

### 11.1.2 LORINNA ACCESS

Report Author: General Manager Gerald Monson  
Manager Engineering Services Jonathan Magor

File reference: Roads/Liaison

#### 1. PURPOSE OF REPORT:

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To consider options to provide improved access into Lorinna.

#### 2. BACKGROUND:

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Over the last 25 years there has been considerable debate and consultation with the community on the provision of a safe road access to Lorinna.

Council had previously met with Hon. Rene Hidding MP to ascertain the likelihood of the State Government considering the future upgrade of Lorinna Road as a project under the Community Roads Program.

A letter from the Minister dated 4 November 2015 advised Council that *“While the State Government is sympathetic to this particular matter, given its long history and my own interest in it, the responsibility for funding improvements to this road must lie with the Council.*

At the Council Meeting held on November 15<sup>th</sup> 2015, it was agreed *‘that Council receive the letter from the Minister for Infrastructure the Hon M.T. (Rene) Hidding MP dated 4 November 2015 and not fund the proposed reopening of Lorinna Road and seek a further meeting with the Lorinna community to discuss options to provide improved access into Lorinna’.*

A community meeting held 3 March 3<sup>rd</sup> 2016 was well attended and at the conclusion the Mayor invited the Lorinna residents to make a submission to Council detailing their opinion on the issues discussed.

Submissions closed Friday 31 March 2016 with a broad range of opinions received. There was considerable support for the following options:

- reopen Lorinna Road
- upgrade River Road
- Wilks Road extension through reserve road area
- One way via Lorinna Road and River Road

At the 5 April 2016 Council Forum the General Manager suggested Council convene a stakeholders group comprising local residents who had expressed an opinion which broadly represents the different viewpoints detailed in the majority of submissions received. The Stakeholders Group was to act as a conduit between the Council and the community to discuss issues as they arise on the following options to be considered by Council:

- upgrade River Road
- Wilks Road extension through Reserve Road area
- One way via Lorinna Road and River Road

(Council had previously made a decision that it will not consider the reopening of Lorinna Road).

The inaugural stakeholders meeting was held on 11 May 2016 where it was agreed there was a general lack of understanding within the group regarding the Wilks Road extension. This was remedied when the Stakeholders Group took a walk along the Wilks Road extension on Friday 27 May 2016. It was intended after the walk that the Manager Engineering Services Jonathan Magor and the Works Manager David Sondergeld would undertake a further desk top review and assessment in relation to road constructability. They had also planned to review and assess River Road for potential upgrades on the 7 June 2016, however both intentions were cancelled following the severe weather event on 5 and 6 June 2016 which caused significant damage to infrastructure across the municipality.

The damage sustained on Olivers Tourist Road, Lemonthyme and River Roads was extensive and Lorinna became isolated. Confirmation was established on the 9 June 2016 that neither River Road or Lorinna Road could provide a short term access for Lorinna. Having recently walked the Wilks Road extension with the Stakeholder Group the General Manager made the decision to put an emergency 4WD track through private and Forestry Tasmania land to link Wilks Road and Olivers Tourist Road.

Council also engaged consultants to progress the reopening of River Road as it was identified as the only option to provide reasonably short-term access for 2WD vehicles to enter or exit the Lorinna community.

The repair of River Road was funded under the Natural Disaster Relief and Recovery Arrangements (NDRRA) with Council recouping approximately 75% of the cost of the repair from the State and Federal Government program (River Road reopened and the Wilks Road 4WD emergency route closed concurrently on Friday 9 December 2016).

A further meeting of the community was held on 13 July 2016 to discuss the impacts of the flood event and emergency and long term access to Lorinna. The attendees were advised that Council would continue to work on the options already identified following the March 2016 public meeting.

It also became apparent the role of the Stakeholders Group had been overtaken by the June flood event and at the 6 September 2016 Council Forum it was decided to disband the Group and Council's Municipal Engineer and Council's Works Manager continued to undertake surveys and work on costings for the various previously agreed scenarios.

The Manager Engineering Services has now finalised a report titled '*Lorinna Access Options*' (copy attached) which outlines the observations made and issues identified during the process of investigating and cost estimating the various alternatives. It considers fourteen iterations using River Road or Wilks Road in addition to potentially using Lorinna Road in one direction. Consideration was also given to access by heavy vehicles and in times of emergency.

The three road standards are considered are:

- 1) To comply with <30 Vehicles Per Day (VPD) with 4m traffic plus 0.5m shoulders. Per the 2013 Pitt and Sherry Lorinna Road report. This is equivalent to the US1 road standard from the Tasmanian Local Government Municipal Standard Drawings. Marginal at current traffic volumes and provides no potential

for future growth. This may include some 'pinch points', effectively creating what will be referred to as a Sub-US1 standard.

- 2) To comply with 30-100 VPD with 4m traffic plus 1m shoulders. To build for the future needs and should be a target for any 'new' roads. This is equivalent to the US2 road standard from the Tasmanian Local Government Municipal Standards Drawings.
- 3) For emergency use or one way traffic then a minimum 3.5m wide pavement has been used.

Each option presented is describes as follows:

**Option A**

One-way in Wilks Rd, out River Rd. River Rd generally one way for exiting but two-way for heavy vehicles. Wilks Rd or River Rd for emergency.

**Option B**

Wilks Rd (two-way with 0.5m shoulders / 4m traffic). River Rd for heavy vehicles. River Rd emergency.

**Option C**

Wilks Rd (two-way with 1m shoulders / 4m traffic). River Rd for heavy vehicles. River Rd emergency.

**Option D**

River Rd (two-way with 0.5m shoulders, / 4m traffic but with 'pinch points'), River Rd for heavy vehicles. Wilks Rd emergency.

**Option E**

One-way in River Rd, out Lorinna Rd. River Rd generally one way for entry but two-way for heavy vehicles. Wilks Rd, Lorinna Rd or River Rd for emergency.

**Option F**

Wilks Rd (two-way with 0.5m shoulders / 4m traffic). River Rd for heavy vehicles. Lorinna Rd and River Rd emergency.

**Option G**

Wilks Rd (two-way with 1m shoulders / 4m traffic). River Rd for heavy vehicles. Lorinna Rd and River Rd emergency.

**Option H**

River Rd (two-way with 0.5m shoulders / 4m traffic), River Rd for heavy vehicles. Wilks Rd emergency.

**Option I**

One-way in Wilks Rd, out Lorinna Rd. River Rd for heavy vehicles. Wilks Rd, Lorinna Rd or River Rd for emergency.

**Option J**

Lorinna Rd (two-way with 0.5m shoulders / 4m traffic but with 'pinch points'). River Rd for heavy vehicles. Wilks Rd or River Rd emergency.

**Option K**

River Rd (two-way with 1m shoulders / 4m traffic). River Rd for heavy vehicles. Wilks Rd emergency.

**Option L**

River Rd (two-way with 0.5m shoulders / 4m traffic but with 'pinch points'), River Rd for heavy vehicles. Wilks Rd & Lorinna Rd emergency.

**Option M**

River Rd (two-way with 0.5m shoulders / 4m traffic), River Rd for heavy vehicles. Lorinna Rd and Wilks Rd emergency.

**Option N**

River Rd (two-way with 1m shoulders / 4m traffic). River Rd for heavy vehicles. Lorinna Rd and Wilks Rd emergency.

The report's final section includes the following summary of costings and reference to previous reports and on-site assessments by Council's Manager Engineering and Works Manager following the June 2016 flooding.

