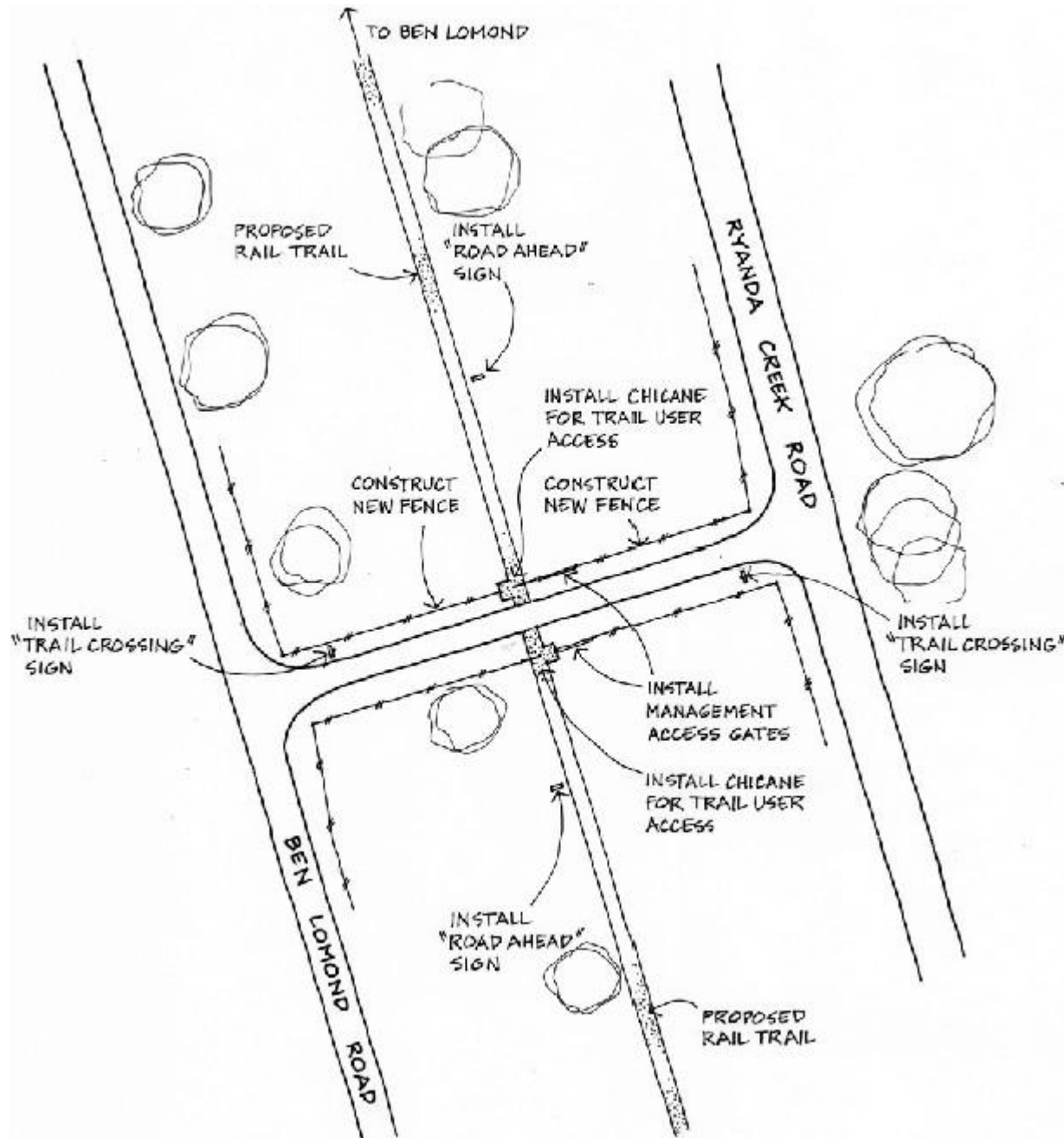
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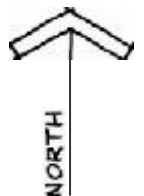
APPENDIX 1: ROAD CROSSING DRAWINGS

