



# New England Rail Trail

## NSW PW Desktop Review: Ben Lomond to Glen Innes Section

New England Rail Trail Incorporated

## Project Document Control

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## Abbreviations

Abbreviation	Description
NERT	New England Rail Trail
NRRT	Northern Rivers Rail Trail
PW	NSW Public Works
GISC	Glen Innes Severn Council
ARC	Armidale Regional Council
TfNSW	Transport for New South Wales
TSC	Tweed Shire Council
BLER	Bushfire Local Economic Recovery Fund

## 1. Executive Summary

The Glen Innes Severn Council (GISC) has been offered \$8.72M in State Government funding under the Bushfire Local Economic Recovery (BLER) Fund to construct 35.5km of the New England Rail Trail from Ben Lomond to Glen Innes. It is understood that the \$8.72M funding for the Ben Lomond to Glen Innes section is capped and has an expenditure deadline of the end of June 2024.

NSW Public Works (NSW PW) was engaged by the by the Glen Innes Severn Council to perform the following services related to their funding proposal for the New England Rail Trail from Ben Lomond to Glen Innes section:

- Review of the overall Project scope that is the subject of the grant application;
- Review the Project Estimate and provide commentary on whether the estimate is reasonable. Where the estimate for a line item is considered unreasonable or where key items have been omitted, NSW PW will provide a cost estimate, or provide further details on the missing scope items based on lessons learned;
- Produce a program with an associated cashflow;
- Make recommendations for appropriate amendments to the project scope, estimates, and milestones to accommodate the funding constraints; and
- Provide a brief summary of project risk and lessons learned based on NSW PW's involvement in other Rail Trail projects within NSW.

The NSW PW desktop analysis identified the revised project estimation with no contingency applied comes in at \$8,637,030, just under the BLER budget requirement of \$8,721,095. However, once a recommended contingency is applied a further \$2,075,133 of funding is necessary, pushing the total budget to \$10,796,288. It is encouraged to discuss funding opportunities with the BLER funding body or an additional source.

Furthermore, a review of the project program identified a forecast completion for the End of October 2024. It is recommended to continue the progress of the deed execution and lease negotiations with TfNSW as quickly as possible, as any delays will likely impact the estimated project completion date. The analysis also identified the opportunity for GISC to reduce the pressure on the program by completing early works in 2023 and removing the rail and sleepers. It is recommended to continue working collaboratively with the BLER funding body and discuss options regarding project completion beyond June 2023.

Whilst the desktop analysis identified challenges with the budget and timeframe, it was determined there is still a window of opportunity to seek additional funding and further discuss funding timeframes whilst the project approvals and design proceed in 2023. As such, there is still an opportunity to deliver a positive community-focused project from which the region will prosper for years to come.

The lessons learned and recommendations in this report are not exhaustive, and NSW PW would be happy to continue to provide advice and assistance through the development of the NERT Project.

## 2. Project Approvals

This section describes the planning works and approvals that will be required to be in place before any construction can take place within the railway corridor. It is of value to understand the approval process and timeframes as this will determine the project's ability to meet the end completion targets.

The findings provided in the section are to the best of our knowledge within NSW PW and should be confirmed via Councils' planning & legal department.

### 2.1 Closure of the railway

Under the *Transport Administration Amendment (Rail Trails) Act 2022* that was passed in 2022, the regulations may authorise the use of the subject land for recreation, tourism or related purposes or road or road infrastructure and authorises the rail infrastructure owner to enter into a lease of the subject land with a local council for those purposes. Accordingly, Glen Innes Shire Council (GISC) and Armidale Regional Council (ARC) will not require separate authorisation from an Act of Parliament and the regulations, when made, can allow the disused rail trail to be used for the purpose of recreation and tourism and roads or road infrastructure facilities. Therefore, GISC can proceed to engage with Transport for NSW (TfNSW) to negotiate the appropriate lease agreement arrangements relevant for the NERT Ben Lomond to Glen Innes section.

Additional time needs to be accommodated in the project program to allow for the development of the necessary regulations. It is important to note when the regulations are complete, they will require a two-week period for approval in parliament.

### 2.2 Lease for construction, operation and maintenance of the Rail Trail

The track (including easements & infrastructure) is mostly managed by the Country Regional Network (CRN) as a non-operational line. The CRN is owned by TfNSW but is operated & maintained by UGL Regional Linx. Those track elements not managed by CRN are owned or managed by RailCorp or the Australian Rail Track Corporation (ARTC).

Tweed Shire Council (TSC) entered into an initial short-term lease with TfNSW to access and inspect the rail corridor and then a longer 30-year lease with TfNSW to construct and operate the rail trail within the rail corridor. As such, it is recommended that GISC should confirm corridor ownership arrangements with TfNSW and enter into similar lease agreements related to their section of the Rail Trail.

It is noted that in the NERT scoping document that the trail is to span two LGAs with approximately 33.7 km in the Glen Innes Severn Council LGA and 1.8 km in the Armidale Regional Council LGA.

Based on NSW PWs experience in rail trails in NSW, it is recommended that GISC:

- Initiate lease negotiations with TfNSW;
- Seek to enter 2 leases with TfNSW for the entire length of the 35.5km section.
  - o Although there is approx. 1.8km of the trail within the ARC LGA, the land is owned by the State Government, not the ARC. As such, TfNSW could potentially enter into an agreement solely with GISC as long as the ARC provides a form of approval. Once the Rail Trail connection between Ben Lomond and Armidale is constructed later, an amendment can be made to the GISC lease with TfNSW that transfers the 1.8km section to ARC. Alternatively, ARC may also be a co-determining authority for the section in their LGA Rail Trail.
- Lease One : Short-term early access and investigation works.
  - o The purpose of this lease is to allow GISC early access into the corridor to begin the onsite investigative works to develop the Rail Trail tender documentation and, subsequently, the design.
- Lease Two : Long-term lease arrangement (for example, TSC lease is 30 years).
  - o The purpose of this lease is to allow GISC to construct and operate the rail trail within the corridor when executed. The development of this lease can be lengthier. By executing two lease agreements, the negotiations of part two can be thoroughly undertaken to ensure both parties benefit without delaying early investigative work.

- Seek all records of existing lease arrangements, including mapping between TfNSW or third-party representatives, such as UGL Regional Linx, and private landowners along the corridor.
  - o Generally, under the terms of the long-term Lease with Council, it will be permissible to enforce any rights or obligations under the Pre-existing Tenancies agreements and, if necessary, renew or terminate the Pre-existing Tenancies in accordance with the terms of the applicable document and policies and procedures etc. Therefore, Council will have the right to renew, terminate or maintain (do nothing) Pre-existing Tenancies once the long-term lease is executed. Seeking appropriate legal advice during the lease development will be essential. GISC are to confirm with TfNSW if there are any Pre-existing Tenancies that are exempt and Council cannot choose to renew, terminate or maintain. GISC are to confirm who receives the income from any Pre-existing Tenancies.
- Have TfNSW identify all assets within the GISC corridor (such as overhead bridges, Crotty Bridge overpass or underpasses) and clarify who is responsible for maintaining and servicing these assets in the lease agreement. It is recommended that the maintenance and servicing of any overhead or underpass structures that allow the movement of landowner animal livestock or machinery or traffic from one side of the corridor to the other remain with TfNSW. Thus, reducing the council's liability and ongoing operational costs.

#### **Lease Summary Recommendations:**

1. GISC initiate lease negotiations with TfNSW for the full 35.5km length;
2. Two lease agreements are entered with TfNSW. One is for early access and investigations within the corridor; the second is for the construction and operation of the trail;
3. GISC seek a record of all existing lease agreements from TfNSW; and
4. GISC and TfNSW determine who is responsible for maintaining all assets crossing the rail corridor.

## **2.3 Environmental and Planning**

### **2.3.1 Planning Pathway**

NSW PW has consulted with its Environmental Scientist from NSW PW's Environment and Planning group on alternative rail trails and can offer the following preliminary advice in relation to the planning approval pathway. Council should internally verify this pathway.

Under the Transport Administration Amendment (Rail Trails) Act 2022 that was passed in 2022, the regulations may authorise the use of the subject land for recreation, tourism or related purposes or road or road infrastructure and authorises the rail infrastructure owner to enter into a lease of the subject land with a local council for those purposes. Accordingly, GISC and ARC will not require separate authorisation from an Act of Parliament and the regulations, when made, can allow the disused rail trail to be used for the purpose of recreation and tourism and roads or road infrastructure facilities.

To facilitate the recently completed rail trail development within the Tweed LGA, Tweed Shire Council amended the *Tweed Local Environmental Plan 2014* to allow development for the purposes of the rail trail within identified land to be permissible without consent under *Schedule 1 - Additional Permitted Uses, Section 20 - Use of certain land between Crabbes Creek and Murwillumbah for rail trail*. One option is for Glen Innes Severn Council to consider a similar amendment to the *Glen Innes Severn Local Environmental Plan 2012*, tailored accordingly for proposed rail trail development within the LGA area. If Council selects the LEP amendment, it is recommended that this process be commenced as soon as possible, as the anticipated timeframe for an amendment to the LEP would be approximately 12 months.

The NSW Rail Trails Framework (Regional NSW, June 2022) provides for an alternative and recommended approval pathway utilising Section 2.109 (1) of the State Environmental Planning Policy (Transport and Infrastructure) 2021 (T&I SEPP). Under this section, development for the purpose of 'road infrastructure facilities' can be carried out by or on behalf of a public authority without consent on any land.

'Road infrastructure facilities' are defined as:

*(a) tunnels, ventilation shafts, emergency accessways, vehicle or pedestrian bridges, causeways, road-ferries, retaining walls, toll plazas, toll booths, security systems, bus lanes, transit lanes,*

*transitways, transitway stations, rest areas and road related areas (within the meaning of the Road Transport Act 2013), and*

*(b) associated public transport facilities for roads used to convey passengers by means of regular bus services, and*

*(c) bus layovers that are integrated or associated with roads (whether or not the roads are used to convey passengers by means of regular bus services), and*

*(d) bus depots, and*

*(e) bus stops and bus shelters, and*

*(f) traffic control facilities (within the meaning of Part 6 of the Transport Administration Act 1988), TfNSW road safety training facilities and safety works, and*

*(g) premises used for the purposes of testing and inspecting heavy vehicles (within the meaning of the Road Transport Act 2013) under the TfNSW Heavy Vehicle Authorised Inspection Scheme.*

Subsection (a) of the definition of 'road infrastructure facilities' includes 'road related areas'. 'Road related areas' are defined under the Roads Transport Act 2013 (NSW) as:

*(a) an area that divides a road, or*

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

*(c) an area that is open to the public and is designated for use by cyclists or animals, or*

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

*(e) a shoulder of a road, or*

*(f) any other area that is open to or used by the public and that has been declared under section 18 to be an area to which specified provisions of this Act or the statutory rules apply.*

In accordance with clause (c) of the above definition, a 'road related area' includes an area that is open to the public and is designated for use by cyclists. The proposed rail trail meets this definition as it would be open to the public and designated for use by cyclists. Therefore, the development can be carried out by or on behalf of a public authority without consent under Section 2.109 (1) of the T&I SEPP.

Repair and repurposing of railway bridges to pedestrian/cycleway use, as outlined above, Section 2.109 (1) of the T&I SEPP enables development for the purpose of 'road infrastructure facilities' to be carried out by or on behalf of a public authority without consent on any land. Clause (a) of the definition of 'road infrastructure facilities' (see above) includes vehicle or pedestrian bridges. The proposed repair and repurposing of railway bridges to pedestrian/cycleway use meets this definition and therefore the development can be carried out by or on behalf of a public authority without consent under Section 2.109 (1) of the T&I SEPP.

Based on the above planning approval pathway, it is anticipated that the preparation of a Review of Environmental Factors (REF) would be required for the proposal, and Glen Innes Severn Council would be the determining authority for the proposed rail trail works. If the railway station properties or any sections of the rail trail remain under the control of TfNSW, it is also anticipated the railway station works or works within the rail corridor under the control of TfNSW would be permissible without consent under SEPP (Transport & Infrastructure) 2021 with either TfNSW being the determining authority or GISC as the determining authority, by agreement.