Option	Capital cost (inc. non specialised survey, design, engineering and supervision etc.)	Annualised maintenance and once-off item costs	20 year total cost (ie all capital plus 20 years of maintenance in current \$)	Annualised 20 year total (capital plus maintenance costs)
A	\$649,121	\$52,945	\$1,708,017	\$85,401
B	\$803,880	\$48,945	\$1,782,776	\$89,139
C	\$957,462	\$50,945	\$1,976,358	\$98,818
D	\$1,805,011	\$45,245	\$2,709,907	\$135,495
E	\$875,958	\$100,501	\$2,885,984	\$144,299
F	\$1,408,743	\$89,951	\$3,207,769	\$160,388
G	\$1,562,325	\$91,951	\$3,401,351	\$170,068
H	\$2,421,345	\$53,066	\$3,482,670	\$174,133
I	\$1,518,479	\$101,201	\$3,542,505	\$177,125
J* <sup>1</sup>	\$2,002,946	\$93,501	\$3,872,972	\$193,649
K	\$3,059,840	\$58,281	\$4,225,451	\$211,273
L	\$2,409,873	\$99,287	\$4,395,614	\$219,781
M	\$3,026,208	\$94,073	\$4,907,662	\$245,383
N	\$3,664,703	\$99,287	\$5,650,443	\$282,522

\*<sup>1</sup> This option includes \$1,503,860 (excluding contingency) as estimated by Pitt and Sherry in 2013 and \$311,000 additional works following the June 2016 flooding. The Pitt and Sherry report was considered to err on the side of caution with respect to the need to revisit previous 'temporary' repairs and the cost of works at, for example, the major washout at Chainage 3300 where a \$79,000 allowance had been made. The total cost of works including a 10% contingency was believed to approach \$2,500,000 and Council made a decision to not upgrade Lorinna Road to that standard, however it is included above assessment for comparative purposes. Using \$2,500,000 will push this option further down the above table.

Lorinna residents were invited to a public meeting 1 December 2016 where Mr Magor presented an overview of his report including observations made, costings and issues identified during the process of investigating the short listed access options.

From this community meeting it became apparent the two options remaining for ongoing consideration are River Road and the Wilks Road extension.

At the conclusion of the community meeting Mayor Thwaites invited residents to submit their ideas on any issues that they did not believe had been discussed at the meeting. At the time of preparing this agenda item 21 submissions were received with the majority recapping on their ideas and suggestions discussed at the meeting. A summary of the submissions is included as an attachment.

There are many different users of road access to Lorinna including families, farmers, commuters, miners and sightseers, with some requiring heavy and long vehicle access.

Council has been urged to make a decision one way or the other on upgrading Lorinna access with a road that is both safe and cost effectively maintained.

### **3. RELATIONSHIP TO STRATEGIC/OPERATIONAL PLAN:**

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The Road Infrastructure Objective in the 2014-2024 Strategic Plan states:  
'To provide an appropriate, safe and well-maintained road network that caters for all road users throughout the municipality'.

### **4. STATUTORY REQUIREMENTS:**

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"Several guidelines have been prepared to assist councils to provide appropriate rural road access to communities.

These include

- i. Austroads publication AP-G1/03 Rural Road Design - A Guide to the Geometric Design of Rural Roads.
- ii. Tasmania's Department of Infrastructure Energy and Resources (DIER) - Road Hazard Management Guide.

### **5. FINANCIAL AND RESOURCES IMPACT:**

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The financial implications of the various options regarding the future access to Lorinna have been investigated however full detailed costings are not available at this time.

### **6. RISK MANAGEMENT IMPACT:**

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The Council Engineer previously closed Lorinna Road due to concern with road safety issues. Council has received legal advice that the Road needs to be upgraded to a fit for purpose status prior to any consideration being given to it being reopened. The report prepared by Consulting Engineers Pitt & Sherry was on this basis.

The future options to provide an improved access to Lorinna should also be on the basis of providing a fit-for-purpose road.

Several residents have submitted that River Road is unsafe due to the potential for rocks and trees falling on people from steep the mountainside above the roadway. They've highlighted the potential for vehicles going over the edge with a steep drop below. It is suggested that prior to any major work commencing on River Road a rock fall, tree fall and road collapse risk assessment be undertaken. A similar assessment was undertaken by Pitt and Sherry in their December 2013 report on Lorinna Road. The risk assessment for Lorinna Road was classified as acceptable under the health and safety directive (1989 a). The report commented that there are many published risk assessments that use various levels of acceptable risk, however, in general the limit to what is considered an acceptable risk is in the order of  $10^{-06}$  (1 in a million).

Council has previously closed Lorinna Road and concern has been expressed by some community members that the road continues to be used by small unregistered vehicles which poses a potential risk to the operators and Council. Council has received conflicting legal advice on whether the closed section of Lorinna Road is under Council's control or has already been formally closed. It is suggested that Council seek further advice on actions necessary to formally relieve Council of any legal responsibility for activity on the closed section of Lorinna Road.

#### **7. CONSULTATION:**

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There has been considerable debate and consultation with the community on the provision of a safe road access to Lorinna over the last 25 years. The wider Kentish community would wish the road access to Lorinna problem to be solved with minimum fuss and minimal funds expended.

#### **8. OFFICER COMMENTS/CONCLUSIONS:**

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there has been considerable debate and consultation with the community over many years on the provision of a safe road access into Lorinna. Numerous reports have been prepared over this time costing many thousands of dollars. Recent community meetings held at Lorinna on the 3 March 2016, 13 July 2016 and 1 December 2016 have been well attended. The following observations are drawn from these meetings:

1. Safety is the most important factor when Council decide which option they're going to support to provide a long term access to Lorinna.
2. More than one access road should be a requirement to ensure safe access for residents and emergency services.
3. There is very limited support for a one way route system into and out of Lorinna.
4. The capital and maintenance cost over the longer term should be taken into account when Council makes a decision.
5. A decision must be made as the current uncertainties have created angst and division within the community.
6. There is strong opposition to Council compulsory acquiring private land upon which to construct a new road.

It appears given the above circumstances that the two options remaining for consideration are either the upgrading of River Road or supporting a Wilks Road extension through the reserve road corridor and Forestry land to Olivers Tourist Road.

The Council has previously made a decision that it will not consider the reopening of Lorinna Road as a two way access due to the cost involved.

**OFFICER RECOMMENDATION:**

That

1. Council support Wilks Road extension through the Reserve Road corridor as the preferred long term Lorinna access Option C – to a standard US2 (4 metre wide traffic with 1 metre wide shoulders – estimated initial capital cost \$957,462); and
  - (i) the Director of Mineral Resources Tasmania be requested to use their Geohazard expertise to assess and analyse the risk of landslides and rock falls on the proposed route.
  - (ii) further investigations be undertaken on the steepness of the Reserve Road corridor and the impact on the terrain by building a road to meet the appropriate gradients for the steeper part of the route.
  - (iii) a report be prepared on the further studies and likely costs required for Council to submit a Planning Application for the proposed route.
  - (iv) Council seek formal approval from Forestry Tasmania to use the access through their land on a permanent basis.

Or

2. Council support River Road upgrade as the preferred long term Lorinna access Option D – to a standard US1 (4 metre wide traffic with 500 mm shoulders – with pinch points – estimated initial capital cost \$1,805,011); and
  - (i) a rock fall, tree fall and road collapse risk assessment be undertaken prior to any work commencing.
  - (ii) a report be prepared on any further studies and likely cost required if a Planning Application is required for the proposed upgrade.
  - (iii) Council seek formal approval from Forestry Tasmania to use the access through their land on a permanent basis.
3. Council's General Manager seek formal agreement from Bruce and Julie Page on:
  - (i) community access to the emergency route through their property while significant works are being undertaken to upgrade River Road.
  - (ii) usage of the route through their property during times of an emergency should the Wilks Road extension not be constructed in the future, or until such time as an alternative emergency route to River Road is constructed.
  - (iii) Council seek formal approval from Forestry Tasmania to use the access through their land on a permanent basis.
4. Council seek further advice on actions necessary to formally relieve Council of any legal responsibility for activity on the closed section of Lorinna Road.
5. Council's Manager of Engineering Services be requested to provide a report detailing River Road staged upgrade works and costings that would improve safety and usage of the Road by heavy vehicles (work that is considered beneficial whatever long term access option is decided upon).