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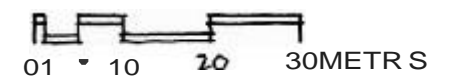
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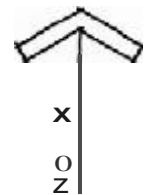
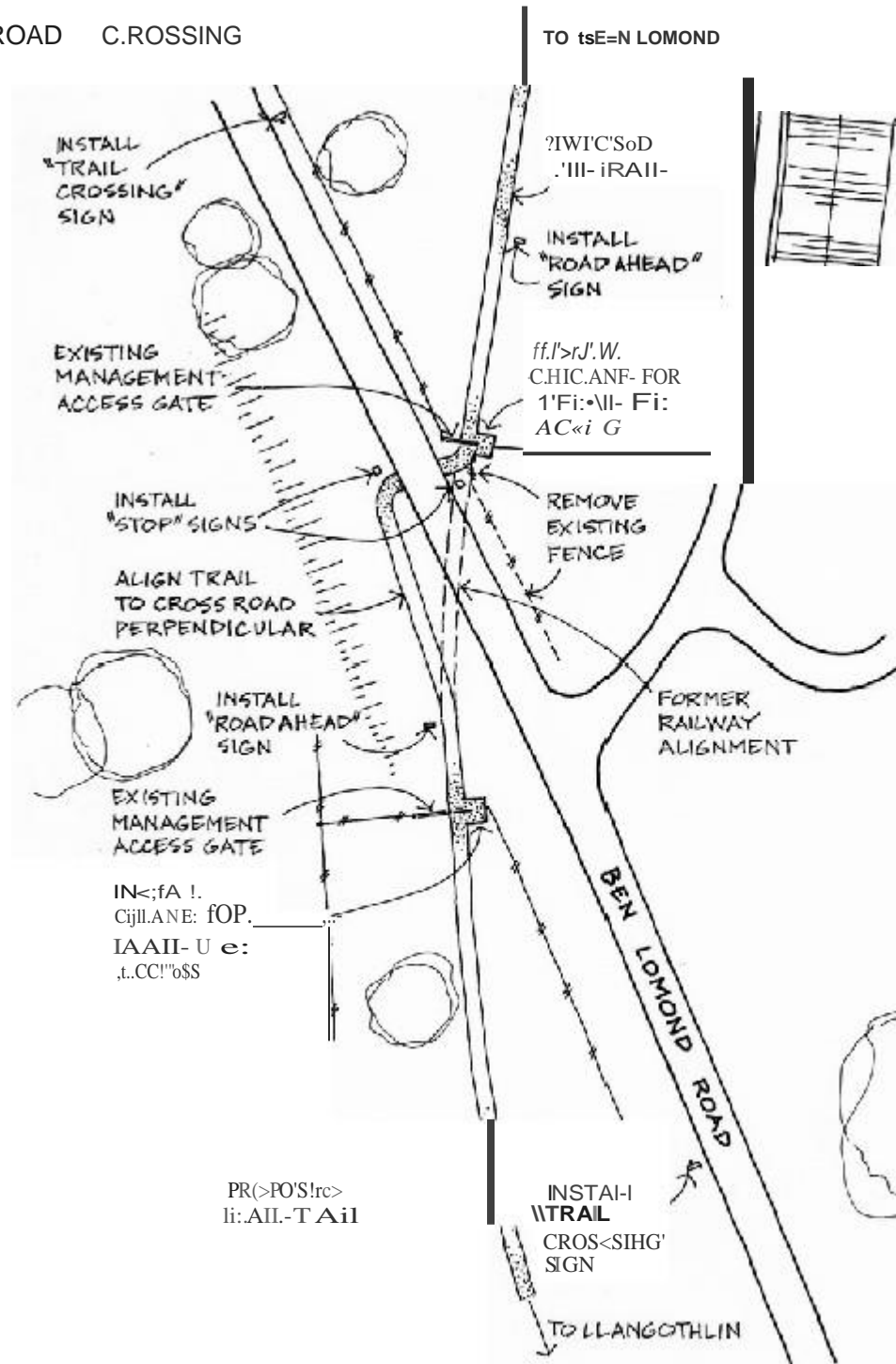
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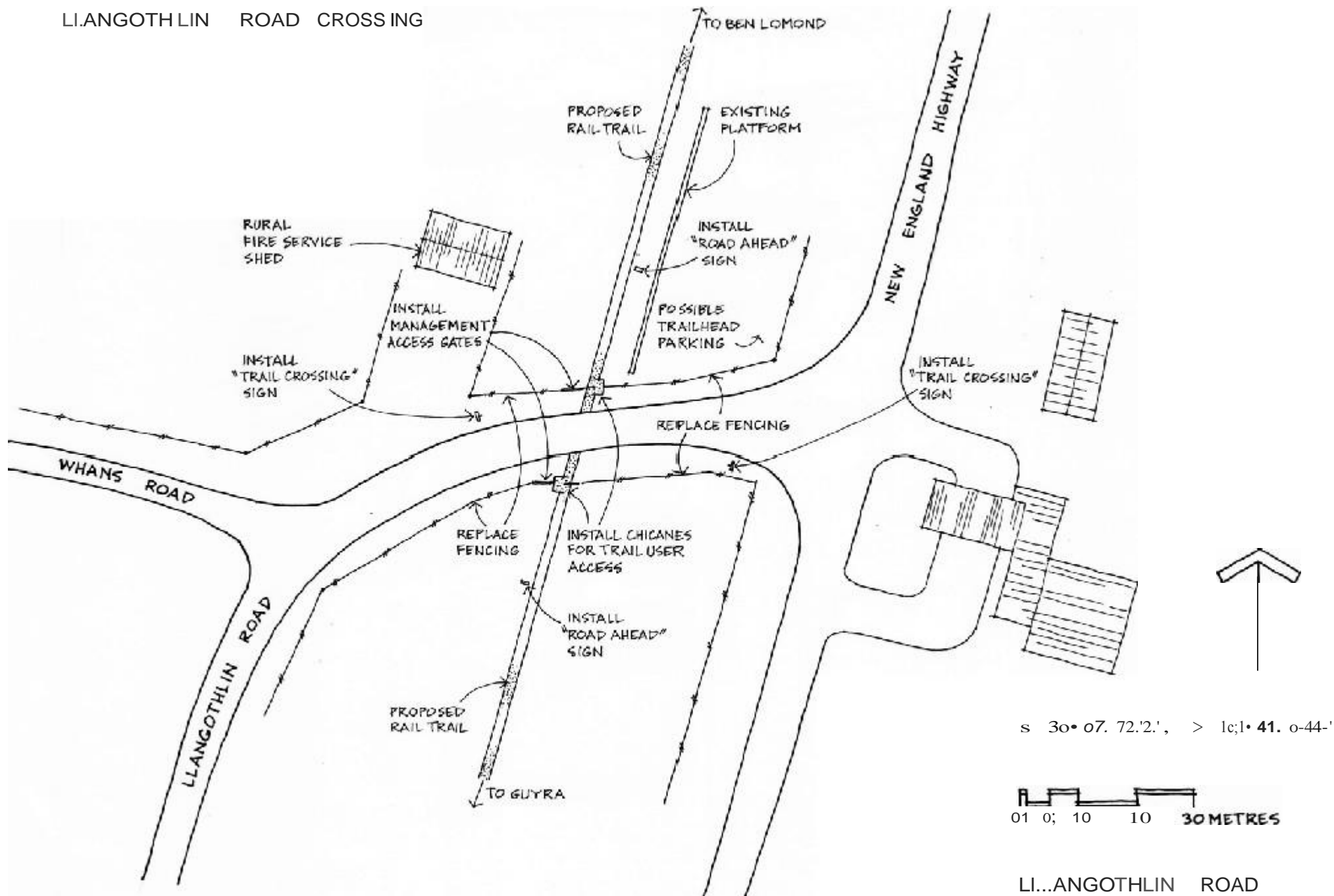
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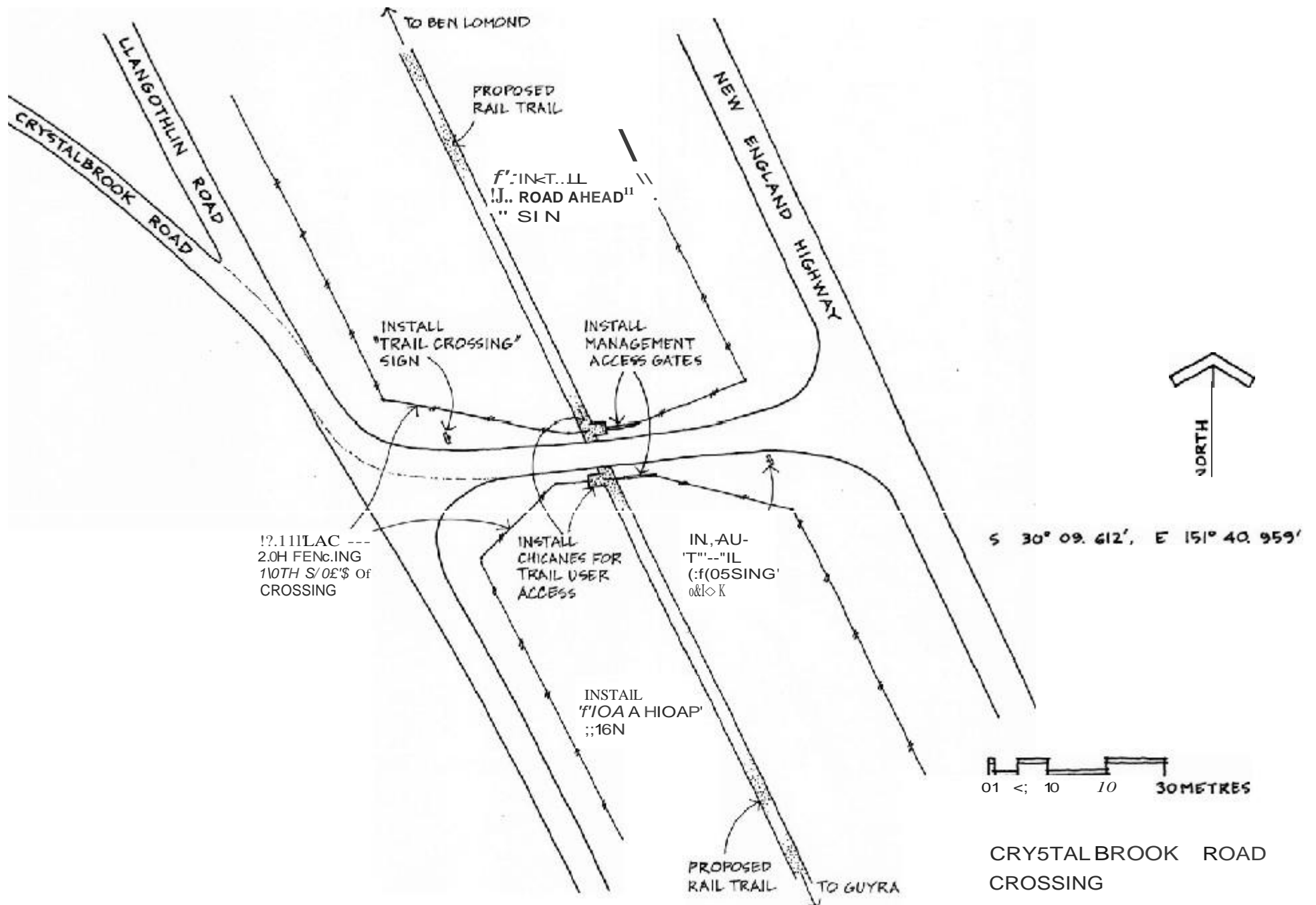
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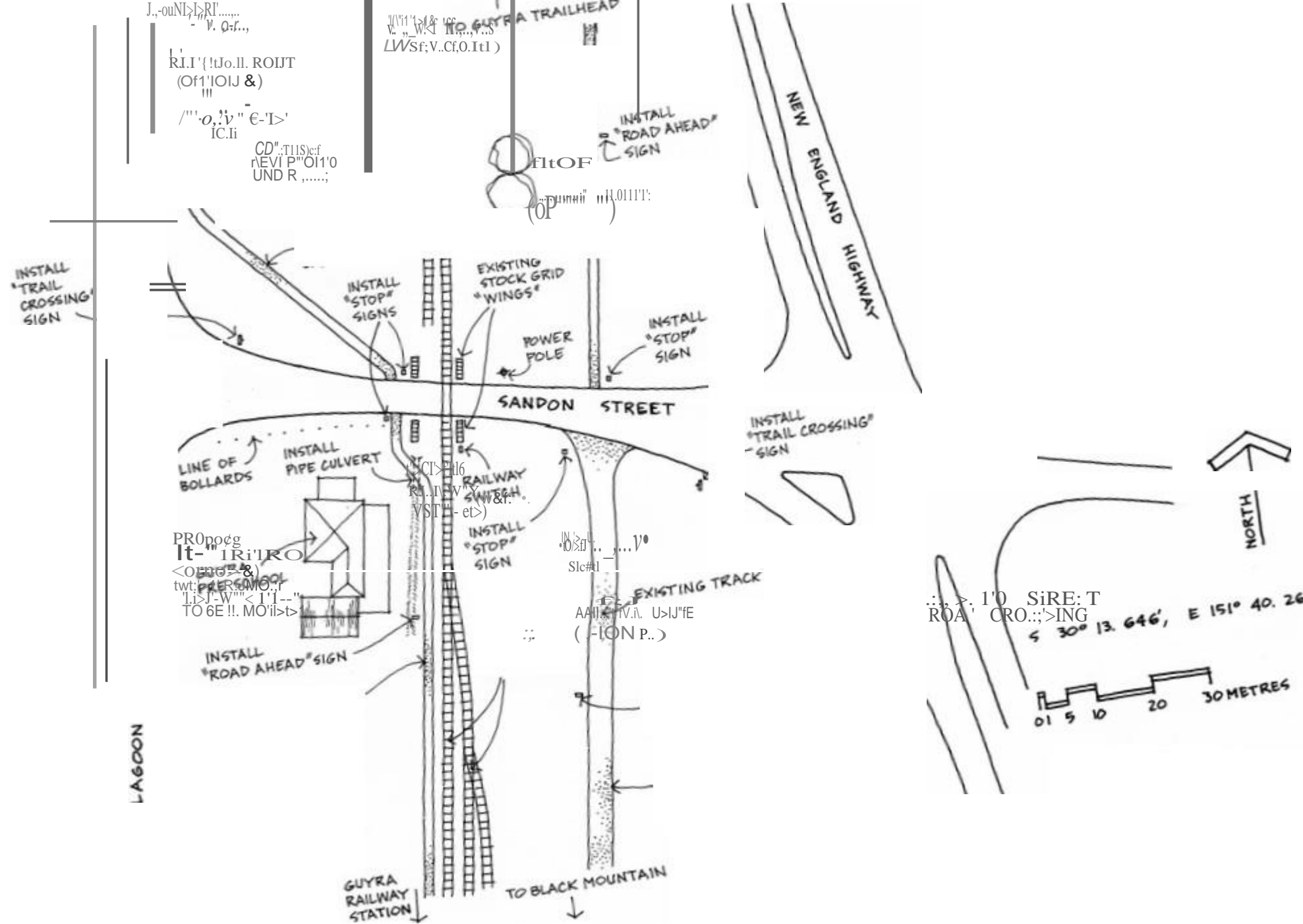