An Aboriginal Cultural Heritage Assessment would be required for the project. Although the Rail Trail alignment traverses previously disturbed land and an AHIMS search hasn't been undertaken to identify known Aboriginal sites in proximity to the alignment, the Rail Trail alignment crosses multiple waterways, which are a landform where it is considered that there is a high likelihood of Aboriginal objects being present. Given that the bridges crossing waterways are likely to require upgrade works, there is the potential to harm Aboriginal objects associated with the proposed Rail Trail works. It is recommended to allow five to six months for an Aboriginal Cultural Heritage Assessment to occur, due to the statutory consultation periods involved. If the Aboriginal Cultural Heritage Assessment Report (ACHAR) finds that an Aboriginal Heritage Impact Permit (AHIP) is required for the works, this would be extended by an

additional six to eight months to prepare the ACHAR and AHIP approval. Further investigation such as test excavations may be required to support an AHIP, resulting in additional costs and time delays.

A Statement of Heritage Impacts (SOHI) will be required for the Proposal to assess potential impacts on historic (European) heritage. The Ben Lomond and Glen Innes Railway Stations are listed on the State Heritage Register (SHR No. 01083 and 01149) under the *Heritage Act 1977*. In addition, associated stations, rail bridges and nearby items may also be subject to Stage Agency listings under section 170 of the Heritage Act or local heritage listings under the GISC LEP and assessment of these listed heritage items would also be required. As works to upgrade and repurpose the State listed heritage sites are proposed, a SOHI will be required to assess the impact of the works on the railway station sites and provide guidance to mitigate potential heritage impacts. Approval from Heritage NSW under section 60 of the Heritage Act may be required for works within the curtilage of any State Heritage listed items (eg. Railway Stations).

It is recommended to allow at least six months for the SOHI assessment and section 60 approval from Heritage NSW for works to the Ben Lomond to Glen Innes section of the Rail Trail if required.

A Biodiversity Assessment would also be required for the proposal. Although the Rail Trail will be located within previously disturbed land, the alignment may pass through areas comprising threatened ecological communities or areas where threatened flora and fauna are known to occur. The assessment should identify these areas and include mitigation measures for the construction works to minimise potential impacts on terrestrial biodiversity. In addition, bridge works may impact waterways and/or riparian zones. Therefore, the biodiversity assessment should also include an assessment of impacts on aquatic biodiversity, as approval from DPI Fisheries under the *Fisheries Management Act 1994* may be required for works entering water land. Three to six months should be allowed for the biodiversity assessment in case targeted surveys are required.

A Preliminary Site Assessment for potential soil contamination may also be required depending on whether previous land uses have the potential to have resulted in land contamination. Ideally, the assessment should be carried out early as part of any geotechnical assessments (if needed) to inform the design and construction works.

Lastly, a biosecurity report prepared by the Local Land Services for Council is recommended. This document captured the key risks and recommended mitigation measures to both the trail users and the adjoining landowners. The biosecurity report was used to assist landowner consultation and also fencing scope development.

## 3. Scope Review

### 3.1 Project Construction

#### 3.1.1 Path

##### Length:

This project will construct a 35.5km of Rail Trail from Ben Lomond to Glen Innes. The trail will span two LGAs with approximately 33.7 km in the Glen Innes Severn Council and 1.8 km in the Armidale Regional Council.

From reviewing the 35.5km length, it is recommended to maintain the 35.5km length scope from Ben Lomond to Glen Innes for the following reasons:

- Strategically it provides a trail connection from a significant township (Glen Innes) to a smaller township just beyond the LGA boundary. This encourages the neighbouring Armidale Regional Council to continue the trail south to Armidale due to the expected economical tourism benefits of a connection between two major rural centres (Glen Innes to Armidale).
- Anchoring trailheads to population centres gives the trail users a greater purpose to travel the entire length (end to end) and allows the trail to utilise existing township infrastructure, such as toilets, drinking water bubblers, shelters, and parking.
- To reduce costs, the GISC could shorten the trail by 13.9km to Glencoe. The Glencoe trailhead, roughly in the middle of the GISC LGA section, provides users with a midway point to stop and rest if required. However, if the trail terminated at Glencoe, there is a risk that the trail will be less attractive to prospective users due to the significant reduction in length. Additionally, whilst the Glencoe to Ben Lomond section is incomplete, there will be less buy-in from key stakeholders to construct the future Ben Lomond to Armidale section as prospective users will not be able to travel the entire length from Ben Lomond to Armidale.

##### Width:

The NERT final report scoping document details that the Rail Trail will be constructed predominantly on formation, with short off-formation sections if needed to allow for heritage interpretation or other considerations. Where the path is to be on-formation, the existing railway lines, sleepers, and vegetation will be removed, and the existing ballast will be spread and compacted to form the pathway pavement subbase. The pathway will be a nominal 2.5m width of unsealed gravel blend pavement with the consideration of a separate slashed bridle trail would be a width of 1m for the use of horse riders.

Based on the learnings from the previously constructed Northern Rivers Rail Trail – Murwillumbah to Crabbes Creek Section (herein the Tweed Rail Trail), it is recommended to increase to a nominal 3m width where possible. It is noted that the existing ballast will dictate the trail's width, and it was found on the Tweed Rail Trail that the ballast was often up to 4.0m wide. Whilst it is an increase in material, it will improve overall constructability and reduce construction time. The following points are recommended to be considered for increasing the proposed 2.5m width to 3m:

- Dumping the unsealed gravel blend will determine the grader's working width or posi-track with a grader blade. The smaller the trail's width, the more difficult it is to dump the material within the required working width whilst ensuring the unloaded material is at a thickness that allows the grader to follow and spread the material without significant overspill beyond the 2.5m width or rework. A 3m nominal width would allow a greater tolerance for the unloading of the material and decrease overall machinery runtime.
- A nominal 3m wide trail may allow the material to be moved directly from the quarry to the site and unloaded direct on the non-woven needle-punched geotextile placed on the ballast. This was not able to be trialled on the Tweed Rail Trail due to substantial overhead foliage.

- It is recommended to try the direct placement of material vs an onsite material stockpile area with a smaller and more controlled dump truck. The best method will be chosen based on cost, available machinery and operators.
- Improved access to machinery and vehicles during construction, operation and maintenance. On the Tweed Rail Trail, the increased width improved the moveability of vehicles on the trail during the construction of key areas such as bridges and the delivery of materials. It is acknowledged that the NERT has a less aggressive topography compared to the Tweed Rail Trail. However, it is recommended to minimise vehicles or machinery traversing the trail edges as it will degrade the unbound pavement over time.
- Allowing for the additional width provides benefits to rail trail users, particularly with the ease of groups of walkers/runners/cyclists passing each other, especially during organised group events such as fun runs. It also allows for more space for the movement of: emergency vehicles such as ambulances; horse-riders if horses are to be allowed; and larger electric-powered vehicles such as E-trikes.

## Path Surface

The NERT scoping report defines that the planned surface for the NERT is a compacted pavement gravel mix. Rail trails across Australia and overseas have a range of sealed, unsealed, or a combination of these for their trail surfaces depending on a number of factors, including: preferences of rail trail users, potential impact from horses, available materials, available budget at the time of construction, topography, climate, and location. For the Tweed Rail Trail the pathway specification required the sections of trail adjoining and through towns/villages to be sealed using asphaltic concrete. These sections anticipate a higher number of rail trail users and a larger range of users across factors such as age and mobility, and also a larger range of transport types, including prams, wheelchairs, push-scooters etc. Other sections of this rail trail through more rural sections have been constructed with an unsealed surface using a compacted crushed gravel.

GISC may want to consider further the type of surface to be applied to the NERT, and whether this will be a consistent surface for additional sections of the rail trail. The current budget does not allow for any significant sections to be sealed, but this may be a consideration for future upgrades of the trail, if necessary, and if funding is available.

## Path Construction and Costing:

Whilst the NERT scoping report acknowledges the Councils proposed \$20 per lineal metre, it uses the \$60 per lineal metre rate in the overall estimation of \$8.721M. From review, it is recommended to increase the rate to \$80 per lineal metre for the following reasons:

- Construction cost increase due to recent inflation;
- Potential of double handling of unsealed pavement materials. It was found the Tweed Rail Trail material placement direct from the truck to the path was not achievable due to the lack of control trucks have when unloading the material, resulted in reworking the overspill and the available corridor space for heavy vehicle manoeuvring was too tight;
- Multiple runs with a smooth drum roller. During the Tweed Rail Trail path construction, in consultation with Tweed Shire Council, it was determined that ballast and gravel compaction was required to achieve the desired specifications and fall on the pavement. If not, the material would move at final compaction, resulting in water ponding, compromising the overall pavement life and increasing maintenance costs. Additionally, the Tweed Rail Trail contractor was required to reduce the smooth drum roller from a 12-tonne to a 7.5-tonne machine. Doing so allowed for greater compaction at the path's edging as the construction team found that the heavy 12-tonne machine could not get close enough to the path edges due to sub-grade ballast spill out;
- Increased machine operation time at path edging to ensure water can fall off the path; and

- A geotextile layer is recommended to be placed between the ballast and the unsealed gravel mix to stop the fines from migrating into the ballast and maintaining suitable material performance. GISC need to consider what machinery will be driving over the geotextile whilst placing the material. Machinery that is too heavy can could compromise the geotextile, resulting in rework.

Table 1 below shows the path construction cost difference when using the \$80 per lineal metre rate.

**Table 1 - Path construction costs**

No.	NERT Scoping Report Detail	GISC Council Proposed Cost (not recommended)	NSW PW Recommendations	Cost Difference over 35.5km
1	\$60 per lineal metre at 2.5m width	\$20 per lineal metre at 2.5m width	\$80 per lineal metre at 3m width	-\$710,000.00

### Removal of Rail and Sleepers

The NERT scoping report highlights the opportunity for a cost reduction in the removal of steel tracks, metal sleepers, metal railway jewellery and timber sleepers/transoms through the allowance of the removal contractor to sell the materials post-removal.

For the Tweed Rail Trail, the same methodology was applied, and the contractor had the flexibility to keep the removed rail and sleepers and independently arrange for the sale of these materials to appropriate metal recycling companies and landscaping companies. However, different to the NERT scoping report, under the Tweed Rail Trail contract, the Contractor was required to retain 80 good-condition sleepers and 15 x 6m lengths of steel for the Council to use for various purposes such as trail furniture, signage, community projects and other varied uses. It is recommended that at the time of construction, GISC ensures that a small allocation of good-condition sleepers or transoms and steel are kept for similar purposes.

The removal rate is recommended to be increased from \$8 per lineal metre to \$9 per lineal metre to allow for increased construction costs.

**Table 2 - Removal of rail and sleeper cost analysis**

No.	NERT Scoping Report Detail	NSW PW Recommendations	Cost Difference over 35.5km
1	\$8 per lineal metre	\$9 per lineal metre	-\$53,250.00

### Allowable Elements on the Trail

GISC will need to consider what elements will and will not be allowed on the trail as this will have a bearing on the design of the Rail Trail. For example, GISC will need to decide whether horses will be allowed on the rail trail for all or part of the trail, or perhaps on an adjacent bridle trail. Council's decision will influence the path design and costs. Other considerations will be whether dogs on leashes are allowable and confirm whether all other forms of motorised electric transport (e.g. electric scooters) outside of E-bikes, electric wheelchairs, and mobility scooters will not be allowed

### DDA Compliance Considerations

The materials and specifications selected for the path will influence the Disability Discrimination Act (DDA) compliance outcomes of the path. As such, GISC needs to determine how accessible they want the path to be before confirming specifications, design grade limits and accurate costing. A DDA compliance audit is recommended once the path concept design is complete to determine if Council is happy with the DDA accessibility achieved.

**Trail Path Summary Recommendations:**

1. Trail length is maintained at 35.5km, subject to budget availability;
2. Increase the path width to a nominal 3m width where possible;
3. Construction costs of the path to be increased to \$80 per lineal metre;
4. Removal of rail and sleeper costs are to be increased to \$9 per lineal metre;
5. During construction, the contractor is to keep aside a proposed quantity of good-condition sleepers/transoms and rail for GISC's future use;
6. Council to confirm that the entire NERT path surface is to be unsealed; and
7. Council to consider DDA compliance for the rail trail, and what elements are allowable on the trail.

### 3.1.2 Bridges

There are 14 bridges along the Ben Lomond to Glen Innes section ranging in size from 4 metres to 116 metres and can be broken down as:

- 5 Timber On-formation (116m longest);
- 1 three-span steel and brick to retain;
- 6 single-span replacements; and
- 2 potential double-span replacements.

The NERT final report scoping document recommends retaining existing bridges “on the assumption that they are structurally sound pending a structural engineering assessment to confirm their capability to carry trail users” (NERT final report 2021, p. 16). Furthermore, the scoping document highlights the potential loss of an essential part of the rail trail experience due to the bridge’s heritage and convenience value.