**ATTACHMENT L– Discussion Report 4**  
**11.1.2 – Lorinna Access Report – Manager Engineering Services**

## **Lorinna Access Options**

**Observations made and issues identified during the process of investigating and cost estimating the short listed access options**



'Back to the Land' painted in 1993 by John Lendis\*

**Kentish Council**  
**Manager Engineering**  
**November 2016**

\*Situated on the shores of Lake Cethana with Mt Roland and the highlands leading to Cradle Mountain, Lorinna is today as early settlement was. Peaceful and rural, the Lorinna Valley has in recent years seen an influx of 'New Pioneers' who have settled the area without today's modern amenities.



## **Section 2 - Relevant Design Data**

### **2.1 Road Widths**

Three road standards are considered based on the TSD-RO1-v1 Standard Drawing on the following page:

- 1) To comply with <30 Vehicles Per Day (VPD) with 4m traffic plus 0.5m shoulders. Per the 2013 Pitt and Sherry Lorinna Road report. This is equivalent to the US1 road standard from the Tasmanian Local Government Municipal Standard Drawings. Marginal at current traffic volumes and provides no potential for future growth. This may include some 'pinch points', effectively creating what will be referred to as a Sub-US1 standard.
- 2) To comply with 30-100 VPD with 4m traffic plus 1m shoulders. To build for the future needs and should be a target for any 'new' roads. This is equivalent to the US2 road standard from the Tasmanian Local Government Municipal Standards Drawings.
- 3) For emergency use or one way traffic then a minimum 3.5m wide pavement has been used.

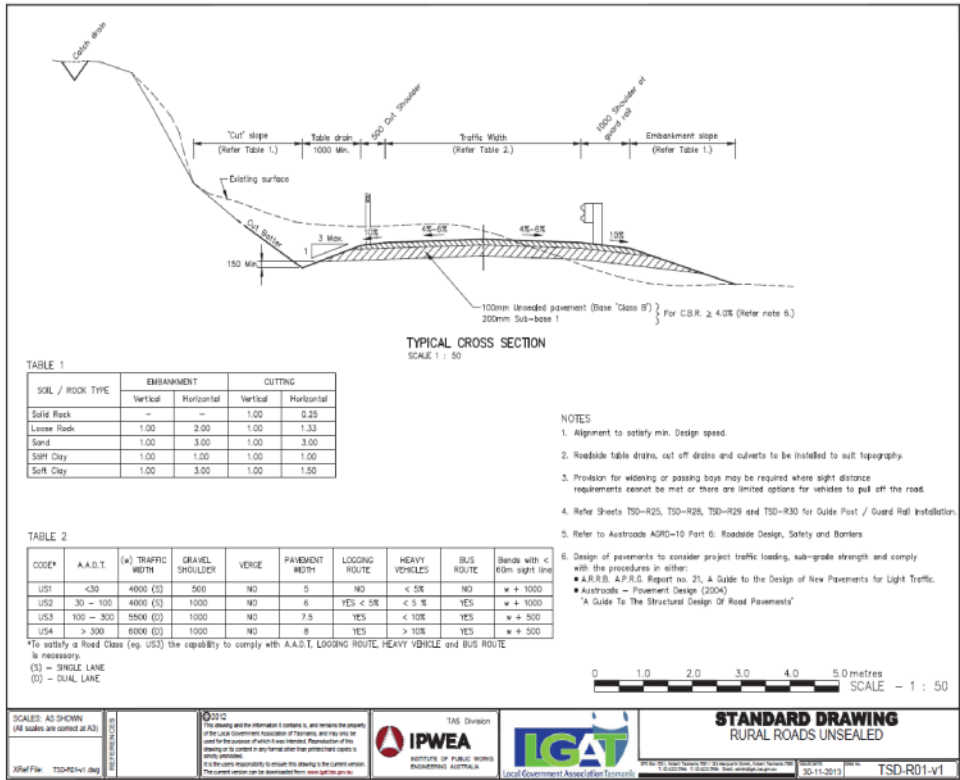


TABLE 1

SOIL / ROCK TYPE	EMBANKMENT		CUTTING	
	Vertical	Horizontal	Vertical	Horizontal
Solid Rock	-	-	1.00	0.25
Loose Rock	1.00	2.00	1.00	1.33
Sand	1.00	3.00	1.00	3.00
Silt Clay	1.00	1.00	1.00	1.00
Soft Clay	1.00	3.00	1.00	1.50

TABLE 2

CODE*	A.A.D.T.	(A) TRAFFIC WIDTH	GRAVEL SHOULDER	VERGE	PAVEMENT WIDTH	LOGGING ROUTE	HEAVY VEHICLES	BUS ROUTE	Bends with < 60m sight line
US1	<30	4000 (S)	500	NO	5	NO	< 5%	NO	w + 1000
US2	30 - 100	4000 (S)	1000	NO	6	YES < 5%	< 5 %	YES	w + 1000
US3	100 - 300	5500 (D)	1000	NO	7.5	YES	< 10%	YES	w + 500
US4	> 300	6000 (D)	1000	NO	8	YES	> 10%	YES	w + 500

\*To satisfy a Road Class (eg US3) the capability to comply with A.A.S.T, LOGGING ROUTE, HEAVY VEHICLE and BUS ROUTE is necessary  
(S) - SINGLE LANE  
(D) - DUAL LANE

NOTES

- Alignment to satisfy min. Design speed.
- Roadside table drains, cut off drains and culverts to be installed to suit topography.
- Provision for widening or passing bays may be required where sight distance requirements cannot be met or there are limited options for vehicles to pull off the road.
- Refer Sheets TSD-R25, TSD-R26, TSD-R29 and TSD-R30 for Guide Post / Guard Rail installation.
- Refer to Austroads AGRD-10 Part 6: Roadside Design, Safety and Barriers
- Design of pavements to consider project traffic loading, sub-grade strength and comply with the procedures in either:  
 • A.R.R.B. A.P.R.S. Report no. 21, A Guide to the Design of New Pavements for Light Traffic.  
 • Austroads - Pavement Design (2004)  
 • A Guide To The Structural Design Of Road Pavements\*



SCALES: AS SHOWN (All scales are correct at A3)

IPWEA INSTITUTE OF PUBLIC WORKS PROFESSIONALS AUSTRALIA

IGAT Local Government Association of Tasmania

**STANDARD DRAWING**  
RURAL ROADS UNSEALED

TSD-R01-v1

## 2.2 Sealed or Unsealed

For Kentish Council the average sealed road is twice as expensive to maintain over the longer term than the average unsealed road. A gravel road will only be more costly to maintain than a sealed road if traffic volumes or environmental factors result in a gravel road needing to be maintained significantly more than the 'average' gravel road.

The Australian Road Research Board's Unsealed Roads Manual – Guidelines to good Practice 2009 observes in section 7.7 that 'As a rough guide, it may be difficult to economically justify sealing a road carrying less than 100 vehicles per day (VPD), whereas if it is carrying over 250 VPD it will probably be justified. In between these values is the 'grey area'.....When social benefits are taken into account, such as reducing dust emissions, these threshold traffic levels could be much lower'.

Based on the above and the expected traffic volumes the main access for Lorinna would be an unsealed road. An exception to this that may warrant sealing would be to aid traction on particularly steep sections of road.

## 2.3 Steepness

Can be considered as a percentage (ie amount of rise divided by the distance that the rise takes place) or degrees (ie 360 degrees in a circle). For the purpose of this report % will be used as they are significantly easier to determine from maps without conversion tables and the majority of literature uses %. Note that it is not a direct linear conversion from one to the other as indicated below.