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A hand-drawn diagram of a staircase with four steps. The horizontal segments are labeled 0, 5, 10, 20, and 30 METRES.



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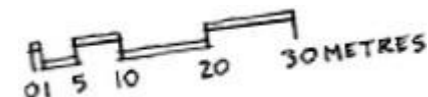
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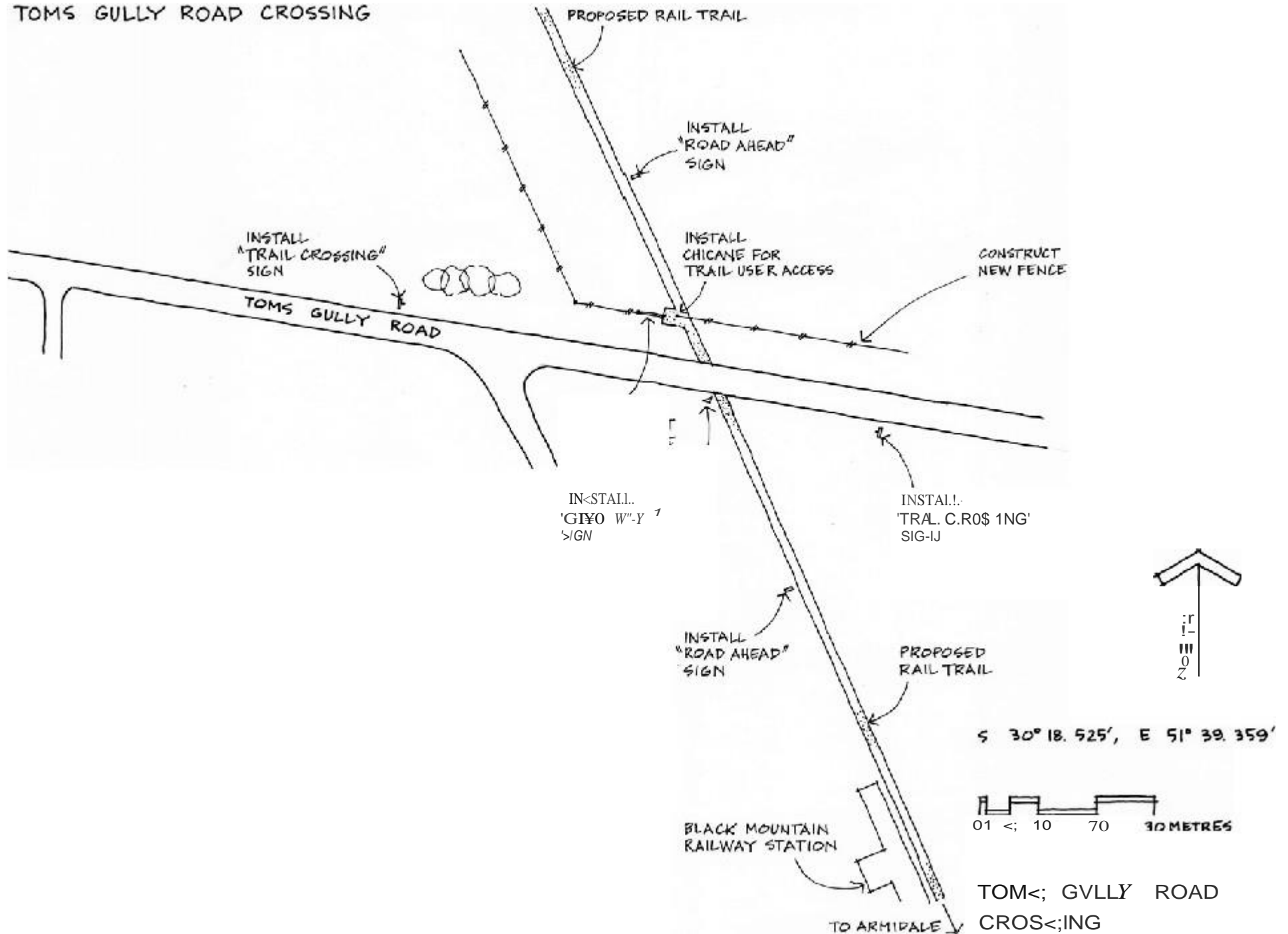