As part of the NERT final report body of work, Wood Research and Development (WRD) were engaged to conduct Bridge Level 2 inspections on the 5 major timber bridges, 1 three-span steel and brick bridge and the Crotty Road brick overpass bridge along the Ben Lomond to Glen Innes section. The following is the overall summary of the Condition State Rating (CSR, with CSR 1 being the best quality, and CSR 5 the poorest quality) for each bridge:

1. Old Ben Lomond Rd Timber Bridge (minor): Overall CSR 4
2. Manrowan Creek Timber Bridge (major): Overall CSR 4
3. Upper Williams Timber Creek Bridge (major): Overall CSR 4
4. Williams Creek Timber Bridge (major): Overall CSR 4
5. Beardy Waters Timber Bridge (major): Overall CSR 4
6. Stonehenge Creek Steel and Brick Bridge: Overall CSR 3: and
7. Crotty Road Brick arch Overpass: No Rating was given

The report recommends providing the most extended design life (75-100 years) by installing a newly treated glulam superstructure and deck with a handrail system on top of the restored existing substructure.

It is worth noting that there are a range of substructure options available beyond the proposed glulam, including pre-fabricated options. It is acknowledged that WRD works closely with the refurbishment of timber bridges using repaired timber and new glulam elements, but this may not always be the most optimal solution.

After reviewing the NERT scoping document bridge treatments and associated forecasted costs, the following Table 3 was developed based on the learnings from the Tweed Rail Trail. It is important to note that the NERT report provides minimal detail on the condition of bridges that are not captured in Appendix 3: Bridge Report by WRD. Furthermore, there is no detail on the heritage status of the bridges or local hydrology requirements. As such, the figures detailed below are subject to site inspections, and a quantity surveyor should be engaged to conduct a formal review.

**Table 3 - NERT bridge treatment review**

No.	NERT Scoping Report Detail	Bridge Type	Report Treatment Recommendation	Report Cost Estimate	NSW PW Treatment Recommendations	NSW Treatment Cost Estimate	Difference
1	20m bridge (assume can't use abutment or pier)	Unspecified	Replace with similar	\$80,000.00	On-formation prefab bridge replacement	\$122,500.00	-\$42,500.00
2	8m Old Ben Lomond Timber Bridge	Unspecified	Prefab bridge replacement	\$32,200.00	On-formation prefab bridge replacement	\$74,000.00	-\$41,800.00
3	2m Bridge with Concrete abutments to reuse	Timber with concrete abutments	Replace with similar	\$8,000.00	Potential bridging slab or box culvert	\$15,000.00	-\$7,000.00
4	51m Manrowan Creek Timber Bridge	Timber	Rebuild timber bridge	\$523,250.00	Bypass with 1-span prefab bridge	\$138,300.00	\$384,950.00
5	5m steel timber bridge to retain	Timber with steel transoms and brick abutments	Deck and balustrade only	\$30,000.00	On-formation deck and balustrade – assume structure suitable	\$30,000.00	0
6	15m Upper Williams Timber Creek Bridge (brick abutment)	Timber with brick pier	Rebuild timber structure on brick pier	\$186,875.00	Bypass with 2-span prefab bridge	\$162,114.00	\$24,761.00
7	5m bridge	Timber	Replace with similar	\$20,000.00	On-formation box culvert	\$45,000.00	-\$25,000.00
8	5m bridge (use abutments)	Timber with brick abutments	Deck and balustrade only	\$30,200.00	On-formation bridge (report assumes abutments suitable)	\$38,000.00	-\$7,800.00
9	25m Williams Creek Timber Bridge	Timber	Rebuild timber bridge	\$258,750.00	Bypass with 2-span prefab bridge	\$180,555.00	\$78,195.00
10	116m Beardy Waters Timber Bridge	Timber	Rebuild timber bridge	\$948,750.00	Bypass with 2-span prefab bridge and additional culverts.	\$280,878.00	\$667,872.00
11	6m bridge	Timber	Replace with similar	\$24,000.00	On-formation prefab bridge replacement	\$88,000.00	-\$64,000.00
12	15m Stonehenge creek bridge	Steel transoms, brick abutments and piers	Deck and balustrade only	\$123,825.00	Bypass with 1-span prefab bridge, OR deck and balustrade (which ever lowest cost)	\$121,895.00	\$1,930.00
13	15m Bridge (minor repairs and redeck only)	Steel transoms, brick abutments and piers	Deck and balustrade only	\$123,625.00	Assumes minor repairs, deck and balustrade only.	\$130,000.00	-\$6,375.00
14	5m Bridge (Reuse abutments)	Concrete abutment, no detail on transoms and decking	Replace with similar	\$20,000.00	On-formation prefab bridge replacement on existing abutments	\$38,000.00	-\$18,000.00

A	Bridge Demolition (demo included in WRD report but not in other bridges)				Demolition costs for on-formation bridge replacements.	\$56,000.00	-\$56,000.00
B	Crotty Bridge Overpass (Assumes no money needed, however WRD report states it will need minor repairs)	Brick arch structure	No detail beyond 'minor repairs'		Repair work to ensure no falling material risk to trail users.	\$2,500.00	-\$2,500.00
	Total Saving						\$886,733.00

### **Bypasses:**

Based on NSW PW's experience and learnings from the Tweed Rail Trail, it is possible to maintain the user experience of the trail whilst reducing initial overall costs, through the use of bridge bypasses. Bypassing the major timber structures with a parallel path exposes the users to a visual perspective of the bridge's late 19<sup>th</sup> century engineering heritage. Furthermore, the topography of the Ben Lomond to Glen Innes section provides an opportunity to reduce project costs due to the more level crossings. GISC can rebuild the timber bridges, and the path can be returned to on-formation later, if necessary, when further funding becomes available. The Tweed Rail Trail adopted this same bridge treatment methodology for timber bridges deemed unfeasible to rebuild within the available budget and converted these to a bridge bypass with the potential to rebuild on-formation later. In these cases, the existing bypassed bridge will require signage and suitable barriers at either end to manage the risk of rail trail users getting too close to these structures.

The Tweed Rail Trail Specification also required that any sections of the trail that pass across waterways (e.g. sections where bridges are bypassed, and a low-level bridge is constructed across the permanent waterway) the pathway was to be constructed from reinforced cement concrete. This construction type of pathway will apply to any pathway at or below the 1 in 20-year ARI level for a particular waterway or drainage channel. It is recommended that the NERT adopt a similar specification.

### **Bridge Loading and Handrail Width:**

Maintaining the crowd loading of 5kPa load rating and a handrail width of 2.5m, as highlighted in the report, is recommended. In doing so, it allows light-duty service vehicles to cross the bridges for maintenance and easy access for NSW ambulance vehicles up to 4500kg GVM and a width of less than 2.5m (with side mirrors retracted) to allow direct patient retrieval for the entire rail trail (supported by ambulance turn-around bays along the trail).

If horses are allowed on the trail, then the treatment of waterway crossings will need to be reviewed. Considerations will need to be given to the structure's impact ratings, the decking width and balustrade handrail height to ensure safe use for the rider, horse, and other users.

### **Summary Recommendations:**

1. There is currently insufficient budget to rebuild all bridges on-formation;
2. Cost savings of approx. \$886,733 could be achieved by bypassing all 5 major timber bridges;
3. Minor on-formation bridge replacement forecast costs in the NERT final report are too low and are recommended to be increased;
4. Where possible, for the shortest on-formation crossings, a pre-cast culvert solution is recommended to reduce costs;
5. Minor funds are to be allocated to the Crotty Bridge overpass to make it safe before allowing trail users to travel under the structure;
6. The necessary reviews are conducted to confirm if any of the bridges are heritage-listed, and a Conservation Management Plan and a Statement of Heritage Impact is prepared for the rail trail, which will include recommendations to record the details of any bridges that will be fully or partially demolished;
7. Depending on the selected procurement strategy, some survey and minimal geotechnical investigations may be required before advertising a construction tender; and
8. It is recommended that a dedicated bridges specification is developed to ensure the final constructed results meet the quality, aesthetics, maintenance, and loading requirements.

### 3.1.3 Trailheads, Amenities, Wayfinding and Signage

#### Trail Heads and Amenities

4 Four trailheads are proposed for the Ben Lomond to Glen Innes section of the Trail: Glen Innes Station; Stonehenge Recreational Reserve; Glencoe Station; and Ben Lomond Station. It is noted that the NERT scoping report refers to 5 five trailheads with the inclusion of Stonehenge Trailhead, however the Works Table does not allocate any funds to the Stonehenge Trailhead, nor is a drawing supplied in Appendix 4 of the report. It is assumed that the Stonehenge Trailhead is not included in the scope due to its proximity to the Stonehenge Recreational Reserve.

From reviewing the Trailheads, the following table was developed which includes recommendations for a minimal amount of amenities at the trail heads to enhance the rail trial user experience:

No.	NERT Scoping Report Detail	Report Cost Estimate	NSW PW Treatment Recommendations	NSW PW Treatment Cost Estimate	Difference
1	<p>Glen Innes Station</p> <p>Access trail off northern end of station platform. (See Trailhead plan – Appendix 3).</p> <ul style="list-style-type: none"> <li>• Install trailhead sign (brown chevron – single sided) in 3 locations (\$3,000).</li> <li>• Install 1 Trail Directional Marker (Straight Ahead arrow on both faces) (\$600).</li> <li>• Prepare and install trailhead map panel (\$5,500).</li> <li>• Upgrade existing bitumen carpark (30m x 20m) (\$18,000).</li> <li>• Construct short connecting trail (ramps down) from parking area to trail (10 metres) (\$600).</li> </ul>	\$27,700.00	<p>Provide onsite shading through an additional shelter, concrete slab and picnic table.</p> <p>Keep section of rail and sleepers in front of Railway station to allow for future heritage presentation.</p> <p>Due to budget constraints, keep initial scope to a minimum.</p>	\$47,400	-\$20,00.00
2	<p>Stonehenge Recreational Reserve</p> <ul style="list-style-type: none"> <li>• Install trailhead sign (brown chevron) on New England Highway (\$1,600).</li> <li>• Prepare and install trailhead map panel (\$5,500).</li> <li>• Install trailhead name sign (\$1,000).</li> <li>• Construct gravel carpark (30m x 30m) (\$22,500).</li> <li>• Construct connecting trail from parking area to trail (500 metres) (costed in WI 83).</li> <li>• Install 3 Trail Directional Markers (straight ahead arrows on both faces) on connecting trail. One to be installed at junction of connecting trail and road to gun club; the other 2 between this location and the rail trail (\$1,800).</li> </ul> <p>PLUS CONNECTION TRAIL</p> <ul style="list-style-type: none"> <li>• trail to Stonehenge trailhead (500 metres)</li> </ul>	\$50,150.00	<p>No change</p> <p>Due to budget constraints, keep initial scope to a minimum.</p>	\$50,150.00	0

3	<p>Glencoe Station</p> <ul style="list-style-type: none"> <li>• Install trailhead signs (brown chevron) on New England Highway – 2 locations single sided (\$2,000).</li> <li>• Prepare and install trailhead map panel (\$5,500).</li> <li>• Install trailhead name sign (\$1,000)</li> <li>• Construct gravel carpark (40m x 15m) (\$15,000).</li> <li>• Install picnic table (\$8,000).</li> <li>• Construct short connecting path from parking area to trail (20 metres) (\$650).</li> </ul>	\$32,150.00	<p>Provide onsite shading through an additional shelter and concrete slab.</p> <p>Keep section of rail and sleepers to allow for future heritage presentation.</p> <p>Due to budget constraints, keep initial scope to a minimum.</p>	\$44,150.00	-\$12,000.00
4	Ben Lomond - No cost or drawing supplied	\$0	<p>It is assumed no scope has been allocated to the Ben Lomond Trailhead as it's within the neighbouring LGA and will be completed within the Ben Lomond to Armidale section</p> <p>Keep section of rail and sleepers to allow for future heritage presentation.</p>	\$0	\$0
Total Difference					-\$32,000.00

The review found limited ability to increase the Trailhead scope while meeting the BLER budget constraints. As such, it's essential to ensure that the initial scope complements the later potential stages of development. An example of this is shown in Figure 1 below, where the Tweed Rail Trail has kept sections of rail on-formation at key heritage locations (e.g. former railway stations), intending to eventually install a potential rail vehicle as an attraction for users.