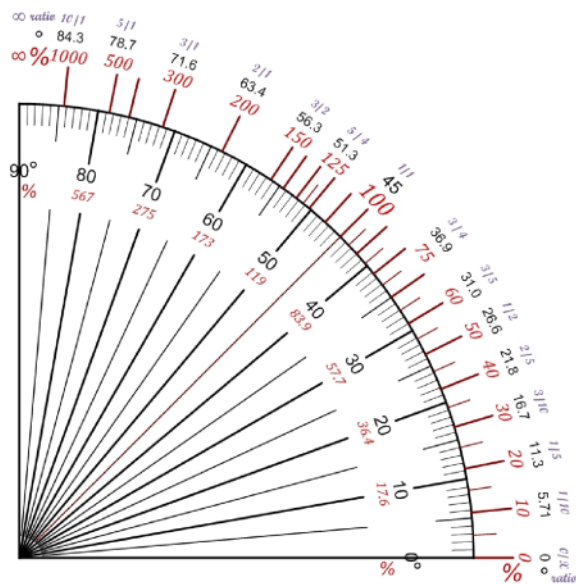


Figure: Degrees vs Percentage

With regards to steepness Section 4.2.4 of the Australian Road Research Board (ARRB) Unsealed Roads Manual states that:

*'The grade limit chosen will depend on the types of vehicles using the road, the terrain and road costs.....the maximum grade that a heavy vehicle can negotiate on a sealed road is 15%. However, this figure is dependent on the power to weight ratio of the vehicle and is therefore not fixed for all vehicles (Austroads 2003). Evidence exists that, due to insufficient traction, travel on earth or gravel roads is difficult for grades greater than 8% (Nyasulu 1989).'*

Also that *'Typical grades for forest roads in New Zealand can be as high as 12% on arterial type roads and up to 18% on minor offshoots. It should also be noted that steeper grades >6% will cause water run-off to flow mainly down the road pavement and could cause longitudinal scouring of the surface.'*

Table 4.2 of the manual identifies a maximum vertical grade of 12% in mountainous terrain. This is the steepest grade identified in the table. A footnote also states *'In some cases higher grades of up to 20% can be allowed for short sections (about 150m). Keep grades on unsealed roads lower due to ravelling and scouring of the surface.'*

On the basis that it will be difficult to gain traction, will cause longitudinal drainage issues and that there will be excessive wear and tear then an unsealed road should generally be limited to 12% grade with a maximum of 20% over a short length. Consideration should then be given to sealing the road to address some of these deficiencies.

With regards to sealed roads, the Rural Road Design – A Guide to the Geometric Design of Rural Roads produced by Austroads identifies in Table 10.1 that a maximum grade for a heavy vehicle is 15% and would only be *'satisfactory on low volume roads (very few or no commercial vehicles)'*. The table also lists gradients of 15-33% as being *'very slow'* for light vehicles and *'not negotiable'* for heavy vehicles for both uphill and downhill travel. This guide identifies in table 10.2 general maximum grades of 9-10% (and reduced by 1% if unsealed) for 60km/h design speed roads, however acknowledges grades can be justifiably steeper when:

- a) *Comparatively short sections of steeper grade which can lead to significant cost savings;*
- b) *Difficult terrain in which general maximum grades are not practical;*
- c) *Where absolute numbers of heavy vehicles are generally low; and*
- d) *Less important local roads where the costs or impact of achieving higher standards are difficult to justify.*

Out of interest some very steep sealed roads know of in northern Tasmania are:

- a) Spellmans Road, Wilmot. Rising 70m over 330m. Gradient 21%.
- b) Lemonthyme Road has a nominal maximum gradient of 20%.
- c) Balfour Street, Launceston. Rising 35m over 155m. Gradient 22%.
- d) St John Street (south of French Street), Launceston. Rising 20m over 75m. Gradient 27%.
- e) Upper York Street, Launceston. Rising 20m over 94m. Gradient 21%.
- f) Lord Street, Launceston. Rising 15m over 57m. Gradient 26%.
- g) Tamar View Drive, Riverside. Gradient 21%.

Note that the shorter sections are generally steeper than the longer sections. All are avoidable by heavy vehicles.

For the purposes of this report and satisfactory route alignment the maximum grades for a 150m length has been set at 17% for an unsealed road and 25% for a sealed road. Gradients over a sustained length of are to be set at 5% lower than this, ie at 12% and 20% respectively. These maximum gradients are generally unsuitable for heavy vehicles and an alternative should be available to ensure longer term viability of Lorinna.

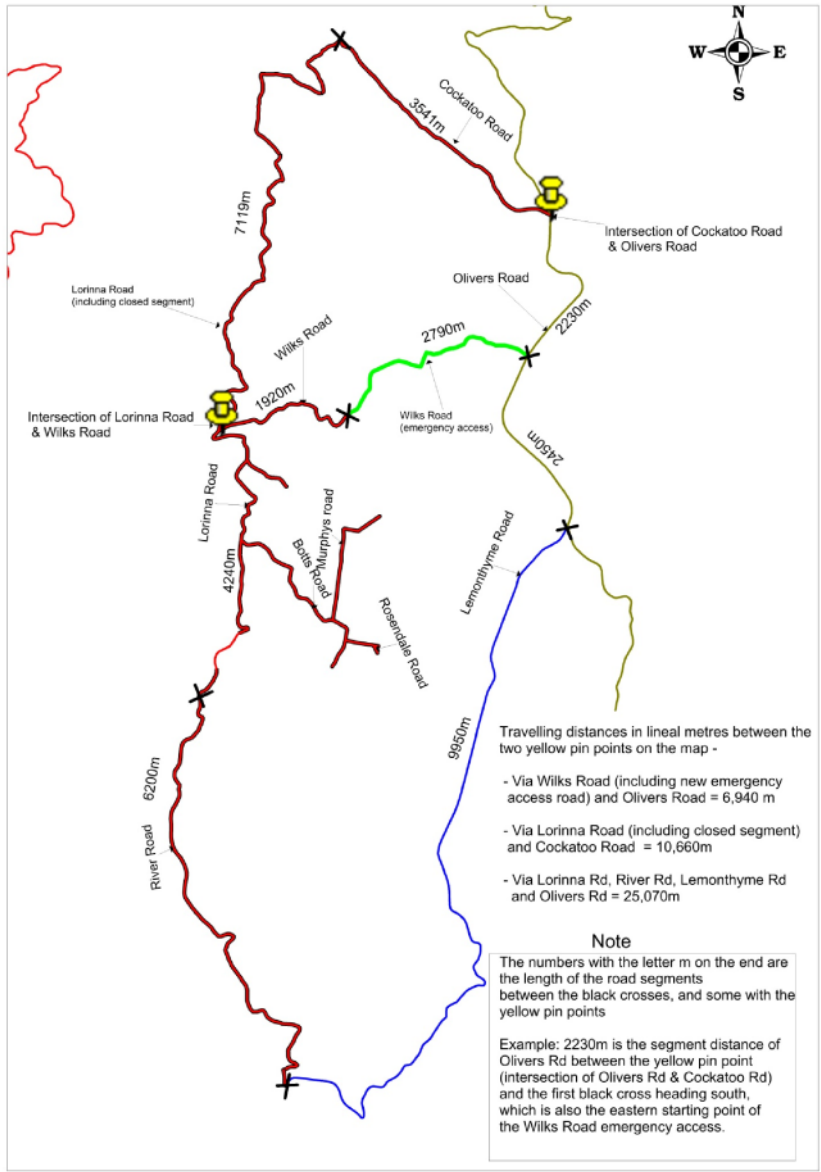
#### **2.4 Speed Limit**

Speed limits will be determined by achievable forward sight distances, road widths, traffic volumes, gradients, road curve radius and roadside hazards. Arguably a shorter road could acceptably be imposed with a lower speed limit than a significantly longer route.

#### **2.5 Emergency Access**

A secondary means of accessing Lorinna is highly desirable and is incorporated within each option presented.

2.6 Approximate Road Distances



### Section 3 – The Options

There are many options and sub-options within each.

Sub options may include 'intelligent traffic management' such as remotely or automated controlled reversal of one way routes at midday with a period of 2-way operation to allow already entered vehicles to exit, traffic sensors, cameras, automatic warning signs and variable speed limits. Many benefits could be had via a 'fixed' system of signage that could be changed manually if, for example, a route needed to be used solely by an oversized vehicle for a period.

**Each option considered meets four basic requirements:**

1. A route into Lorinna for general traffic not necessarily the same route as item 2.
2. An exit out of Lorinna for general traffic not necessarily the same route as item 1.
3. Access and egress for Heavy Vehicles but not necessarily the same route as item 1 & 2.
4. Emergency access for managed 2-way traffic and may only be suitable for 4WD.