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NEW ENGLAND RAIL TRAIL TOMS GULLY ROAD CROSSING

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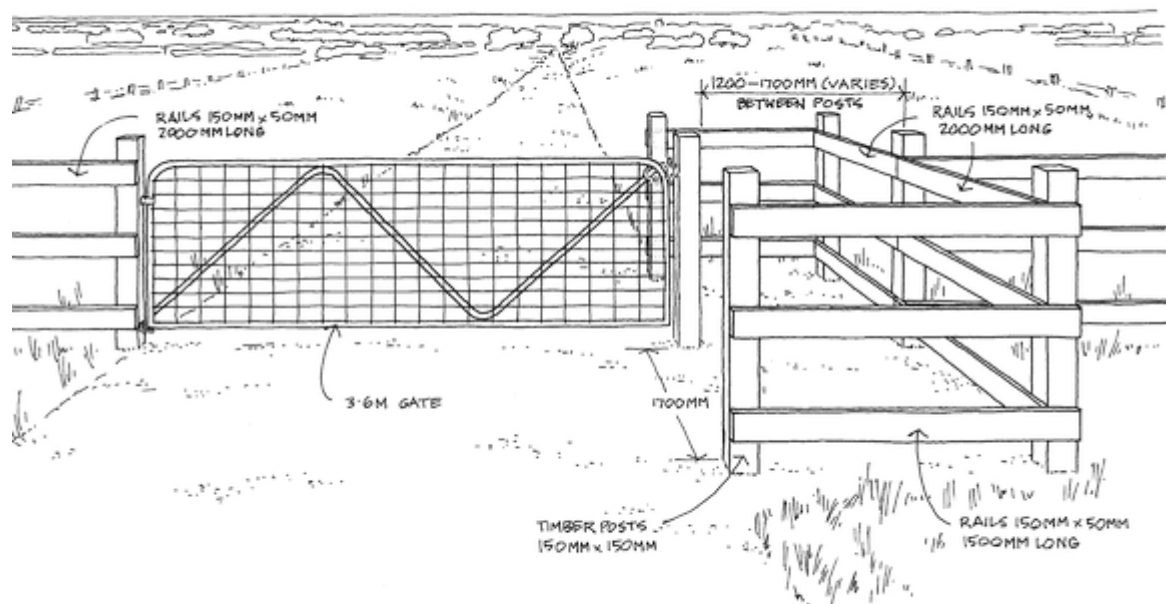
APPENDIX 2: ROAD CROSSING CHICANE DRAWINGS

The spring loaded 1200mm gate should only be installed where there is the likelihood of livestock on the trail (if the trail manager deems that appropriate and agreements and licences are in place). The gate should open “inwards” – to the trail rather than to the road (to prevent livestock pushing it open). The gate deliberately “stops” on the inside centre post (the gate is wider than the opening) to prevent livestock pushing it open.

Where there is no likelihood of livestock, a gate should be installed only if the trail manager has a need to lock the gate on a regular basis (such as for events). In these cases, a standard gate (with no spring) could be used (the photo from the Lilydale Warburton Rail Trail shows such a gate).



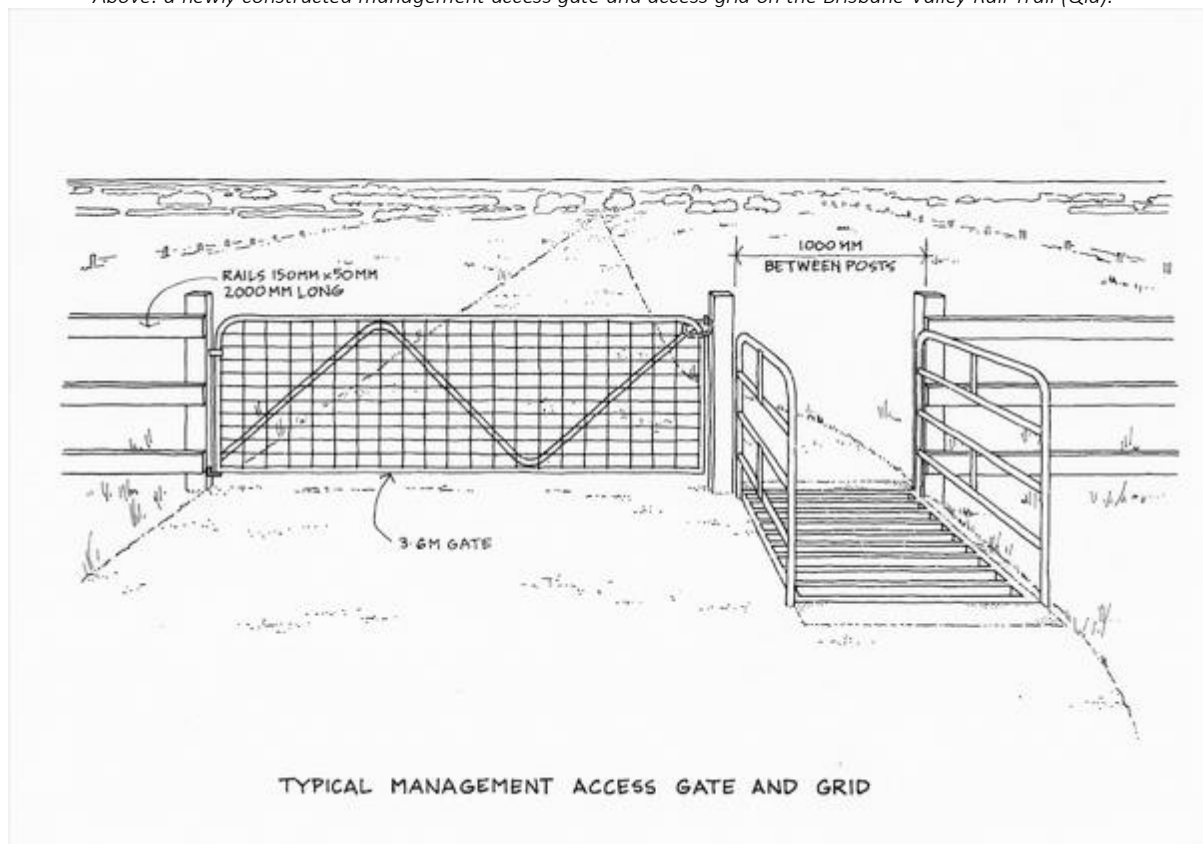
Above: a management access gate and access chicane on the Lilydale to Warburton Rail Trail (Vic).