**Figure 1 – Example of kept rail and sleepers to preserve heritage at Murwillumbah Station (Tweed Rail Trail).**

It is recommended that the GISC keep sections of the on-formation railway at the Trailheads to allow for the future display of heritage items.

### Wayfinding and Signage

The NERT will require the development of a coherent system for wayfinding through signage (e.g. distance to key points, village centres etc.) to ensure users of the Rail Trail can navigate the trail and key sites e.g. local businesses and town/village centres and key open spaces. A specification will need to be developed that provides a list of instances in which signage is required, including regulatory signs, trail name signs, warning signs, road name signs at level road crossings, direction signs to local attractions, Rail Trail etiquette signs, private property – no trespassing signage, trailhead signs and other signs where required.

Furthermore, the wayfinding and signage system will need to be developed to ensure that it can be extended to the future planned stages and ensure an overall identity for the full extent of the recreational trail is adopted.

It can be identified that an allocation has been made to supply and install signage for the trailheads and road crossings. However there appears to be no budget consideration for the development of the all specifications that will need to speak to the full extent of the trail.

No.	NSW PW Treatment Recommendations	NSW PW Treatment Cost Estimate
1	It is acknowledged that signage is factored into road crossings and trailheads. However, there is no cost to develop the overarching wayfinding and signage specification. This is to be added	\$25,000
	Total Difference	-\$25,000.00

### **Trailhead and Wayfinding Summary Recommendations:**

1. Provide onsite shading at Glen Innes Trailhead through an additional shelter, concrete slab and picnic table;
2. Provide onsite shading at Glencoe Station through an additional shelter and concrete slab;
3. Keep sections of railway (rail and sleepers) on-formation at key locations such as Glencoe Trailhead and Glen Innes Station to allow for future heritage presentation;
4. Keep overall Trailhead scope to a minimum for this initial construction due to budget constraints;
5. Review the toilets and drinking water facilities available at key nodes to determine if further infrastructure is needed;
6. Conduct a DDA compliance audit on the proposed Trailhead designs, existing toilets and drinking facilities to determine if upgrades are part of the initial NERT scope or future planned works when later funding becomes available;
7. Develop an overarching wayfinding and signage specification that provides an overall identity for the full extent of the NERT once adopted (not just GISC-specific); and
8. Increase budget allocation to allow the development of signage specifications.

### 3.1.4 Fencing & Corridor Leasing

The NERT scoping document proposes the following three options for fencing the 35.5km length trail with Option One being the preferred option:

1. A 6m wide corridor is fenced in for the entirety of the trail excluding town sections of Glen Innes;
2. A temporary fence is erected that is moved seasonally to allow stock to graze within the corridor through temporary leases; and
3. A do-nothing approach which will see the trail open as it currently is and where fencing does not exist, stock will be able to walk freely onto the trail.

It is noted that implementing the preferred Option One results in the greatest upfront cost of \$1,007,500.

For the Tweed Rail Trail, a case-by-case approach was adopted to minimise upfront fencing costs to the project. New fencing was only erected where existing livestock could enter the corridor freely and damage the trail or where an adjoining landowner reached out to the council and requested a fencing solution.

Where fencing was in good to moderate condition and could keep livestock off the corridor, no action was taken. Where no fence existed, the landowner could enter a licence with Council for a fee which would transfer liability to the landowner and give them formal access to the area for use. If accepted, the fence was erected closer to the corridor; if not, the fence was erected on the existing boundary.

Based on our recent experience, it is recommended that a case-by-case approach is adopted, and the priorities are based on where livestock can enter the corridor and where existing infrastructure is within the corridor. The proposed Option One relies on all landowners entering an agreement with Council, which based on experience, is unlikely. It's also important to consider that a 6m wide corridor could negatively impact the users' experience versus a full-width section, which includes the opportunity for additional planting, or creating rest stops along the trail.

From reviewing the NERT scoping document costings for fencing the following table was developed:

No.	NERT Scoping Report Detail	NSW PW Recommendations	NSW PW Comment	Cost Difference over 35.5km
1	\$15 per lineal metre to erect fencing	<p>\$23 per lineal metre to erect fencing</p> <p>\$9 per lineal metre to remove old, damaged fence</p> <p>\$7 per lineal metre to clear regrowth as required</p>	Fencing is to be case-by-case that has provisional costs for the erection of new fencing, removal of old damaged fencing needing to be removed and clearing of regrowth that is compromising the existing fence	\$0 – Recommend maintaining the current budget allocation of \$1,007,900

It was found that the NERT scoping report \$ rate per lineal metre of fencing needed to be higher; furthermore, there is no provisional consideration for when a fence is beyond repair and needs to be removed before new fence installation and/or clearing of regrowth on the fence.

It is recommended to maintain the total allocation of \$1,007,500 and redistribute as follows:

- 80% for new fencing (\$806,000)
- 12% for repairs, removal and clearing (\$120,900)
- 8% for screening plants, such as Lilly Pillies (\$81,000)

Any allocated provisional fencing funds that are not spent are recommended to be redistributed to additional items at trailheads, such as outdoor furniture or water bubbler stations.

### **Fencing and Corridor Leasing Summary Recommendations:**

- 1.** Manage the fencing on a case-by-case basis. Focus on areas where livestock can enter the trail or where residents have raised a desire to have fencing;
- 2.** Keep the current budget allocation of \$1,007,500 to erect fencing, including fencing repairs, removal of the old fence, clearing of regrowth on fence lines, and screening plants; and
- 3.** Engage landowners early in the project to develop the fencing scope. The fencing scoping development takes time and rushing negotiations with the landowners will negatively impact the outcomes.

### 3.1.5 Road Crossings

The NERT scoping document captured a total of eight level road crossing along the Ben Lomond to Glen Innes section. It is assumed that all level crossings have had the in-road rail removed, if not this will be an additional cost to the project that has not been considered.

Based on NSW PW experience, it was found that chicane level crossings provided a higher level of pedestrian control as it forced trail users to break their train of thought and focus on the road crossing. Attention to the road crossings is particularly important for groups or families with young children as it slows users running or cycling towards the road. The chicanes are to be suitably positioned to give the road user and trail user maximum time to see each other. Furthermore, the chicane should be offset from the road to allow multiple riders or a family to wait in a safe zone for a vehicle to pass without spilling onto the road.

It is noted that there is one level crossing over the New England Highway. This is a **high-risk** location, and consultation with Transport for NSW will be required when determining the final solution. The ultimate risk mitigation solution would be to remove the need for pedestrians to cross at level with an overpass; however, there is insufficient funding within the project budget to accommodate the investigation, design and construction of such a solution. As such, on-level solutions will need to be investigated.

From reviewing the drawing in Appendix 1 of the NERT scoping document (p137), as a minimum, it is recommended that:

- 2 chicanes are added either side of the highway to slow trail users as they approach the road;
- A Road Safety Audit (RSA) is undertaken with Transport for NSW;
- Seek to have the centre lines changed from overtaking lanes to double lines to stop vehicle overtaking at the crossing location;
- Investigate into a possible centre refuge island that has enough space to allow for a bike to wait; and
- Install a traffic counter as soon as possible to capture robust data and help inform the discussions between GISC and Transport for NSW.



**Figure 2 - New England Highway crossing location**

From reviewing the road crossings, the following table was developed. Please note the recommendations within this report are from what NSW PW has learned from other trails and further engineering review is necessary.

**Table 4 - Road Crossing Review**

No.	NERT Scoping Report Detail	Report Forecast	NSW PW Recommendations	Recommended Forecast	Difference
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1	<p>Road crossing – Inn Road.</p> <p>Install “road ahead” signs on both sides (\$400).</p> <p>Install “trail crossing” sign (1 location) (\$600).</p> <p>Install “trail crossing on side road” sign (2 locations) (\$1,200).</p> <p>Install “Give Way” sign (southern side of road) (\$400)</p> <p>Install trail user chicane and management access gate (northern side of road). Set in concrete/asphalt apron for ease of maintenance (\$3,540)</p> <p>Install pipe culverts under trail at junction with road (both sides of road) (\$3,000)</p> <p>Remove existing fence – north side only (\$200).</p> <p>Retain/renovate/repaint distance peg (646 km) (\$200).</p>	\$9,540.00	<p>Chicane to be installed both sides unless,</p> <p>If Ben Lomond to Glen Innes scope stops on the northern side of Inn Road (assume this to be the case) one chicane will be ok with a bollard across to signify the end of the track is suitable.</p>	No Change	0
2	<p>Road crossing – Old Ben Lomond Road.</p> <p>Install “road ahead” signs on both sides (\$400).</p> <p>Install “trail crossing” signs on both sides of trail (\$1,200).</p> <p>Install trail user chicanes and management access gates (both sides of road). Set in concrete/asphalt apron for ease of maintenance (\$7,080).</p> <p>Remove existing fence (\$200).</p>	\$8,880.00	No change	No Change	0
3	<p>Road crossing – Ingle Vale Road.</p> <p>Install “road ahead” signs on both sides (\$400).</p> <p>Install “trail crossing” signs on both sides of trail (\$1,200).</p> <p>Install “Give Way” sign (northern side of road) (\$400).</p> <p>Install trail user chicane and management access gate (southern side of road). Set in concrete/asphalt apron for ease of maintenance (\$3,540).</p> <p>Install pipe culverts under trail at junction with road (both sides of road) (\$3,000)</p> <p>Remove existing fence (\$200).</p>	\$8,740.00	Recommend chicane on both sides of the road, not just southern	\$12,280.00	-\$3,450.00
4	<p>Road crossing – Munsies Road.</p> <p>Install “road ahead” signs on both sides (\$400).</p> <p>Install “trail crossing” sign (1 location) (\$600).</p> <p>Install “trail crossing on side road” sign (2 locations) (\$1,200).</p>	\$9,340.00	Recommend chicane on both sides of the road.	\$16,420.00	-\$7,080.00

	<p>Install "Give Way" sign (southern side of road) (\$400).</p> <p>Install trail user chicane and management access gate (northern side of road). Set in concrete/asphalt apron for ease of maintenance (\$3,540).</p> <p>Install pipe culverts under trail at junction with road (both sides of road) (\$3,000).</p> <p>Remove existing fence (\$200).</p>				
5	<p>Road crossing – New England Highway (High Risk)</p> <p>Install "road ahead" signs on both sides (\$400).</p> <p>Install "trail crossing" signs on both sides of trail (\$1,200).</p> <p>Install "Stop" signs on both sides (\$400).</p> <p>Install trail user chicanes and management access gates (both sides of crossing but at some distance from the road). Set in concrete/asphalt apron for ease of maintenance (\$7,080).</p> <p>Install pipe culverts under trail at junction with road (both sides of road under new embankments (\$6,000).</p> <p>Remove existing fence (\$200).</p> <p>Construct new trail (110 metres) on eastern side of crossing (see WI 16 for start point). This work will include a pipe under the embankment where the embankment crosses a drain line running parallel with the railway formation (\$7,600).</p> <p>Construct new trail (25 metres) on western side on 2m high embankment (\$1,500).</p> <p>Install barriers to redirect users – both sides of crossing (\$2,000).</p>	\$26,380.00	<p>Add chicanes on either side of New England Highway.</p> <p>Keep the railway line on-formation between the two barriers to encourage trail users to use the new alternative crossing track instead of a shortcut.</p> <p>Highly recommend installing a traffic counter as soon as possible to determine the appropriate traffic solution required.</p> <p>Ideally want an overpass solution (or potentially an underpass), however insufficient budget and warranted traffic data.</p> <p>Consultation with TforNSW will be required.</p> <p>Allow for additional engineering including Road Safety Audit.</p> <p>Seek to have the centre lines changed from overtaking lanes to double lines to stop vehicle overtaking at the crossing location.</p> <p>Install suitable signage for both trail users and motorists, which may also include flashing warning lights.</p>	\$43,460.00	-\$17,080.00
6	<p>Road crossing – West Pandora Rd.</p> <p>Install "road ahead" signs on both sides (\$400).</p> <p>Install "trail crossing" signs on both sides of trail (\$1,200).</p> <p>Install trail user chicanes and management access gates (both sides of road). Set in concrete/asphalt apron for ease of maintenance (\$7,080).</p> <p>Install pipe culverts under trail at junction with road (both sides of road) (\$3,000).</p> <p>Remove existing cross fence (\$200).</p>	\$11,800.00	No Change	No Change	0
7	<p>Road crossing – Fawcett Rd.</p>	\$12,080	No Change	No Change	0

	<p>Install “road ahead” signs on both sides (\$400).</p> <p>Install “trail crossing” signs on both sides of trail (\$1,200).</p> <p>Install trail user chicanes and management access gates (both sides of road). Set in concrete/asphalt apron for ease of maintenance (\$7,080).</p> <p>Install pipe culverts under trail at junction with road (both sides of road) (\$3,000).</p> <p>Remove existing cross-fences (\$400).</p>				
8	<p>Road crossing – Oliver St.</p> <p>Install “road ahead” signs on both sides (\$400).</p> <p>Install “Give Way” signs on both sides (\$400).</p> <p>Install “trail crossing” signs (3 locations) (\$1,800).</p> <p>Remove existing cross-fence (southern side) (\$200).</p> <p>End new boundary fencing from Stonehenge Trailhead.</p>	\$2,800.00	Recommend chicane on both sides of the road.	\$9,880.00	-\$7,080.00
	Total Difference				-\$34,780.00

### Road Crossing Summary Recommendations:

1. Chicanes are recommended for all road crossings;
2. GISC or an approved representative should discuss crossings solutions for the New England Highway with Transport for NSW and undertake a Road Safety Audit;
3. A traffic counter is installed on the New England Highway crossing as soon as possible to capture the quantum of vehicles passing and at what time, to help inform the crossing solution;
4. Have the centre lines changed from overtaking lanes to double lines to stop vehicles overtaking at the crossing location;
5. Investigate a possible centre refuge suitable for bikes and pedestrians (including prams). However, the budget does not accommodate for the construction of such a solution; and
6. The budget allocation for road crossing is to be increased by an additional \$34,780 to allow for chicanes and additional engineering consultation with Transport for NSW.