**The shortlisted and subsequently analysed options include:**

**Option A**

One-way in Wilks Rd, out River Rd. River Rd generally one way for exiting but two-way for heavy vehicles. Wilks Rd or River Rd for emergency.

Note: Likely misuse in opposite direction and subject to land ownership on existing preferred alignment.

10.1km of road to maintain.

**Option B**

Wilks Rd (two-way with 0.5m shoulders / 4m traffic). River Rd for heavy vehicles. River Rd emergency.

Note: Subject to land ownership on existing preferred alignment.

10.1km of road to maintain.

**Option C**

Wilks Rd (two-way with 1m shoulders / 4m traffic). River Rd for heavy vehicles. River Rd emergency.

Note: Subject to land ownership on existing preferred alignment.

10.1km of road to maintain.

**Option D**

River Rd (two-way with 0.5m shoulders, / 4m traffic but with 'pinch points'), River Rd for heavy vehicles. Wilks Rd emergency.

Note: Much improve River Road but Sub-US1 at pinch points and limited barrier rail.

7.3km of road to maintain plus 2.8km of emergency route. Total 10.1km.

**Option E**

One-way in River Rd, out Lorinna Rd. River Rd generally one way for entry but two-way for heavy vehicles. Wilks Rd, Lorinna Rd or River Rd for emergency.

Note: Likely misuse in opposite direction plus a long access and large network to maintain.

16.8km of road to maintain plus 2.8km of emergency route. Total 19.6km.

**Option F**

Wilks Rd (two-way with 0.5m shoulders / 4m traffic). River Rd for heavy vehicles. Lorinna Rd and River Rd emergency.

Note: Subject to land ownership on existing preferred alignment.  
10.1km of road to maintain plus 9.5km of emergency route. Total 19.6km.

**Option G**

Wilks Rd (two-way with 1m shoulders / 4m traffic). River Rd for heavy vehicles. Lorinna Rd and River Rd emergency.

Note: Subject to land ownership on existing preferred alignment.  
10.1km of road to maintain plus 9.5km of emergency route. Total 19.6km.

**Option H**

River Rd (two-way with 0.5m shoulders / 4m traffic), River Rd for heavy vehicles. Wilks Rd emergency.

Note: Longest return journey.  
7.3km of road to maintain plus 2.8km of emergency route. Total 10.1km.

**Option I**

One-way in Wilks Rd, out Lorinna Rd. River Rd for heavy vehicles. Wilks Rd, Lorinna Rd or River Rd for emergency.

Note: Long term failure risks, Wilks Road subject to land ownership on existing preferred alignment, long network to maintain and Lorinna Rd likely to be misused in opposite direction.  
19.6km of road to maintain.

**Option J**

Lorinna Rd (two-way with 0.5m shoulders / 4m traffic but with 'pinch points'). River Rd for heavy vehicles. Wilks Rd or River Rd emergency.

Note: Improved Lorinna Rd but sections remain Sub-US1 at various pinch points. Pitt and Sherry allowed only 500m barrier rail, has likely long term failure risks, low standard main access and a large network to maintain. Council has previously excluded this as an option.  
16.8km of road to maintain plus 2.8km of emergency route. Total 19.6km.

**Option K**

River Rd (two-way with 1m shoulders / 4m traffic). River Rd for heavy vehicles. Wilks Rd emergency.

Note: Longest return journey. 3.65km barrier rail allowed for.  
7.3km of road to maintain plus 2.8km of emergency route. Total 10.1km.

**Option L**

River Rd (two-way with 0.5m shoulders / 4m traffic but with 'pinch points'), River Rd for heavy vehicles. Wilks Rd & Lorinna Rd emergency.

Note: Much improved River Road but Sub-US1 at pinch points and limited barrier rail.  
7.3km of road to maintain plus 12.3km of emergency route. Total 19.6km.

**Option M**

River Rd (two-way with 0.5m shoulders / 4m traffic), River Rd for heavy vehicles. Lorinna Rd and Wilks Rd emergency.

Note: Longest return journey. 3.65km barrier rail allowed for.  
7.3km of road to maintain plus 12.3km of emergency route. Total 19.6km.

**Option N**

River Rd (two-way with 1m shoulders / 4m traffic). River Rd for heavy vehicles. Lorinna Rd and Wilks Rd emergency.

Note: Longest return journey. 3.65km barrier rail allowed for.



7.3km of road to maintain plus 12.3km of emergency route. Total 19.6km.

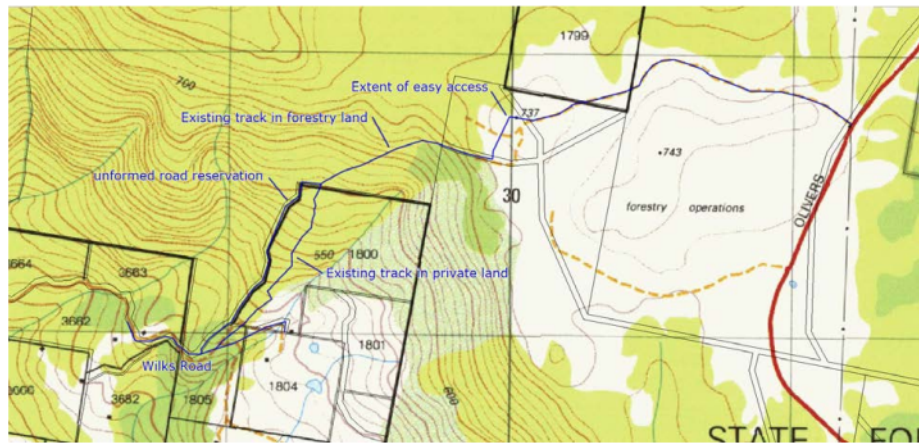
**Options not considered include:**

1. In Lorinna Rd, out Wilks Rd - instead use steepest for entry and flatter road for exit.
2. In Lorinna Rd, out River Rd - instead use steepest road for entry and flatter road for exit.
3. In River Road, out Wilks Rd - instead use steepest road for entry and flatter road for exit.
4. Lorinna Rd for heavy vehicles (8t limit per the Pitt and Sherry Report).
5. Wilks Road for heavy vehicles due to likely gradients up to 24% over a short length referred to later in report.

## Section 4 - Wilks Road Extension to Olivers Road

This potential alignment was assessed on site by the stakeholder group on Friday 27 May 2016 by driving in off Olivers Road to the end of a forestry track and then walking down the road reservation to Wilks Road as depicted in blue on the following image.

This alignment has long been touted as a viable yet overlooked option. A site inspection and assessment was warranted in order to move the whole project forward with a high level of confidence.