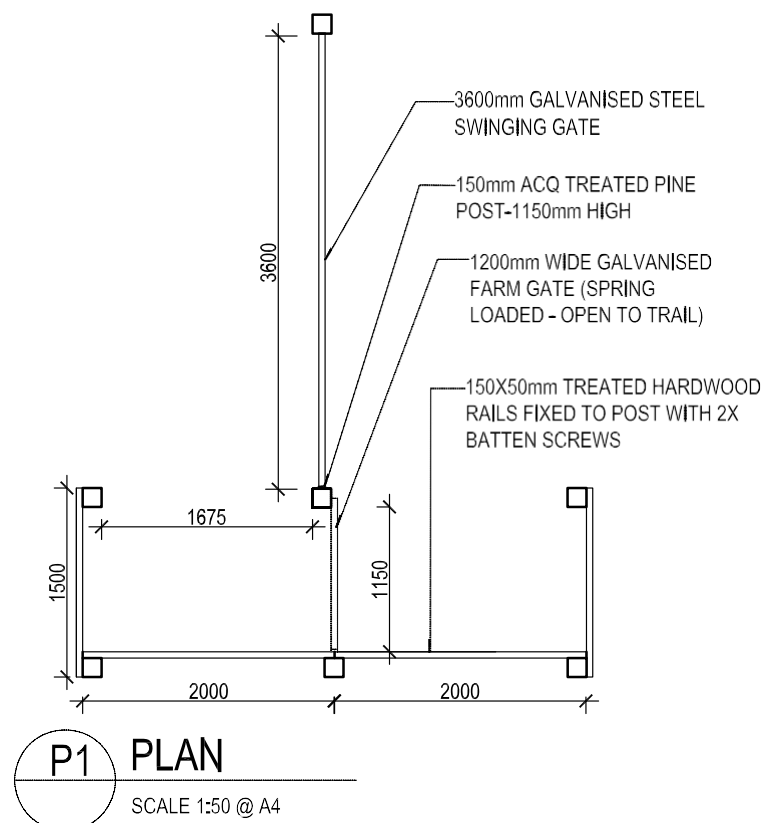
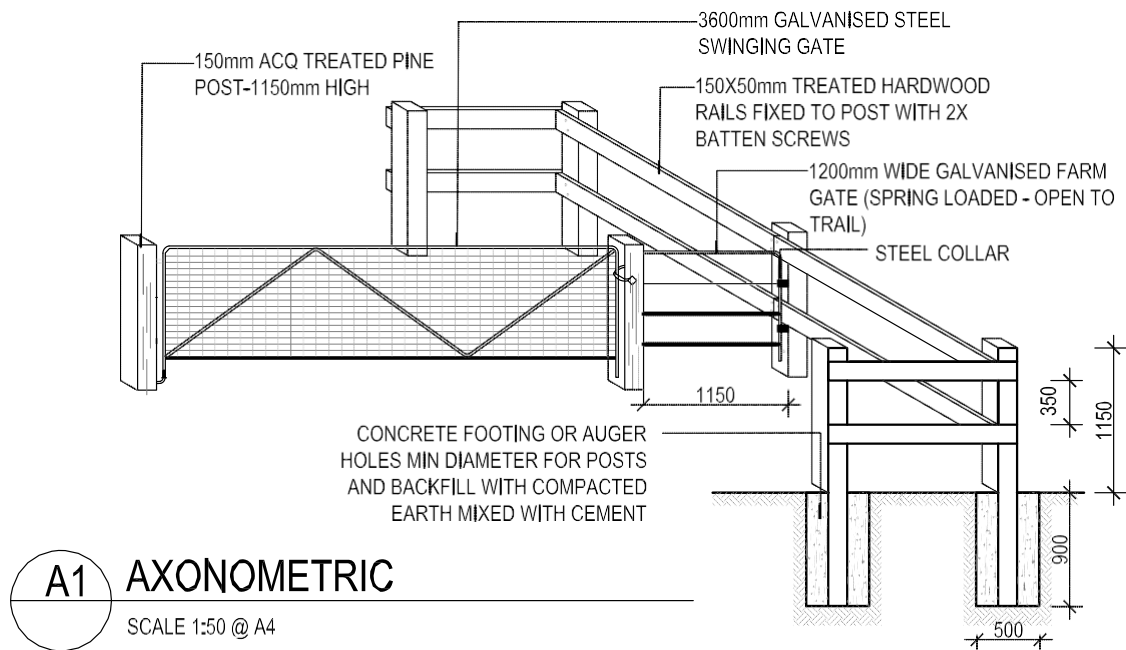


TYPICAL MANAGEMENT ACCESS GATE AND CHICANE



Above: a newly constructed management access gate and access grid on the Brisbane Valley Rail Trail (Qld).