## 3.2 Project Management, Design, and Approvals

### 3.2.1 Project Management

From reviewing the Works Table within the NERT scoping document it can be identified that an allocation of 5% for Project Management has been applied to the estimated expenditure **prior to the addition** of the following costs:

- Removal of removal of steel track and sleepers;
- Approvals, permits, applications, designs, specifications, assessments;
- Allowance of additional construction costs for haulage of extra material; and
- Contingency.

5% is a reasonable Project Management cost, however it is recommended that the Project Management allocation be increased so it factors in the management of:

- Cost variances as recommended in Section 3.1 of this report;
- Removal of removal of steel track and sleepers;
- Approvals, permits, applications, designs, specifications, assessments; and
- Consultation with landowners for fencing and consultation with the general community.

**Table 5 - Project management review findings**

No.	NERT Scoping Report Detail	NSW PW Recommendations	Cost Difference
1	\$337,500 for Project Management	\$433,000 for Project Management	-\$95,500.00

For an overall coherent delivery of the NERT project, it is recommended that a consistent Project Manager can drive the project from early-stage investigation, through to handover. Furthermore, involving the Project Manager in community consultation will assist in managing council reputational risks and help ensure a well delivered project that addressed the community consultation where practical to do so, resulting in outcomes that benefits both the community and Council.

### 3.2.2 Council Governance and Management

The review identified that no budget allocation has been made to allow the charging of Council officers against the NERT project. From other experiences, Council costs can factor for an additional 5% of the total expenditure to cover, oversight, engineering & environmental review, site surveillance and key involvement in the early investigation works. An additional 5% of the total expenditure is recommended to be added against the budget.

Council can choose to co-contribute to the to the BLER funding by covering all their internal staff costs to assist increasing the available project budget.

### 3.2.3 Design and Approval

The NERT scoping document recommends 2.5% of the project expenditure is to cover all approvals, permits, applications, designs, specifications and assessments. Based on NSW PW experience this 2.5% is insufficient and should be increased to 4% for design and an additional 1% for project approvals. Based on lessons learned from previous projects, an insufficient design budget presents significant risks for the construction due to poor design outcomes and can often lead to expensive rework.

**Table 6 - Design and Approval budget allocation review and findings**

No.	NERT Scoping Report Detail	NSW PW Recommendations	Cost Difference
1	\$168,770 (Approx. 2.5% total of estimated expenditure) for:  approvals, permits, applications, designs, specifications and assessments	\$364,710 (Approx. 4% total of estimated expenditure) for:  design consultant (including hydrology), survey and geotechnical Investigations  \$117,000 (Approx. 1% total of estimated expenditure) for:  Organising of lease and legal matters, amendment to LEP, REF consultant, Aboriginal Cultural Heritage assessment, Statement of Heritage Impacts, Biodiversity assessment	-\$312,940.00

### 3.2.4 Funding Deed

From reviewing the supplied information, a final draft funding deed could not be located. As such, it is important to confirm with the funding body that the following can occur prior to finalising the deed:

- Allocation of funds to cover Council staff costs. It is important to confirm that Council staff costs are eligible to be charged against the BLER if the work charge has occurred because of the delivery of the NERT project and is charged before project completion; and
- Allocation of funds to cover Council-owned material, such as a quarry material used in the project. It is important to confirm that Council can recover costs for items that could be deemed as "in-house" such as the cost to use materials supplied from a council owned quarry to build the trail.

From review, all costs are likely to be eligible to be recouped as long as they are only incurred because of the rail trail project, and the recouping of funds is before the project completion. Further information can be located here: [Bushfire Local Economic Recovery Fund Program Guidelines](#)

It is important to note that the NERT project costs provided in the Works Table has not considered Council governance and oversight costs. The project estimate in Section 5.2 assumes that council will not co-contribute, and the costs incurred will be allocated against the BLER funded project.

## 4. Project Program

NSW PW has developed a draft project program as the basis for the Cashflow Estimate. It is contained in Appendix A – High Level Program Summary. High level milestones from the program are as follows:

- Deed Execution End March 2023;
- REF Determination End November 2023;
- Complete Masterplan Mid July 2023;
- Complete Design End October 2023; and
- Complete Construction and Project Handover End October 2024.

## 5. Project Estimate

### 5.1 Identified additional costs summary

From reviewing the NERT scoping document, numerous elements have been identified as having insufficient forecasts. However, there is an opportunity to reduce costs through the bypassing of major bridges. It is important to note that due to the structuring of the NERT scoping report Works Tables, it is difficult to separate out all the potential additional costs. As such, the table below is a guide to highlight the major identifiable cost differences. Please refer to Table 8 in Section 5.2 Project Estimation for a full project estimate.

Table 7 below summarises the recommended forecasted costs.

**Table 7 - Key identified additional costs to be expected**

No.	Item	NERT Scoping Report Figure	NSW PW Recommendations	Cost Difference	Comment
1	Trail Path	\$60 per metre	\$80 per metre	\$ 710,000.00	Refer to section 3.1.1
2	Removal of Rail & Sleepers	\$8 per metre	\$9 per metre	\$ 53,250.00	Refer to section 3.1.1
3	Bridge Treatments	\$ 2,409,475.00	\$ 1,522,742.00	-\$ 886,733.00	Refer to section 3.1.2
4	Trailheads	\$ 110,000.00	\$ 142,000.00	\$ 32,000.00	Refer to Section 3.1.3
5	Signage & Wayfinding		\$ 25,000.00	\$ 25,000.00	It is acknowledged that signage is factored into road crossings and trailheads. However, there is no cost to develop the overarching wayfinding and signage specification. This is to be added
6	Road Crossings	\$ 97,640.00	\$ 132,420.00	\$ 34,780.00	Refer to Section 3.1.5
7	Traffic Management	\$ 16,000.00	\$ 21,000.00	\$ 5,000.00	Recommend increasing
8	Project Management	\$ 337,500.00	\$ 433,000.00	\$ 95,500.00	Refer to Section 3.2.1
9	GIS/SC Project Governance	\$ -	\$ 470,000.00	\$ 470,000.00	Refer to Section 3.2.2
10	Design and Project Approvals	\$ 168,770.00	\$ 481,710.00	\$ 312,940.00	Refer to Section 3.2.3
11	Site Establishment	\$ -	\$ 100,000.00	\$ 100,000.00	No site establishment was identified in the NERT report
12	Clearing of vegetation	\$ 115,840.00	\$ 195,250.00	\$ 79,410.00	An increase from an average rate of \$3.26 to \$4.50 per metre
13	One-off removal of rubbish from the site	\$ -	\$ 18,000.00	\$ 18,000.00	
14	Erosion and Sediment Control	\$ -	\$ 124,250.00	\$ 124,250.00	An additional cost to manage the entire site, including waterway crossings.
15	Insurances - Works & PL		\$ 25,000.00	\$ 25,000.00	
16	Contractor site supervision and Management	\$ -	\$ 350,000.00	\$ 350,000.00	It could be assumed that all figures in the report consider overheads, however with recent inflation across construction, it is recommended to increase.
17	Stock Crossings	\$ 140,000.00	\$ 160,000.00	\$ 20,000.00	Recommend increasing to accommodate material and labour increases
	Total:			\$ 1,568,397.00	Additional funds required

## 5.2 Project Estimation

From reviewing the project scope as defined in the NERT report and applying NSW PW-shared learnings from delivering the Tweed Rail Trail, it is recommended that a total of \$10,796,288.00 is set as the total project budget.

**Table 8 - NERT Project Estimation**

NEW ENGLAND RAIL TRAIL						
Ben Lomond to Glen Innes			Distance (km)		35.5	Allocated BLER Amount of \$8,721,095
Item/Phase	Description	Quantity	Unit	Rate \$	Cost \$	Comment
<b>ESTIMATE SUMMARY</b>						
1	INDIRECT COSTS	item	1		\$ 1,384,710	
2	DIRECT COSTS	item	1		\$ 7,252,320	
	<b>TOTAL</b>				<b>\$ 8,637,030</b>	
	Contingency based on limited \$8,721,095 BLER budget	%	0.01		\$ 84,065	After adjusting all other costs, contingency is the remaining money from the grant application. Not enough, currently less than 1%. Recommend increasing to 25% due to increased number of uncertainties
	Recommended 25% contingency	%	25.0		\$ 2,159,258	Recommend 25% due to increase number of uncertainties.
	<b>TOTAL Budget Recommended</b>				<b>\$ 10,796,288</b>	
	<b>INDIRECT COSTS</b>				<b>\$ 1,384,710</b>	
<b>5% Council</b>	<b>Project Governance</b>				<b>470,000</b>	
	Project Director Oversight	1	no	200,000	200,000	GISC Project Director oversight
	Site Surveillance	1	no	130,000	130,000	On-ground site surveillance
	Technical input and review	1	no	140,000	140,000	Technical staff input
<b>5% Project</b>	<b>Management</b>				<b>433,000</b>	
	Project Management - Design & Procurement	1	no	190,000	190,000	
	Project Management - Contract Management & Site Surveillance	1	no	190,000	190,000	
	Community Consultation	1	no	53,000	53,000	
<b>1% Project</b>	<b>Approvals</b>				<b>117,000</b>	
	Bill to Close Railway	1	no	5,000	5,000	
	Organise Lease - Legal	1	no	14,000	14,000	
	Amendment to LEP	1	no	10,000	10,000	
	REF Consultant	1	no	22,000	22,000	
	Aboriginal Cultural Heritage Assessment	1	no	22,000	22,000	
	Statement of Heritage Impacts	1	no	22,000	22,000	
	Biodiversity assessment (terrestrial and aquatic)	1	no	22,000	22,000	
<b>4% Design</b>					<b>364,710</b>	
	Design Consultant	1	no	262,500	262,500	
	Survey	1	no	43,605	43,605	
	Geotechnical Investigations	1	no	43,605	43,605	
	Signage & Development	1	no	15,000	15,000	Overall signage and wayfinding specification development
	<b>DIRECT COSTS</b>				<b>7,252,320</b>	
	<b>Preliminaries</b>				<b>1,132,000</b>	
1	Site Establishment	1	no	100,000	100,000	Site establishment costs added
2	Cleaning of Vegetation	35.5	km	5,500	195,250	Includes increased rate (low to moderate)
3	Removal of Rubbish	1	nom	18,000	18,000	Add one-off removal of unidentified rubbish
4	Erosion and Sediment Control	35.5	km	3,500	124,250	Erosion and Sed control costs added
5	Remove Rails and Sleepers	35.5	km	9,000	319,500	Applied increased rate from \$8 to \$9 per m and assumes on sale
	Insurance - Works & PL	1	no	25,000	25,000	
	Contractor Site Supervision & Management	1	no	350,000	350,000	
	<b>Core Construction Items</b>				<b>6,120,320</b>	
8	Bridge Treatments	See Report Section 3.1.2			1,523,000	Updated to reflect revised costs
9	Drainage	35.5	km	8,000	284,000	
10	Path construction	35.5	km	80,000	2,840,000	Increased from \$60 to \$80 per m
11	Trailheads inc furniture	1	nom	142,000	142,000	Includes recommended increase
12	Road Crossings inc signage	1	nom	132,420	132,420	Includes recommended increase
13	Traffic Mgmt.	35	Day	600	21,000	
14	Fencing New	40.30	km	20,000	806,000	\$20/linear Meter (including contractor Margin)
15	Repair or remove old fence	7.56	km	9,000	60,450	\$9/linear Meter (including contractor Margin)
16	Clear fence regrowth	7.56	km	7,000	60,450	\$7/linear Meter (including contractor Margin)
17	Screening Plants	1	nom		81,000	8% of total fencing budget
18	Stock Crossings	21	no	7,619	160,000	
19	Signage	35.5	km	282	10,000	Additional signage recommended for supply
	<b>Cost per km</b>				<b>\$304,121</b>	

It can be identified in Table 8 above, that the NSW PW desktop analysis project estimation with no contingency applied comes in at \$8,637,030, just under the BLER budget requirement of \$8,721,095. However, once a recommended contingency is applied a further \$2,075,133 of funding is necessary. From the Tweed Rail Trail experience, issues will arise, and unforeseen costs will be incurred that will require contingency funding.