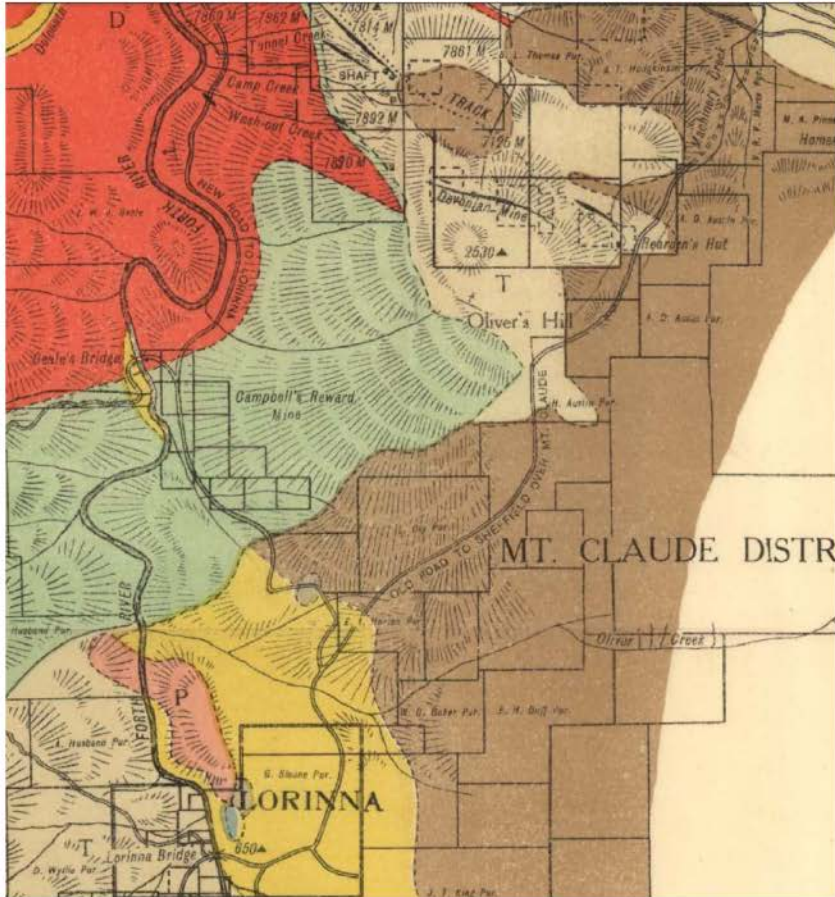


The access point off Olivers Tourist Road is 2.5km north from the junction with Lemonthyme Road. From this point a relatively flat well established single lane forestry track heads in a westerly direction for 1.3km to a high point shown as 737m elevation on various maps. The descent was then made on foot along a 4WD track in a west-south westerly direction for 830m through forestry land before reaching the northern boundary of the Bruce and Julie Page property (title reference 106253/1). At this point the track entered that property but the group continued through bush in a westerly direction for approximately 75m before heading south-south westerly for approximately 700m down a steep unformed road reservation before entering Wilks Road. The total distance from Olivers Road to Wilks Road along this route is 2.9km. It is a further 1.8km down Wilks Road to its commencement point at the junction with Lorinna Road. After consulting with Bruce and Julie Page some members of the group exited up the existing track within their private land slightly east of the alignment just descended for comparative purposes.

It is clear that this, or a very similar alignment provided access in out or Lorinna historically in the time of bullocks when up to 36 would be used to traverse steep grades with heavy loads. This can be seen on the following image that shows the old Land District Chart for the area overlaid with the current cadastral (property boundary) layer.

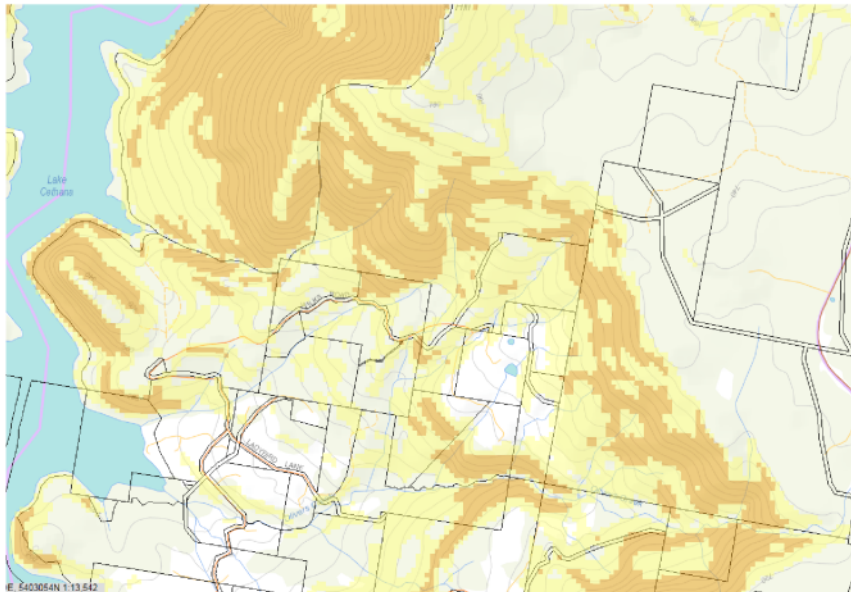


The following Geological Sketch Map of the area dating back to c1915 clearly shows the 'Old road to Sheffield over Mt Claude' in this vicinity, however when trying to scale and reference others items it becomes clear that it can only be considered an indicative 'sketch'.

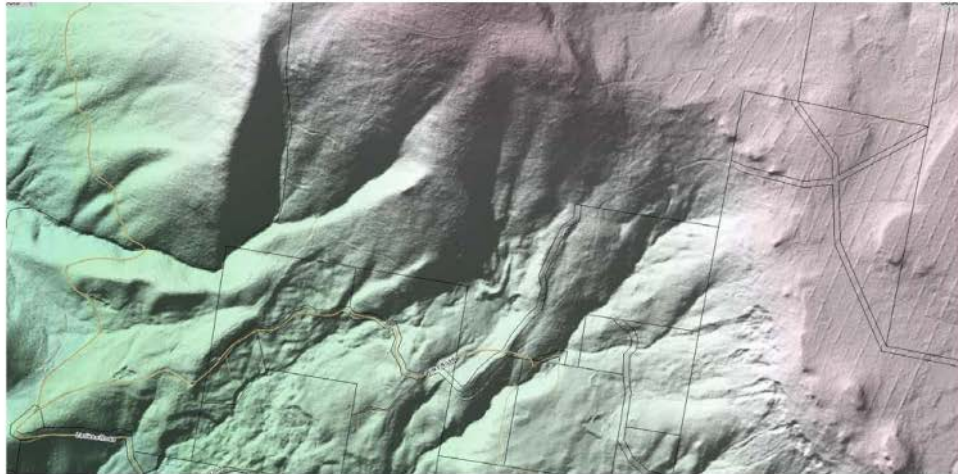


The following image indicates landslide vulnerability and shows steepness of the terrain. The light lemon colour shows 'low hazard' steepness of between 20 and 36% and the light brown as 'medium hazard' and a steepness greater than 36%. This shows that Wilks Road and the possible extension of such is the 'flattest' route in this vicinity. Any 'north of Wilks Road road' alignment will be difficult and very expensive to achieve because it will:

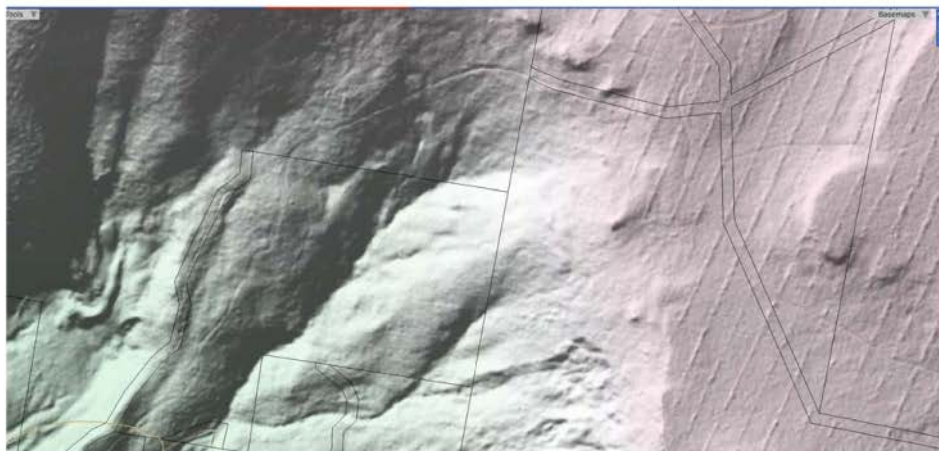
- a) Traverse steeper topography;
- b) Require construction of a longer section of new road rather than extend or upgrade existing;
- c) Require the road to be built across the contours to reduce steepness with associated cut, fill, drainage and retaining structures; and
- d) Most probably require 'switchbacks' that may be difficult to traverse by larger vehicles.



The following 'hillshade' rendering image of the general Wilks Road alignment depicts the topography in a way that may be more meaningful to some. The steepest areas are shown darker when they face east or lighter when they face west.



Similarly the following 'Hillshade' rendering shows the area extending from Wilks Road towards Olivers Road and the road reservation on a darker alignment than the existing track to the east. Note the existing track can be seen.