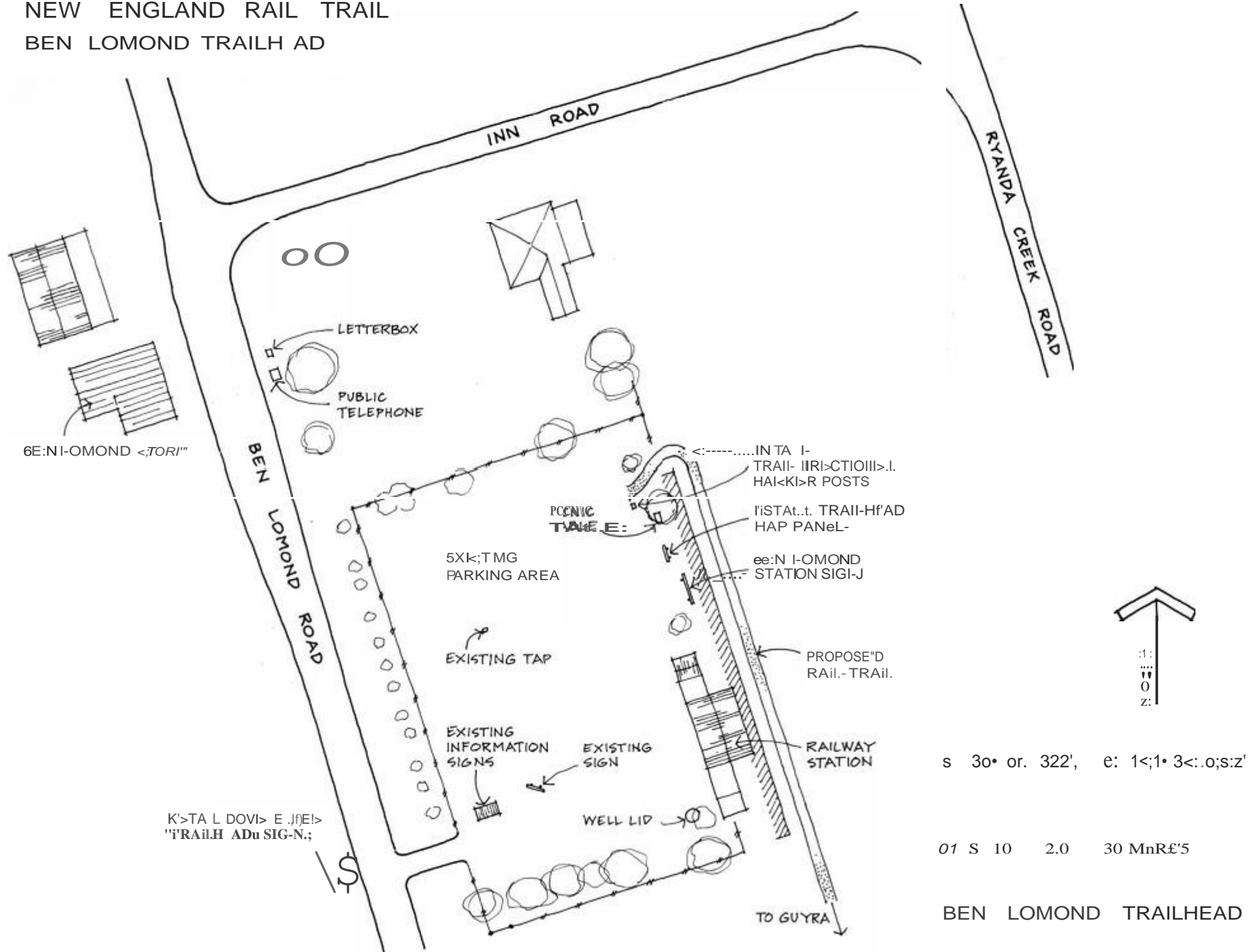


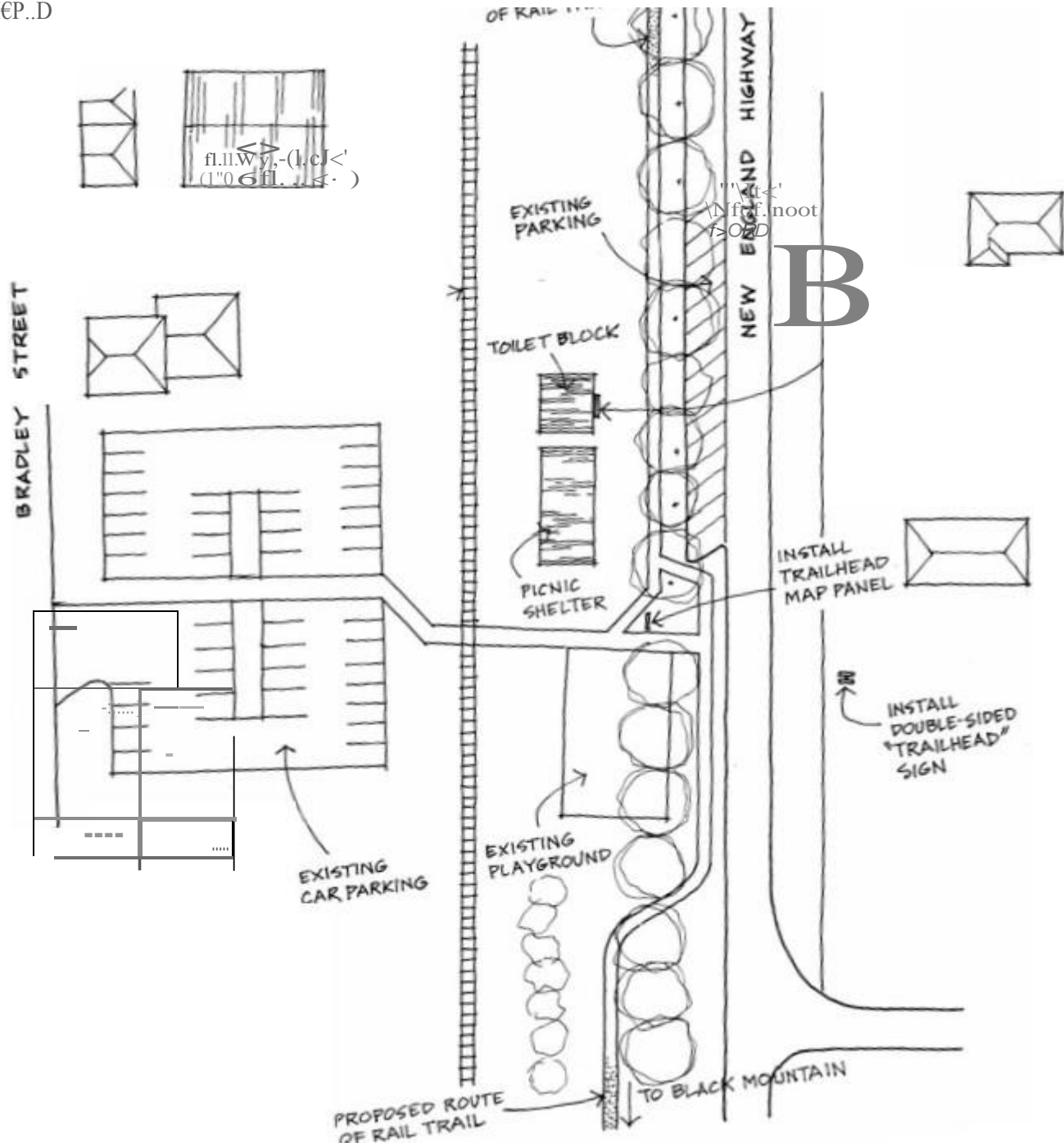


APPENDIX 3: TRAILHEAD DRAWINGS

NEW ENGLAND RAIL TRAIL

BEN LOMOND TRAILHEAD



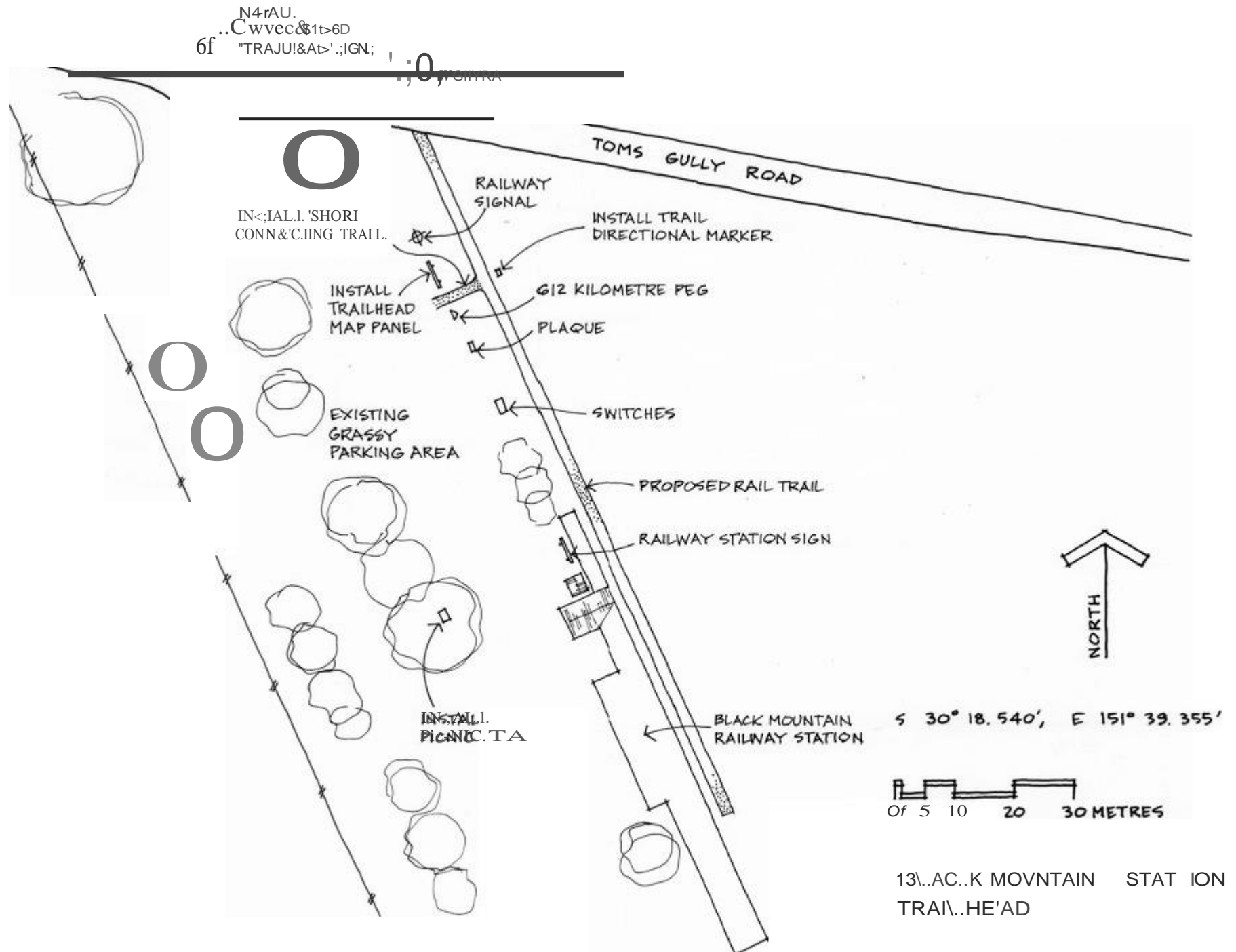


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GUYRA TRAILHEAD

NEW ENGLAND RAIL TRAIL

BLACK MOUNTAIN STATION TRAILHEAD



APPENDIX 4: TRAIL MAINTENANCE CHECKLIST: AN EXAMPLE

keP track maintenance cHecklist

the checklist that follows has been designed to be completed before each regular inspection, filled out and filed for future reference it is assumed the inspection will commence at Mt Helena and proceed in a westerly direction towards Wodonga this is an essential component of the maintenance program

keP track (mt Helena to Wooroloo) - maintenance cHecklist

inspection date (circle day and tick one box)

- | | | | |
|---------------------------------------|---------------------------------------|--|---------------------------------------|
| <input type="checkbox"/> Jan 2005/6/7 | <input type="checkbox"/> Feb 2005/6/7 | <input type="checkbox"/> mar. 2005/6/7 | <input type="checkbox"/> apr 2005/6/7 |
| <input type="checkbox"/> may 2005/6/7 | <input type="checkbox"/> Jun 2005/6/7 | <input type="checkbox"/> Jul 2005/6/7 | <input type="checkbox"/> aug 2004/5/6 |
| <input type="checkbox"/> Sep 2004/5/6 | <input type="checkbox"/> oct 2004/5/6 | <input type="checkbox"/> nov 2004/5/6 | <input type="checkbox"/> dec 2004/5/6 |

actual date _____

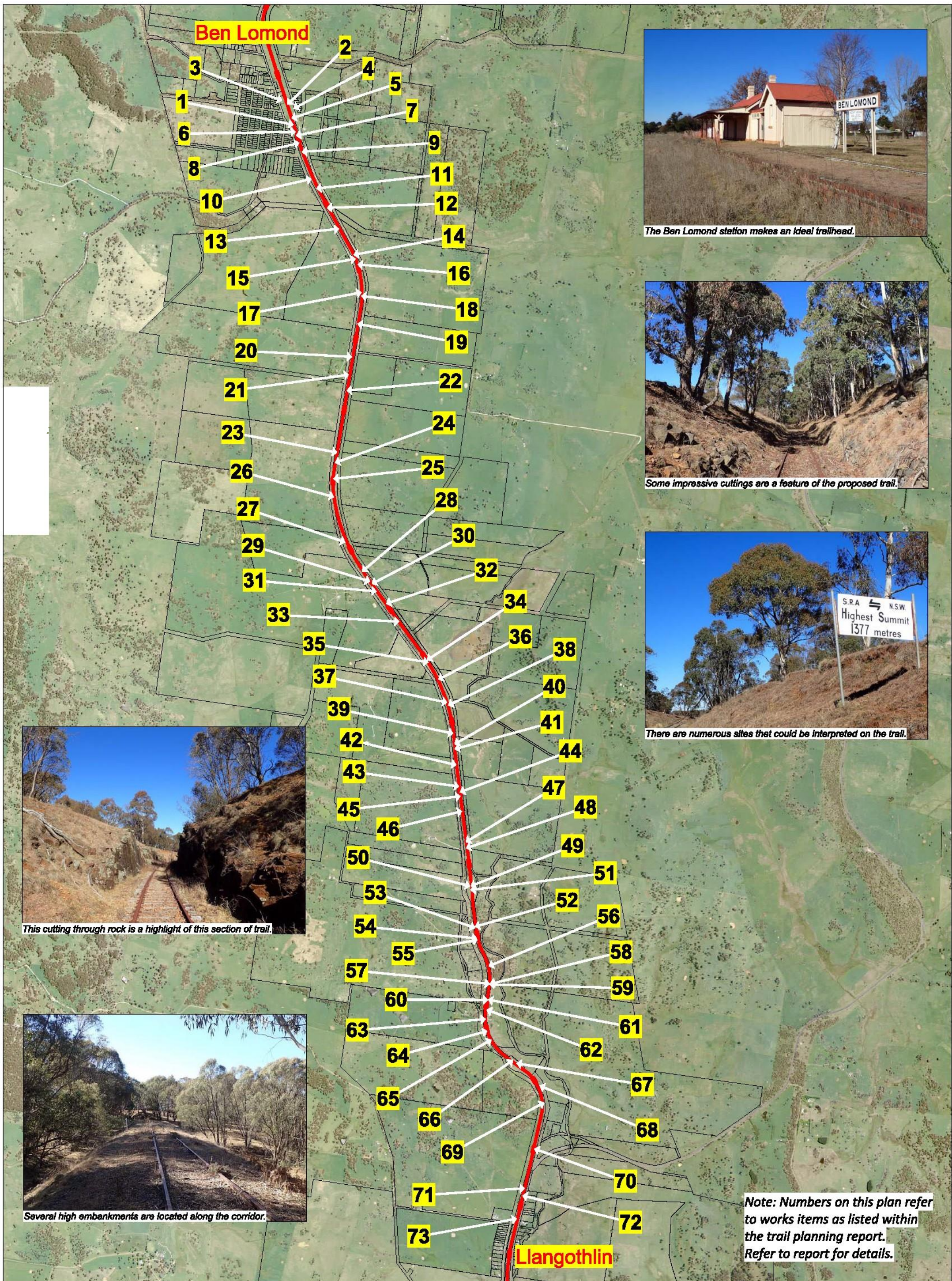
Person undertaking inspection _____ Signature _____