25% contingency is recommended to be applied due to the high level of unknown details and assumptions made in the NERT scoping report. Such as unknown hydrology and heritage status for bridges and bypasses, on-formation bridge conditions, water crossing topography, and geotechnical data at bypasses.

### 5.3 Project Cashflow

NSW PW has developed a cashflow estimate based on the current project estimate and program. It is contained in Appendix B Project Cashflow.

## 6. Lessons Learned and Project Risk

Based on NSW PW involvement with other Rail Trail projects within NSW, the following comments are provided in relation to lessons learned and Project risk.

### 6.1 Approvals and Governance

#### 6.1.1 Governance Model and Lease Arrangement

As discussed in Section 2.2, GISC will need to obtain a lease to construct, operate and maintain the Rail Trail. It took approximately 18 months to determine the ownership/lease arrangement for the Tweed Rail Trail section and then longer to complete the negotiation of the 30-year lease. The lease ultimately needed to be finalised to enable construction to start and is not perfect. To date, TfNSW has not had any active involvement with the project nor the design but TSC keeps TfNSW informed of the project progress. Under the lease, TSC is a tenant and is responsible for maintaining the corridor.

NSW PW understands that GISC are progressing their lease negotiations, but we are unaware of the current status of this lease. As such, the timeframe to finalise the lease agreements is uncertain, there is a risk to the timeframe in which the project can start.

Investigations should be undertaken using Council's GIS system to confirm land ownership for the entire corridor along the 35.5km section, including whether any easements exist.

It is recommended that sufficient time is accommodated in the project program to allow for the development of the necessary regulations and the final two-week approval period in parliament.

#### 6.1.2 Funding Deed

The execution of the funding deed for the Tweed Rail Trail took an extended period of time as the funding body needed assurances on the project's viability with respect to the business case, railway closure and land ownership prior to execution. It is understood that this document helps shed light on the projects viability.

#### 6.1.3 Landowner and Community Engagement

TSC undertook adjacent landowner engagement for all properties adjacent to the alignment. There are about 70 adjacent landowners alongside the Tweed Rail Trail. This activity was led by TSC with NSW PW's involvement. TSC worked with the landowners and believe that this is now paying dividends as the project enters construction.

With respect to community consultation, several different information drop-in sessions were held (both in-person and online) and NSW PW assisted with these. Some concerns that were raised by the adjacent landowners included items such as : biosecurity, noise, privacy, vandalism, fencing, and trespassing. These items were discussed at the various community forums, with reference made to the biosecurity report prepared by the Local Land Services for Council, and the experience of other rail trails with respect to potential anti-social behaviour along the trail.

The development and showcasing of a Masterplan is a great opportunity to start stakeholder and community engagement and to gain momentum for the project.

The consultation sessions are recommended to be ongoing and provide further information to the community about the project as it becomes available, including anticipated construction timelines. Those involved from NSW PW on the Tweed Rail Trail learnt that it was important to have landowners and community stakeholders engaged early in the project to bring them along the Project journey.

Furthermore, one-on-one consultation sessions were held with each landowner to discuss potential lease arrangements and fencing requirements. This process took longer than anticipated and the NERT high level program has been developed to provide more accommodating timeframes.

#### **6.1.4 Steering Committee**

For the Tweed Rail Trail, a steering committee was established which included members from each LGA that the full completed 124km Rail Trail would pass through. The members included Tweed Shire, Byron, Lismore City and Richmond Valley Councils, as well as members from NSW PW and Northern Rivers Rail Trail (NRRT) Inc. This committee has been meeting monthly since 2018. It is recommended a similar committee is developed for the NERT, and as more is achieved for other sections, additional members will have more involvement.

#### **6.1.5 Delivery Model**

The Tweed Rail Trail was undertaken as a Design and Construct model. This has been driven by a number of factors including the availability and capability of internal resources to undertake the design, and to allow the market to decide the on-formation vs off-formation debate which was a significant issue for the Tweed Rail Trail.

Given the time involved in closing the railway, obtaining a lease and performing environmental studies, it is recommended that GISC progress with a design process first, followed by a construct only contract. Tenderers should also be given the option of submitting Alternative Tenders.

It is also recommended that GISC engage a single Design Consultant to develop the Masterplan, undertake inspections/investigations and complete the concept and detailed designs.

#### **6.1.6 Preliminary Investigations**

During the Planning and Governance phase, the TSC used this time to undertake preliminary investigations concurrently. This included a substantial amount of survey and completion of their REF which were done internally. The preparation of the REF also required extensive environmental and heritage investigations to be undertaken, including flora and fauna surveys, with particular focus on the Burringbar Range Tunnel (approximately 500m long) which houses glow worms and micro-bats.

The TSC also contracted out inspections of both the steel and timber bridges.

TSC only completed a limited number of geotechnical investigations where the path went off formation for bridge bypasses. Where the alignment was on formation, TSC was confident that over 100years of compaction from the weight of the trains would provide suitable foundation conditions for the Rail Trail design loads.

It is recommended that the corridor be slashed prior to completing these investigations to improve access and allow for better inspections of the existing railway infrastructure.

#### **6.1.7 Concept Design**

TSC developed a concept design to confirm that the costs associated with the trail matched the funding amount, and to determine the most appropriate route considering the terrain. TSC's concept design included almost 20% of the alignment being off-formation which was a combination of bridge bypass sections, and off-formation sections used for historical interpretation. The majority of Tenderers for the D&C Contract adopted this concept design in their tender submissions.

#### **6.1.8 Bridges**

The Rail Trail alignment through TSC comprises of 26 bridges with some being quite small. Early on TSC nominated to bypass some bridges so that they did not have to refurbish them as this was financially more viable. If further funding becomes available at a later date, TSC may refurbish/restore these bypassed bridges.

A similar approach has been recommended in this report.

### **6.1.9 Procurement Lead Times**

TSC's Contractor did not suffer substantial delays beyond the flooding that occurred in the Northern Rivers in February / March 2022, however, the contractor was continually monitoring this and notified us in advance of any potential supply issues. There was not a significant amount of timber available to rebuild bridges, but the contractor secured the supply of timber that they require in advance.

During the Design Phase, GISC should consider whether any long lead items should be purchased in advance of the Construction Contract.

### **6.1.10 Hydrology**

Hydrology was one of the biggest challenges for TSC, as they needed to understand what the parameters were, what level to set the flood immunity at and whether there would be a back-up of flood waters. If there was a back-up, this could cause upstream issues to adjacent properties or infrastructure. Undertaking a hydrology study upfront or at least understanding and completing the modelling upfront would assist. This may be included in the scope of the Design Consultant. It is also noted that existing culverts should be cleared out and drainages checked properly first as an upfront activity. For the Tweed Rail Trail, the rail line had not been maintained since its last use in 2004 and its condition was largely unknown. The corridor should be inspected for slips and landslides of slopes and batters and if needed geotechnical investigations should be performed to assess stability, and recommend remediation measures.

## **6.2 Project Risk**

Project risks are contained in the Project Risk Register in Appendix C. This appendix provides an overview of potential risks for the project but is not an exhaustive list. It is expected to be updated at the start of the project as noted in the program and ongoing throughout project delivery.

## 7. Recommendations

The following sections summarise the key recommendation findings from the completed desktop analysis for the 35.5km section from Ben Lomond to Glen Innes. Please note that these are recommendations based on shared learnings from NSW PWs' experience with rail trails and is not a detailed peer review of Mike Halliburton's report.

### Lease:

1. GISC initiate lease negotiations with TfNSW for the full 35.5km length
2. Two lease agreements are entered with TfNSW. One is for early investigations within the corridor; the second is for the construction and operation of the trail.
3. GISC seek a record of all existing lease agreements from TfNSW
4. GISC and TfNSW determine who is responsible for maintaining all assets crossing the rail corridor.

### Trail Path:

5. Trail length is maintained at 35.5km, subject to budget availability;
6. Increase the path width to a nominal 3m width where possible;
7. Construction costs of the path to be increased to \$80 per lineal metre;
8. Removal of rail and sleeper costs are to be increased to \$9 per lineal metre;
9. During construction, the contractor is to keep aside a proposed quantity of good-condition sleepers/transoms and rail for GISC's future use.
10. Council to confirm that the entire NERT path surface is to be unsealed; and
11. Council to consider DDA compliance for the rail trail, and what elements are allowable on the trail.

### Bridges:

12. There is currently insufficient budget to rebuild all bridges on-formation;
13. Cost savings of approx. \$886,733 could be achieved by bypassing all 5 major timber bridges;
14. Minor on-formation bridge replacement forecast costs in the NERT final report are too low and are recommended to be increased;
15. Where possible, for the shortest on-formation crossings, a pre-cast culvert solution is recommended to reduce costs;
16. Minor funds are to be allocated to the Crotty Bridge overpass to make it safe before allowing trail users to travel under the structure;
17. The necessary reviews are conducted to confirm if any of the bridges are heritage-listed, and a Conservation Management Plan and a Statement of Heritage Impact is prepared for the rail trail, which will include recommendations to record the details of any bridges that will be fully or partially demolished;
18. Depending on the selected procurement strategy, some survey and minimal geotechnical investigations may be required before advertising a construction tender; and
19. It is recommended that a dedicated bridges specification is developed to ensure the final constructed results meet the quality, aesthetics, maintenance, and loading requirements.

### Trailheads, Amenities, Wayfinding, and Signage Summary:

20. Provide onsite shading at Glen Innes Trailhead through an additional shelter, concrete slab and picnic table;
21. Provide onsite shading at Glencoe Station through an additional shelter and concrete slab;
22. Keep sections of railway (rail and sleepers) on-formation at key locations such as Glencoe Trailhead and Glen Innes Station to allow for future heritage presentation;
23. Keep overall Trailhead scope to a minimum for this initial construction due to budget constraints;

24. Review the toilets and drinking water facilities available at key nodes to determine if further infrastructure is needed;
25. Conduct a DDA compliance audit on the proposed Trailhead designs, existing toilets and drinking facilities to determine if upgrades are part of the initial NERT scope or future planned works when later funding becomes available;
26. Develop an overarching wayfinding and signage specification that provides an overall identity for the full extent of the NERT once adopted (not just GISC-specific); and
27. Increase budget allocation to allow the development of signage specifications.

#### **Fencing and Corridor Leasing:**

28. Manage the fencing on a case-by-case basis. Focus on areas where livestock can enter the trail or where residents have raised a desire to have fencing;
29. Keep the current budget allocation of \$1,007,500 to erect fencing, including fencing repairs, removal of the old fence, clearing of regrowth on fence lines, and screening plants; and
30. Engage landowners early in the project to develop the fencing scope. The fencing scoping development takes time and rushing negotiations with the landowners will negatively impact the outcomes.

#### **Road Crossing Summary Recommendations:**

31. Chicanes are recommended for all road crossings;
32. GISC or an approved representative should discuss crossings solutions for the New England Highway with Transport for NSW and undertake a Road Safety Audit;
33. A traffic counter is installed on the New England Highway crossing as soon as possible to capture the quantum of vehicles passing and at what time, to help inform the crossing solution;
34. Have the centre lines changed from overtaking lanes to double lines to stop vehicles overtaking at the crossing location;
35. Investigate a possible centre refuge suitable for bikes and pedestrians (including prams). However, the budget does not accommodate for the construction of such a solution; and
36. The budget allocation for road crossing is to be increased by an additional \$34,780 to allow for chicanes and additional engineering consultation with Transport for NSW.