The Lorinna Road junction with Wilks Road is located at the 300m contour and the ridge near Olivers Hill at 730m, a rise of 430m. The existing length of Wilks Road and the possible extension to the top of the escarpment is approximately 3.3km long and represents an average grade of 13%. The alignment includes significant sections both steeper and flatter than this average gradient. Whilst a short 150m section of Wilks Road is around a 20% grade the average from Lorinna Road to the commencement of the unused road reserve rises 180m over 1.8km, an average grade of 10%. A section of road reserve immediately west of the private landholding from Wilks Road to the plateau rises 125m from 480m to 605m elevation over a length of 570m, representing an average gradient of 22%. To reduce the gradient over this length to 12% would require the alignment to be 471m longer (ie nearly doubled in length). This 570m long section also includes a relatively long 205m section at an average grade of 29% and a steep 'pinch' of nearer 40%. Unfortunately the alignment is bound by private landholding to the east and a steep escarpment to the west which limits opportunity to vary this alignment.

These gradients as calculated from electronic mapping of the areas were verified on site during the walk through with some sections measured at between 20 to 35% (displayed as 12 to 19 degrees on the device used).

Whilst this route provides a very short access into Lorinna the gradients are likely to render it unsuitable as a primary access for all vehicle types unless extensive 'grade averaging' was undertaken and would quite possibly require working beyond the existing bounds of the road reservation. Even if sealed the gradients are most likely too steep based on the deduced criteria established in Section 1 of this report.

The track currently used as an emergency access and roughly parallel and 40m east of the road reservation in the Bruce and Julie Page property at 197 Wilks Road includes a 200m long section at 25% gradient and is readily traversable by 4WD, road-trail motorbike, quad bike or heavy machinery. With some localised gradient averaging and sealing could potentially be traversed by any manner of vehicle as an emergency exit or entry to the area. Measures would have to be put in place at either end of the Page property to prevent unauthorised access at other times.

The group acknowledges and thanks Mr Glen Bakes and Mr Ian Hayes for the research, reconnaissance and time taken on the 27 May to familiarise the party with this alignment.

Subsequent to the emergency access being gravelled and established through the Page property in June 2016 the steepest sections were measured to include a very short pinch of 34.5% near the lower end, followed by a section approximately 100m long at 27%, another 50m long section at 34.5% and a final steep part just north of the Page's boundary varying between 27% and 32.5% over a distance of approximately 75m. This was verified on site by the Manager Engineering on the 4 August as being unsuitable as a loose gravel surface for traversing in 2WD by the general public without potentially causing damage to the track, vehicle or safety.

A concept to even out the grade along the Page property 4WD emergency track based on 10m contour lines identified a typical gradient of 20% and with a maximum gradient of 24% over a 31m length could be achieved with cut and fill depths of up to 2.7m. A further concept to set a maximum grade of 20% would require a length of 1070m and require up to 5.5m cut and fill depths and is

considered unachievable. If likely to be progressed any further this would need to be verified by detailed survey.

Much of the above was observed before the opening the emergency access after the June 2016 flooding following the temporary closure of River Road but has since been verified and the community can now visualise what gradients of up to 34.5% appear like.

#### **Strengths**

- That it would provide a second significantly different alignment in addition to River Road for emergency exit.
- A significantly shorter route than using River Road and not quite to the same elevation.
- Is substantially perpendicular to the contours and drainage efforts would be minimal.
- No evidence of past landslide was noted.

#### **Weaknesses**

- Long, steep potentially unsealed gradients with high ongoing maintenance and safety implications unless sealed with potential need for barrier rail.
- Upgrade of existing Wilks Road may be required.
- New works and new alignment may be subject to planning, appeals, significant investigations, flora, fauna etc.
- Still travels to approx. 740m contour which is subject to snow and ice.
- May be expensive if created as the primary access / egress for the community with adequate width.
- Cannot be staged.
- Potential detailed geotechnical investigations and design may be required.
- Planning permit and approval from landowners may be required.
- Not suitable for buses and heavily laden trucks.
- Unless 'grade averaging' occurs the available alignment may not suitable for two wheel drive (especially front wheel drive) vehicles unless sealed.
- May not be welcomed by those that currently reside in Wilks Road.

#### **Opportunities**

- Recently constructed with outside funding assistance.
- Now a known and used route that can be discussed with relative confidence.

#### **Threats**

- Alignment may need lengthening to reduce gradients and result in switchbacks, cross slope construction with cut/fill.
- A better alignment is on private land which may not be acceptable by the owner.
- Longitudinal drain washout and erosion.
- That the exit contour will be too high and sections of Wilks Rd and Olivers Rd will be subject to snow and ice.



- To achieve a suitable alignment it may need to be located partly on private land and forestry reserves which may be unacceptable to owners.
- May never be accepted by all of the community.
- The longer the process the more divided the community will get and potential lessened faith in Council to resolve in an adequate timeframe.
- May 'open up' the community more than they wish.

## Section 5 - River Road

A publication by the Department of Mines titled Geological Survey Bulletin No. 29, the Mining Fields of Moina, Mt. Claude and Lorinna, 1919 provides some interesting, yet brief history in relation to River Road. Section V – Transportation and Communication, commencing on Page 18 states that the ‘new’ road to Lorinna (includes Lorinna Road between Cockatoo Road and Lorinna) along the contour did not exist prior to the preceding 10 year period. It goes on to state that ‘the extension of this road to the Mt. Pelion wolfram mines is now under construction’. This would be making reference to what is now known as River Road.

In past reports River Road has been referenced in a southerly direction with Pioneers Road representing chainage 00. Chainage 4.8km represents the logging spur and the total length out to Lemonthyme Road is 6.6km. River Road starts at RL 305 and varies gradually between upper and lower limits of 325m and 245m before finishing at an elevation of 295m.

River Road does not contain any dry stone retaining walls and any previous land instability is understood to be very minor and localised. It is expected that much of this would be a result of the low but steep cuts on the top side of the road. Localised cross slopes of up to 84% have been calculated from available contour mapping but are more typically around 50% and flatter.

The road was assessed for 20 tonne vehicles by Geoton in 2009 and found to be of adequate strength.

### Strengths

- Construction to upgrade and improve can be staged or targeted over a number of years and put to immediate use.
- Would be suitable for long and heavy vehicles.
- Land stability and alignment has been tested for many years.
- Steep gradients are currently sealed and suitability for 2wd in all but snowy or icy conditions.
- Steep gradients are not ‘owned’ by Council.
- Unlikely to require planning or other extensive pre-works requirements.
- Existing relatively steep batters demonstrate achievable slopes for new batters.
- Wilks Road now provides an ‘alternative’ exit to River Road that did not previously exist.

### Weaknesses

- Significant vegetation removal on top sides of batters. Transport out may be somewhat tedious.
- Flora values are known to exist. Likely to be some threatened species to address in immediate vicinity (Eucalyptus Radiata).
- Current forward sight distance on convex bends is poor.
- Longest route and to the highest elevation 770m.
- Some periodic inconvenience during time of works (not such a problem if widened) similar to other areas with sole access.
- Sustained significant damage in June 2016.

### **Opportunities**

- Can commence at relatively short notice and with tangible benefits.
- Most suitable for future heavy vehicle access and support future development of Lorinna.
- State Government to take over responsibility Lemonthyme Road from Hydro Tasmania.
- Forestry may transfer River Road at no cost or Council declare and take responsibility.
- Barrier rail can be installed at a later date without upsetting rock walls.
- Possibly the most 'saleable' to the wider community outside of Lorinna.

### **Threats**

- Unlikely to be universally accepted by the Lorinna community.
- That 'ownership' of River Rd cannot be secured.
- The longer the process the more divided the community will get and potential lessened faith in Council to resolve in an adequate timeframe.
- Some of the community may still see it as a 'temporary' arrangement and will continue to lobby for other alignments.