location	action required	tick if okay	action taken (if any)
Sayes Road Crossing in Mt Helena	<input type="checkbox"/> Check gate west side <input type="checkbox"/> Check directional markers <input type="checkbox"/> Check tidens and signage <input type="checkbox"/> Check positional signage		
Johnston Street (Mt Helena)	<input type="checkbox"/> Check gate west side <input type="checkbox"/> Check directional markers <input type="checkbox"/> Check tidens and signage		
Lion St crossing	<input type="checkbox"/> Check gates both sides <input type="checkbox"/> Check interpretive sign (north west corner) <input type="checkbox"/> Check directional markers <input type="checkbox"/> Check tidens and signage <input type="checkbox"/> Check positional signage		
Exit from Eastern Hills High School (crossing)	<input type="checkbox"/> Check gate east side <input type="checkbox"/> Check directional markers <input type="checkbox"/> Check tidens and signage <input type="checkbox"/> Check interpretive sign (opposite Sime rd)		
Thomas/Elliott road crossing	<input type="checkbox"/> Check gates both sides <input type="checkbox"/> Check directional markers <input type="checkbox"/> Check tidens and signage <input type="checkbox"/> Check positional signage <input type="checkbox"/> Check interpretive sign (opposite booster station)		
Chidow Reserve	<input type="checkbox"/> Check interpretive signs (at turn off to Lake Escheraultia opposite stand pipe, opposite store building at dirt interpretive shelter) <input type="checkbox"/> Check condition of new trail through reserve		