#### **Project Management:**

37. Recommend a consistent Project Manager to manage project from early-stage investigation, through to handover. It is recommended the same Project Manager are also involved in community consultation and landowner lease negotiations.
38. It is recommended the Project Management allocation made within the NERT scoping document is increased.

#### **Council Governance and Management:**

39. No budget allocation to council staff has been made to allow the charging of Council officers against the NERT project. An additional 5% of the total expenditure is recommended to be added to the budget unless GISC intend to co-contribute the associated costs.

#### **Planning, Design and Approvals:**

40. The NERT scoping document allocation of 2.5% to cover all approvals, permits, applications, designs, specifications, and assessments is lower than recommended. To be increased to 4% for design and an additional 1% for project approvals.

41. Prepare the necessary project documentation as early as possible to assist future phases of the Project, including, but not limited to: REF, Biosecurity Report, heritage reports, investigations reports, hydrology report, survey, and concept design

**Funding Deed:**

42. GISC to confirm with the funding body that Council what type of costs are eligible to be charged against the NERT project on the basis the cost has occurred directly because of the NERT project and before project final milestones as to defined in the deed.

**Project Program:**

43. Project completion is forecast for the End of October 2024. It is recommended to continue the progress of the deed execution and lease negotiations with TfNSW as quick as possible. Any delays will likely impact the set project completion date.
44. It is recommended to continue discussions with the BLER funding body and discuss options regarding a project completion beyond June 2023.
45. GISC could consider removing the rail and sleepers themselves prior to the Construction contractor site establishment to reduce total construction duration.

**Protect Estimation:**

46. From the desktop review findings, the project estimate is \$10,796,288. The following options are recommended:
  1. Seek an additional \$2,075,133 from the BLER funding body or an alternative funding source.
  2. Council reduce the project estimate by co-contributing costs incurred from council staff working on the NERT project.
47. A contingency of 25% was applied due to the high level of unknown details and assumptions made in the NERT scoping report. Such as unknown hydrology and heritage status for bridges and bypasses, on-formation bridge conditions, water crossing topography, and geotechnical data at bypasses.
48. A Quantity Surveyor (QS) be engaged to review the desktop analysis estimated cost.

In conclusion, if the project was to be delivered as per the NERT scoping document, additional funding beyond the \$8,721,096 is recommended, with the project completion forecast for October 2024.

# Appendix A High Level Program Summary

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Qtr 1, 2023			Qtr 2, 2023			Qtr 3, 2023			Qtr 4, 2023			Qtr 1, 2024			Qtr 2, 2024			Qtr 3, 2024			Qtr 4,						
							Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct						
1		<b>Stage 1: Project Deed &amp; Lease</b>	<b>194 days</b>	<b>Wed 4/01/23</b>	<b>Mon 2/10/23</b>																													
2		Execute Deed	63 days	Wed 4/01/23	Fri 31/03/23																													
3		Legislation to close railway	134 days	Tue 28/02/23	Fri 1/09/23																													
4		<b>Lease and Governance with TfNSW</b>	<b>131 days</b>	<b>Mon 3/04/23</b>	<b>Mon 2/10/23</b>																													
5		Negotiate short-term investigation stage lease	41 days	Mon 3/04/23	Mon 29/05/23	2																												
6		Negotiate Long-term construction & operation lease	131 days	Mon 3/04/23	Mon 2/10/23	2																												
7		<b>Stage 2: Project Approvals</b>	<b>170 days</b>	<b>Mon 3/04/23</b>	<b>Fri 24/11/23</b>																													
8		Bill for closing railway - Legislation is passed	10 days	Mon 4/09/23	Fri 15/09/23	3																												
9		LEP Amendment	170 days	Mon 3/04/23	Fri 24/11/23	2																												
10		<b>Stage 3: REF</b>	<b>175 days?</b>	<b>Mon 3/04/23</b>	<b>Fri 1/12/23</b>																													
11		REF Consultant Procurement	33 days	Mon 3/04/23	Wed 17/05/23	2																												
12		REF Preparation	80 days?	Thu 18/05/23	Wed 6/09/23	11																												
13		Section 60 Heritage Application	51 days	Thu 7/09/23	Thu 16/11/23	12																												
14		Review of Environmental Factors Determination	5 days	Mon 27/11/23	Fri 1/12/23	13,9,12																												
15		<b>Stage 4: Design</b>	<b>146 days</b>	<b>Mon 3/04/23</b>	<b>Mon 23/10/23</b>																													
16		Design Consultant Procurement	51 days	Mon 3/04/23	Mon 12/06/23	2																												
17		Develop Masterplan	25 days	Tue 13/06/23	Mon 17/07/23	16																												
18		Site Investigations	31 days	Tue 13/06/23	Tue 25/07/23	16,5																												
19		Concept Design	50 days	Tue 13/06/23	Mon 21/08/23	16																												
20		Detailed Design	45 days	Tue 22/08/23	Mon 23/10/23	19																												
21		<b>Stage 5: Community Consultation</b>	<b>228 days</b>	<b>Thu 29/06/23</b>	<b>Mon 13/05/24</b>																													
22		Community Engagement Consultant Procure	33 days	Thu 29/06/23	Mon 14/08/23																													
23		Develop Consultation Plan	15 days	Tue 15/08/23	Mon 4/09/23	17,22																												
24		Implement Plan (Landowners & Community engagement)	94 days	Tue 5/09/23	Fri 12/01/24	23																												
25		Landowner Lease negotiations for corridor use	126 days	Mon 20/11/23	Mon 13/05/24	24FS-40 days																												
26		<b>Stage 5: Construction</b>	<b>308 days</b>	<b>Tue 22/08/23</b>	<b>Thu 24/10/24</b>																													
27		Procure Construction	88 days	Tue 22/08/23	Thu 21/12/23	19,14FF,20FS-4																												
28		<b>Christmas Shutdown (2 Weeks)</b>	<b>20 days</b>	<b>Fri 22/12/23</b>	<b>Thu 18/01/24</b>	<b>27</b>																												
29		Site Establishment & Pre-work record	15 days	Fri 19/01/24	Thu 8/02/24	27,6,28																												
30		Removal of Railway Infrastructure	70 days	Fri 9/02/24	Thu 16/05/24	29																												
31		Bridge Procurement	50 days	Fri 9/02/24	Thu 18/04/24	29																												
32		Trail Civil Works inc Road Crossings (2 x crews after all rail & sleeper removed)	100 days	Fri 15/03/24	Thu 1/08/24	30FS-45 days																												
33		Trailhead's	20 days	Fri 2/08/24	Thu 29/08/24	32																												
34		Bridge Treatment Works	80 days	Fri 19/04/24	Thu 8/08/24	31																												
35		Fencing & Stock Crossings	100 days	Tue 5/03/24	Mon 22/07/24	25FS-50 days																												
36		Signage and general rectifications	20 days	Fri 30/08/24	Thu 26/09/24	33																												
37		Demobilisation from Site	10 days	Fri 27/09/24	Thu 10/10/24	36																												
38		Project Finalisation	20 days	Fri 27/09/24	Thu 24/10/24	36																												
39		Project Completion	0 days	Thu 24/10/24	Thu 24/10/24	38																												

Project: NERT High Level Progr  
Date: Thu 26/01/23

Task		Inactive Task		Manual Summary Rollup		External Milestone		Manual Progress	
Split		Inactive Milestone		Manual Summary		Deadline			
Milestone		Inactive Summary		Start-only		Critical			
Summary		Manual Task		Finish-only		Critical Split			
Project Summary		Duration-only		External Tasks		Progress			