keP track (mt Helena to Wooroloo) - maintenance checklist

location	action required	tick if okay	action taken (if any)
Old Nathan Rd (Chidow)	<input type="checkbox"/> Check gate east side <input type="checkbox"/> Check directional markers <input type="checkbox"/> Check tidens and signage <input type="checkbox"/> Check promotional signage <input type="checkbox"/> Check culvert west side <input type="checkbox"/> Check ramps <input type="checkbox"/> Check interpretive sign (midpoint between old Nathan and Bath Rd)		
Ash Rd crossing	<input type="checkbox"/> Check gates both sides <input type="checkbox"/> Check directional markers <input type="checkbox"/> Check tidens and signage <input type="checkbox"/> Check promotional signage		
Darwin Rd crossing	<input type="checkbox"/> Check gates both sides <input type="checkbox"/> Check directional markers <input type="checkbox"/> Check tidens and signage <input type="checkbox"/> Check promotional signage <input type="checkbox"/> Check interpretive sign (150 metres east of crossing)		
Old Nathan Rd crossing	<input type="checkbox"/> Check gates both sides <input type="checkbox"/> Check directional markers <input type="checkbox"/> Check tidens and signage <input type="checkbox"/> Check promotional signage <input type="checkbox"/> Check culverts (both sides) <input type="checkbox"/> Check interpretive sign (SW corner)		
Entrance to hose trials paddocks	<input type="checkbox"/> Check gates <input type="checkbox"/> Check directional markers <input type="checkbox"/> Check tidens and signage <input type="checkbox"/> Check road warning signs		
Coventry Rd crossing	<input type="checkbox"/> Check gates both sides <input type="checkbox"/> Check directional markers <input type="checkbox"/> Check tidens and signage <input type="checkbox"/> Check new 40 metre section of trail at road crossing		
Coventry Rd to Green St	<input type="checkbox"/> Check interpretive sign (where pipeline crosses trail) <input type="checkbox"/> Check interpretive sign (opposite Jason St)		
Green Street	<input type="checkbox"/> Check gates both sides <input type="checkbox"/> Check directional markers <input type="checkbox"/> Check tidens and signage		
any additional work required?			
Final inspection	With detail - annually		
annual budget allocation	discuss with staff		

APPENDIX 5: RAIL TRAIL PLANS 1 – 3



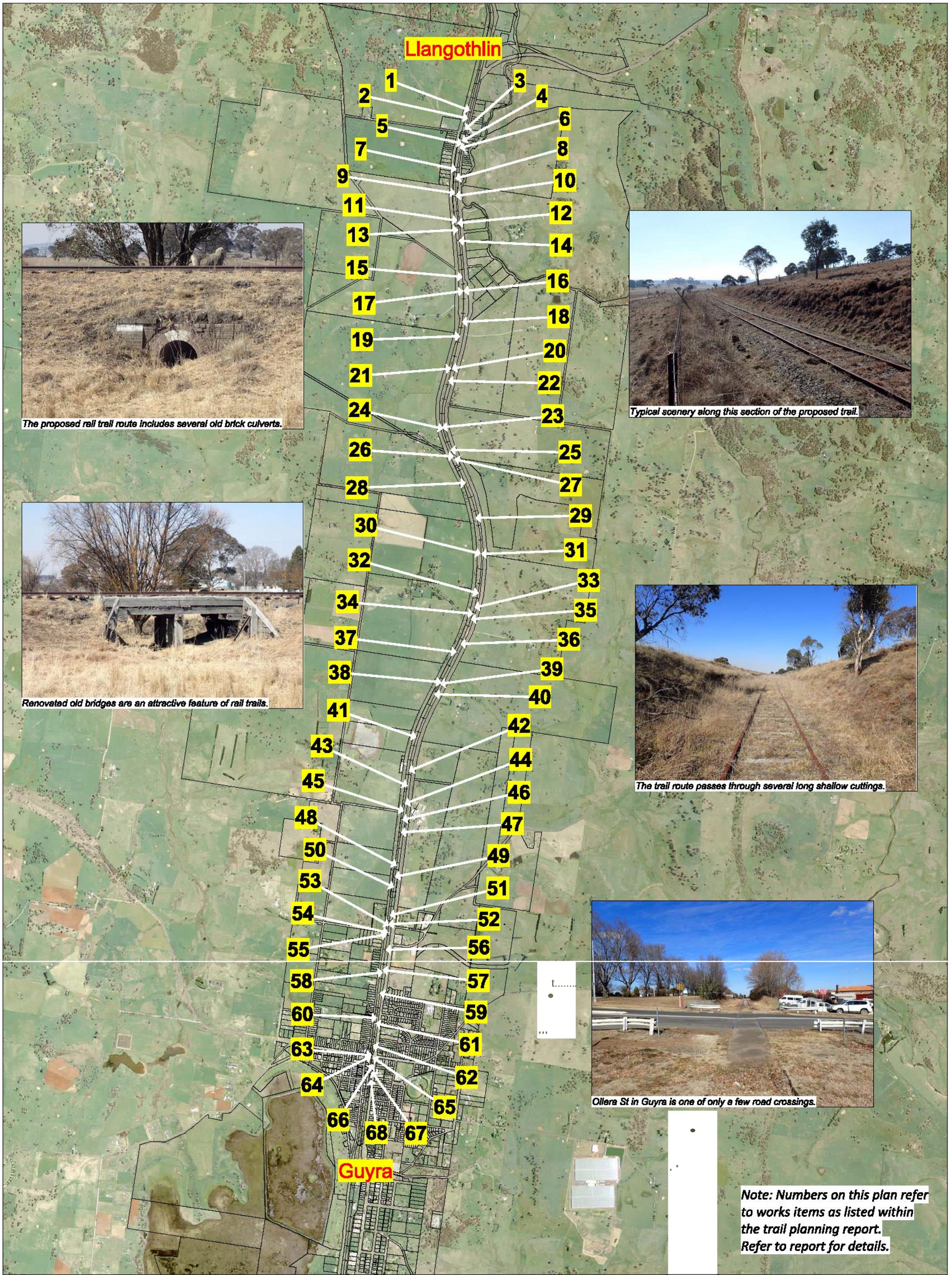
New England Rail Trail

Plan 1:
Ben Lomond to Llangothlin

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New England Rail Trail



Two route options through Guyra Station are proposed.



Careful attention to the old bridges is needed.



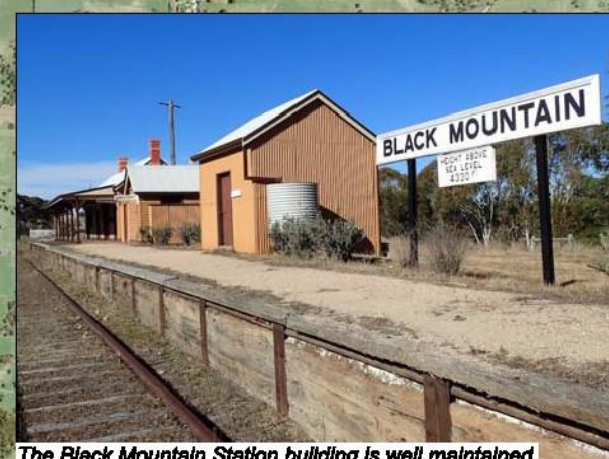
Several minor roads and driveways are encountered.



Impressive cuttings are an attraction to trail users.



Retention of all old railway signage is recommended.



The Black Mountain Station building is well maintained.

Black Mountain

Note: Numbers on this plan refer to works items as listed within the trail planning report. Refer to report for details.

New England Rail Trail

Plan 3:
Guyra to Black Mountain

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Planning and Design



August 2018