## Appendix B      Project Cashflow



## Appendix C Risk Register

## New England Rail Trail - Ben Lomond to Glen Innes Project

RISK IDENTIFICATION						RISK PRIORITY				RISK TREATMENT			RESIDUAL RISK			RISK MONITORING	
ID	RISK CATEGORY	CAUSE Due to...	RISK There is a risk that...	EFFECT Which could result in...	DATE RAISED	RISK IMPACT	RISK PROBABILITY	RISK LEVEL	PRIORITY	PREVENTATIVE CONTROL MEASURES	OWNER	BY WHEN	RESIDUAL IMPACT	RESIDUAL PROBABILITY	RESIDUAL RISK LEVEL	RISK STATUS	COMMENTS
R-50	Cost	Project proceeds with insufficient funds as identified in NSW PW NERT - Ben Lomond to Glen Innes desktop analysis.	Funding received is not sufficient to complete project to a minimum satisfactory level	Failure or delay of project.		SEVERE	LIKELY	EXTREME	1	GISC seek additional funding or consider co-contribution, such as to cover council staff costs reduce expenditure against the BLER allocation. GISC seek to reduce costs through the use of their own assets such as quarry material supply.	Executive Sponsor	End March 2023	SEVERE	UNLIKELY	VERY LOW	OPEN	
R-51	Cost	Project is not completed in the set timeframe defined by the BLER (June 2024)	Milestone payments requested after June 2024 are not paid under the BLER fund	Failure or delay of project.		SEVERE	LIKELY	EXTREME	1	Inform the BLER funding body of risk and negotiate opportunities. Continue with TNSW ease and Bill requirements and avoid any potential delays.	Executive Sponsor	End Feb 2023	SEVERE	UNLIKELY	LOW	OPEN	
R-32	Environmental	Any requirement to perform soil sampling as part of a detailed site investigation for the project	Contamination (including asbestos) is identified.	Requirement for a RAP. Significant cost. Significant time delays.		MAJOR	LIKELY	EXTREME	3	Justify concept design as a supported remediation option. Minimise excavation works. Manage operational use in light of possible contamination.	Project Manager	Aug-23	MINOR	UNLIKELY	HIGH	OPEN	
R-24	Environmental	Possible contamination present in the ballast / rail corridor.	Extensive investigations will be required to determine the extent of contamination.	Significant cost for remediation. Delays to the Project opening. Perception of Public health issues, which impacts the reputation of the RT and Council.		MAJOR	POSSIBLE	MEDIUM	4	Perform detailed review of environmental factors.	Environmental Scientist	Sep-23	MODERATE	UNLIKELY	MEDIUM	OPEN	
R-28	Planning	The requirement to seek heritage approval from the State government (DPE)	Heritage approval is not granted.	Inability to construct works at heritage sites such as bridges or stations		MAJOR	POSSIBLE	HIGH	4	Engagement of heritage consultant and Council heritage advisor to advise project team regarding heritage requirements for the project. Heritage consultant to prepare high quality documentation for application on behalf of Council. Consultant/Council staff to liaise and consult NSW Heritage Division staff regarding the project and justify design / make changes to design. Prepare concept design documentation early to enable early finalisation and lodgement of heritage application documentation.	Project Manager	Sep-23	MODERATE	UNLIKELY	MEDIUM	OPEN	
R-30	Environmental	Endangered species of fauna discovered in construction footprint	Loss of biodiversity during construction or operation	Fines, poor reputation, visitor decline, rehabilitation costs		MAJOR	POSSIBLE	HIGH	4	Fully consider impacts to fauna as a result of the project (including habitat and animal presence within the project footprint). Develop a concept design that is sympathetic to these species and habitat during both construction and operation.	Environmental Scientist	Sep-23	MINOR	UNLIKELY	MEDIUM	OPEN	
R-33	Procurement	Market Conditions with the construction industry.	The procurement model is not palatable / of interest to the market.	Not Enough Prospective Tenderers show interest in the procurement tender phase, reducing the likelihood of getting competitive pricing		MAJOR	POSSIBLE	HIGH	4	Communicate to market. Development of a procurement plan including identification of likely contractor requirements and early notifications to relevant sector.	Project Manager	Aug-23	MAJOR	UNLIKELY	MEDIUM	OPEN	
R-45	Design	Insufficient consideration of where the rail trail access points are	The Construction Contractor will not be able to easily access key construction areas, users of the rail trail will not be able to easily access the trail, and it will be too difficult for emergency services to access certain sections of the rail trail. (Emergency Access)	Frustration from Users which will damage the reputation of the RT. Reputation impact for Council if emergency services cannot easily access the RT.		MAJOR	POSSIBLE	HIGH	4	Determine potential access points. Liaise with Emergency services as needed. Liaise with property owners to gain construction access where necessary.	Project Manager	Sep-23	MAJOR	UNLIKELY	MEDIUM	OPEN	
R-10	Opposition	Desire for trains. Lack of understanding of constraints	Rail groups campaign against rail trail project. General lobbying against project.	Negative impact on Councils reputation.		MINOR	ALMOST CERTAIN	MEDIUM	9	Develop and implement education and marketing campaign to ensure factual information is available. Clarify State intentions for consultation associated with legislation change. Possibly align consultation efforts.	Communication Officer	Jun-23	MINOR	LIKELY	LOW	OPEN	
R-27	Planning	Complexity of planning legislation	An LEP amendment that allows for environmental assessment under Part 5 is not facilitated	Inability to obtain planning approval		SEVERE	UNLIKELY	MEDIUM	9	Lodge high level planning proposal with DPE. Continue to liaise with DPE contacts. Continue to manage relationships with State politicians. Continue to liaise with and seek support of local politicians.	Project Director	End Dec 23	SEVERE	UNLIKELY	MEDIUM	OPEN	
R-49	Communication	Lack of promotion; business case too optimistic	Rail trail doesn't meet the success expected	Council reputation; Grant funding; maintenance cost; damage of RT brand in Australia		SEVERE	UNLIKELY	MEDIUM	9	Promote; consult community and businesses; consider including community interactive areas such as bbq, picnic areas; play ground; fitness gear	Project Director	Ongoing	SEVERE	RARE	LOW	OPEN	
R-9	Opposition	Perceived negative affects (i.e. crime, trespassing, loss of privacy, etc.)	Neighbouring landowners object to project	Negative impact on Councils reputation.		MINOR	ALMOST CERTAIN	MEDIUM	9	Proactive consultation. Highlight the experiences from other successful rail trails. Clarify State intentions for consultation associated with legislation change. Possibly align consultation efforts.	Communication Officer	Jun-23	MINOR	LIKELY	MEDIUM	OPEN	
R-11	Communication	Lack of project resources. Lack of monitoring media. Lack of proactive consultation	The project will receive significant adverse media attention.	Negative impact on Councils reputation.		MODERATE	POSSIBLE	MEDIUM	13	Proactive consultation. Project media officer monitors media	Communication Officer	As Required	MODERATE	UNLIKELY	MEDIUM	OPEN	
R-14	Human Resources	Staff turnover. Staff workload. Resourcing	Insufficient resources to professionally manage project	Poor management of project. Delay and additional costs		MODERATE	POSSIBLE	MEDIUM	13	Allocate adequate resources to project	Project Director	Ongoing	MODERATE	UNLIKELY	MEDIUM	OPEN	
R-18	Communication	Insufficient consultation or misleading consultation feedback.	Objectors become very vocal about their issues with the project.	Negative media reports, reduced community support, and negative impact on Councils reputation.		MODERATE	POSSIBLE	MEDIUM	13	Proactive consultation. Record consultation activities	Project Manager	Jun-23	MINOR	UNLIKELY	MEDIUM	OPEN	
R-31	Environmental	Requirement to construct new waterway crossings	Pollution of waterways, loss of fish and riparian habitat	Fines, poor reputation		MODERATE	POSSIBLE	MEDIUM	13	Design to replace decks on existing supports where possible or include single span bridges on abutments placed away from the banks of streams wherever possible. Engagement of competent construction contractor with demonstrated environmental performance. Requirement for construction contractor to develop	Project Manager	End Dec 23	MINOR	UNLIKELY	MEDIUM	OPEN	
R-36	Procurement	Contractor from a different state	Contractor is not familiar with GC21 Contract, Environmental Requirements, or other requirements.	Contractual conflicts.		MODERATE	POSSIBLE	MEDIUM	13	Clearly defined Contract Requirements. Upfront communication. Ensure selection process identifies a Contractor who is familiar with the contractual requirements for a Project of this size.	Project Manager	End Dec 23	MODERATE	UNLIKELY	LOW	OPEN	
R-37	Procurement	Lack of sufficient Investigations - e.g. Geotechnical, Survey, Environmental, and Bridge treatments	Design changes	Delays and increased costs		MODERATE	POSSIBLE	HIGH	13	GISC or awarded design consultant to conduct sufficient investigations during concept design	Project Manager	Oct-23	MODERATE	UNLIKELY	MEDIUM	OPEN	
R-38	Design	Private Owner Opposition	Where construction requires access through private property difficulties with construction methodology.	Loss of access for the Rail Trail. Delays to the Project.		MODERATE	POSSIBLE	VERY HIGH	13	Commence community consultation. Negotiate a suitable outcome with affected landowner(s). Acquire the land if necessary.	Project Manager	Early Jan 24	MINOR	POSSIBLE	LOW	OPEN	
R-5	Planning	Underlying heritage/ecological/health issues uncovered	Unforeseen environmental/planning constraints make project infeasible	Delay and additional cost to project		MODERATE	POSSIBLE	MEDIUM	13	Perform detailed review of environmental factors. Progress planning approvals.	Environmental Scientist	Sep-23	MODERATE	UNLIKELY	MEDIUM	OPEN	
R-8	Political	Neighbouring Council differing position precludes continuation of rail trail	Other Council's competing wants with respect to rail corridor reduces viability of ultimate rail trail	No extension of the rail trail as part of the NERT. Reduced visibility of the Ben Lomond to Glen Innes Stage of the rail trail		MODERATE	POSSIBLE	MEDIUM	13	Inform State representatives of the importance of future extensions of rail trail. Engage with DPC/Ministers/local members to have whole corridor approved for Rail Trail.	Executive Sponsor	Ongoing	MODERATE	UNLIKELY	MEDIUM	OPEN	
R-29	Planning	Failure to consult with NSW Fisheries early in the project.	The fisheries permits are not granted for the various creek crossings.	Either significant delays in negotiating with NSW Fisheries, or the inability to deliver the project.		MAJOR	UNLIKELY	MEDIUM	22	Continue to liaise with and consult NSW Fisheries staff regarding the project including proposed site visit. Prepare concept design in support of application documentation early and submit documentation in support of application early to prevent risk of not obtaining approval.	Environmental Scientist	Sep-23	MODERATE	RARE	MEDIUM	OPEN	
R-35	Procurement	The RFT documentation being too ambiguous with regard to skills and experience required from the Constructor.	The successful Contractor does not have the appropriate skills and experience to deliver a high quality design and a high quality rail trail product.	The construction of a rail trail that fails to impress the local community or visitors, confirmed by low visitor numbers.		MAJOR	UNLIKELY	HIGH	22	Clear requirements and constraints in the RFT documentation.	Project Manager	Dec-23	MAJOR	RARE	LOW	OPEN	
R-41	Design	Old timber bridges bypassed in poor conditions	Bypassed old timber bridges become significant safety issue for the public	Damage to property / Serious injury to public and/or significant costs to keep bridges safe.		MAJOR	UNLIKELY	MEDIUM	22	Decide whether any timber bridges will be left in place and bypassed. Conduct an inspection pre-project completion to identify any immediate repairs required to reduce risk. Install appropriate signage and consider fencing. Continue negotiations with TNSW and Crown Lands. GISC to get advice from insurers / legal.	Project Manager	End Aug 2023	MAJOR	RARE	MEDIUM	OPEN	
R-43	Environmental	High risk of flooding	RT is blamed for upstream flooding issues, and RT infrastructure being washed away	Significant added costs, Council's reputation.		MAJOR	UNLIKELY	MEDIUM	22	Minimise any additional new barriers placed below the current bridge deck heights that would impeded the flow of floodwaters. If any low-level bypass crossings, set them as low as possible, and design to overtop, with resistance to uplift forces from flood flows. Hydrology study to be undertaken. Opportunity to use any existing flood models for GISC.	Project Manager	Jun-23	MAJOR	UNLIKELY	MEDIUM	OPEN	
R-6	Governance	A reluctance by State Government to pass legislation to approve Rail Trail.	The legislation will not be passed within the timeframe required for the Project.	Delay in the ability of the successful Contractor to commence works.		MAJOR	UNLIKELY	HIGH	22	Commence early process to have legislation submission prepared and brought before parliament.	Executive Sponsor	Sep-23	MAJOR	RARE	HIGH	OPEN	
R-17	Environmental	Bushfires.	The RT will be closed and infrastructure will be damaged.	Recovery costs. Closure of trail - loss of income.		MINOR	POSSIBLE	MEDIUM	27	Specify in design brief/scope the requirement for Design Resilience, where possible.	Project Manager	Apr-23	MINOR	POSSIBLE	LOW	OPEN	

**New England Rail Trail - Ben Lomond to Glen Innes Project**

RISK IDENTIFICATION										RISK PRIORITY			RISK TREATMENT			RESIDUAL RISK			RISK MONITORING	
ID	RISK CATEGORY	CAUSE Due to...	RISK There is a risk that...	EFFECT Which could result in...	DATE RAISED	RISK IMPACT	RISK PROBABILITY	RISK LEVEL	PRIORITY	PREVENTATIVE CONTROL MEASURES	OWNER	BY WHEN	RESIDUAL IMPACT	RESIDUAL PROBABILITY	RESIDUAL RISK LEVEL	RISK STATUS	COMMENTS			
R-19	Planning	The submission of private operator proposals	Conflicting use of rail corridor proposal emerges (i.e. rail carts)	Spread of misinformation. Negative impact on Council's reputation		MODERATE	UNLIKELY	MEDIUM	27	Make clear and publicise Council's position on the rail trail. Provide information on why rail trail is best option for community.	Project Director	Ongoing	MINOR	UNLIKELY	LOW	OPEN				
R-2	Cost	Initial conceptual estimate (and funding applied for) made with low level of information/knowledge of rail corridor. Detailed investigation may reveal that it does not cover the real cost of project.	Funding received is not sufficient to complete project to a minimum satisfactory level	Major delay to project whilst additional funding is sought.		MODERATE	UNLIKELY		27	Complete detailed investigation, survey and design. Engage specialist advice where required. Update project estimate regularly. Adjust scope to stay within budget.	Project Manager	Apr-23	MODERATE	RARE		OPEN				
R-23	Cost	Transport for NSW requires recovery and storage of rails but will not contribute to this cost.	Cost of track removal/disposal is borne by project (no recovery of value)	Increased costs		MINOR	POSSIBLE	MEDIUM	27	Seek advice of Country Rail Contracts (Transport for NSW)	Project Manager	End Dec 2023	MINOR	UNLIKELY	LOW	OPEN				
R-48	Design	Insufficient Design consideration of future maintenance during the detailed design phase.	Maintenance is higher than expected due to failing pavements, higher traffic volumes, etc.	Increase maintenance budget; lack of maintenance; rail trail deterioration		MODERATE	UNLIKELY	HIGH	27	Review design and options; lessons learnt from similar projects; pavement testing; control and monitor access to rail trail	Project Manager	Jun-23	MINOR	UNLIKELY	MEDIUM	OPEN				
R-7	Governance	The volume of stakeholders/interested parties wanting to contribute to the governance body	There will be too many parties to create a viable functioning governance body.	Failure to effectively manage rail trail. Poor service delivery. Additional costs.		MINOR	POSSIBLE	MEDIUM	27	Review governance models for Tumbumba and other similar enterprises	Executive Sponsor	Apr-23	MINOR	UNLIKELY	LOW	OPEN				
R-1	Cost	Reluctance of Federal Govt to commit to the full funding of the RT Project due to uncertainty regarding Railway closure and land ownership.	Project funding (capital cost) not forthcoming	Failure or delay of project.		SEVERE	RARE	EXTREME	33	Maintain/increase positive liaison with local members/Ministers. Continue communication with the Federal Govt.	Executive Sponsor	Mar-23	SEVERE	RARE	HIGH	OPEN				
R-20	Planning	Lack of passive surveillance	Personal/user safety. Criminal incidents on trail	Perception that trail is dangerous. Reduced user volumes. Physical/psychological damage to victim		MINOR	UNLIKELY	LOW	34	Design for safety/surveillance. Incorporate any lessons learned from other RT's in Australia or overseas.	Project Manager	Ongoing	MINOR	RARE	VERY LOW	OPEN				
R-21	Environmental	Lack of information being passed onto farmers adjoining the RT.	Key issues such as Biosecurity, are not communicated with these Stakeholders.	Negative feedback from farmers. Negative impact on Councils and the RT's reputation.		MINOR	UNLIKELY	MEDIUM	34	Commission the investigations into Biosecurity and communicate the results to local Farmers and adjoining landowners. Incorporate any lessons learned from the Tweed rail trail section.	Project Director	Ongoing	INSIGNIFICANT	UNLIKELY	MEDIUM	OPEN				