## **Section 6 – One-Way Using Lorinna Road, River Road and/or Wilks Road**

Also of interest from the earlier referenced 1919 Department of Mines publication is the statement that ‘Between Round Hill and Tin Spur the road follows a very steep sidelong, and is so narrow that it becomes dangerous for two vehicles to pass.’ This would most probably be referencing the northern most section of Lorinna Road including White Rock Corner where the road is cut at an average of 2.15% longitudinal grade along a cross slopes of up to 125%.

This route has been analysed many times and appears in numerous reports, hence it is not reported on in any great detail within this assessment.

### **Strengths**

- Limited to nil road widening required on either road.
- Low chance of two vehicle crashes.
- Low gradients.
- Does not reach the same elevation as the alternatives.

### **Weaknesses**

- Chance of single vehicle crashes may increase due to speeds or complacency.
- Initial roadworks on Lorinna Rd are ‘specialised’ and expensive especially near the large culvert wash-out.
- Likely to need further detailed assessments by a consultant and specialised repair works especially at failed portions.
- Generally twice the length of road for Council to maintain and keep clear.
- Reliance on drystone rock walls and potential damage by age, water, trees, traffic, landslip etc.
- A need to maintain additional bridges and large culverts assets.
- Some past repairs have an unknown lifespan.
- Drystone retaining walls with potential failures into the future and unknown associated costs or ‘downtime’ when a narrow (ie predominantly one way) River Road will be relied on.
- Specialised annual inspection obligations and potential need to review applied load limits and potentially increased to the point of failure.
- Relies on travel at 770m elevation where subject to snow and ice.
- If Lorinna Road was established as one-way only it will not permit entry and exit during times or hardship unless under strict and potential escorted arrangements.
- Significant damage in June 2016

### **Opportunities**

- Would provide an alternative second relatively level point of exit or entry that will not need to be ‘prepared’ for use.
- If exit (following overnight snowfall) is via Lorinna Road this would create a max elevation of approx. 625m at Olivers Road / Cockatoo Road junction or 445m if heading to Cethana Road.

### **Threats**

- That one way use will not be adhered to especially early or late in the day creating a hazard for legitimate users.
- That due to specialised nature of works and significant unknowns that once Lorinna Road was commenced that it cannot be 'finished short' or pulled out of without that investment being wasted. Potential for cost blow outs and poor wider general public perception.
- That the direction for entry and exit will not be accepted by all.
- That the longer term 'unknowns' will become onerous.

## Section 7 - Costing

No allowance in the costing has been made for electronic signage, major wall failures, landslips & major washouts, travel time, fuel and vehicle maintenance costs. No contingency or overhead has been applied.

Spreadsheets have been used to generate project scoping costs and contain up to 43 columns of data and calculations, hence it is not possible or practical to include and describe each within this report. Rates used are consistent with those used by Pitt and Sherry in their December 2013 report 'Lorinna Road Upgrade Assessment' thereby allowing the Pitt and Sherry cost to be used directly and without alteration. Note that the capital construction cost for Lorinna Road has been increased from \$1,503,860 by \$311,000 from that in the Pitt and Sherry report as a result of damage sustained in the June 2016 flooding.

Capital costs for each option have considered:

1. The total length of roads and the number sections that can be treated as typical portion.
2. Existing cut height on top side of road
3. Existing upslope above existing cut height
4. Existing gravel pavement width
5. Existing 'levelled' formation width
6. Table drain width
7. Cut shoulder
8. Trafficable width
9. Outer shoulder total width
10. Formation widening required to meet standard
11. Cubic metres and cost to excavate and dispose / reuse
12. Height increase if excavated material to be used as subbase
13. New pavement width to meet standard
14. Sub-base gravel
15. Base gravel
16. Vegetation removal cost
17. Barrier rail were appropriate
18. Roadside drain clearing, opening culvert inlets, general culvert upgrades, repairs and guideposts
19. Rock lining drains on steep grades
20. Land acquisition
21. Gradient averaging on Wilks Rd extension
22. Road sealing where steeper than 17%
23. Survey, design, engineering and supervision.

Maintenance costs for each option have included:

1. The square metres of US2 road to maintain for each option and the annualised pavement surfacing cost.
2. The square metres of US1 road to maintain for each option and the annualised pavement surfacing cost.

3. The square metres of Sub-US1 road to maintain for each option and the annualised pavement surfacing cost.
4. Length of road to maintain for as two-way, one way and heavy vehicles for regular traffic.
5. Cost to maintain any access used only as an emergency route and the distance of emergency only access.
6. Total km of road that would become maintainable.
7. Routine annual cost – fill and compact potholes
8. Routine annual cost – clear drains / culverts of isolated blockage or debris
9. Periodic costs – trees, remove fallen tree, twice per year
10. Periodic cost – rockfalls, small, clear twice per year
11. Periodic cost - stone walls, minor repair, every second year
12. Periodic cost - drainage, recut drains, clear blocked culvert – every third year
13. Periodic cost - vegetation clearing, every second year
14. Periodic cost – snow clearing
15. Unique item (eg known future replacement of Silver Falls Bridge)

The annual maintenance cost was multiplied out over 20 years and added to the capital cost in order to gain a better understanding of long term ownership costs. This avoids a low capital cost / high maintenance cost project 'jumping out' as a preferred option over a low maintenance cost / high capital cost solution. This total was then divided by 20 to gain what could be loosely termed as an annualised 20 year total cost.

A tabulated summary of the 14 options considered follows:

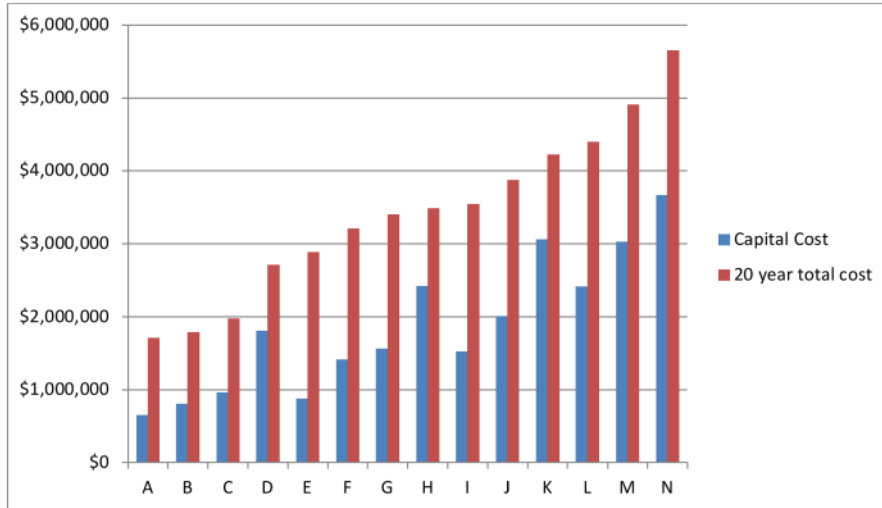
Option	Capital cost (inc. non specialised survey, design, engineering and supervision etc.)	Annualised maintenance and once-off item costs	20 year total cost (ie all capital plus 20 years of maintenance in current \$)	Annualised 20 year total (capital plus maintenance costs)
A	\$649,121	\$52,945	\$1,708,017	\$85,401
B	\$803,880	\$48,945	\$1,782,776	\$89,139
C	\$957,462	\$50,945	\$1,976,358	\$98,818
D	\$1,805,011	\$45,245	\$2,709,907	\$135,495
E	\$875,958	\$100,501	\$2,885,984	\$144,299
F	\$1,408,743	\$89,951	\$3,207,769	\$160,388
G	\$1,562,325	\$91,951	\$3,401,351	\$170,068
H	\$2,421,345	\$53,066	\$3,482,670	\$174,133
I	\$1,518,479	\$101,201	\$3,542,505	\$177,125
J* <sup>1</sup>	\$2,002,946	\$93,501	\$3,872,972	\$193,649
K	\$3,059,840	\$58,281	\$4,225,451	\$211,273
L	\$2,409,873	\$99,287	\$4,395,614	\$219,781
M	\$3,026,208	\$94,073	\$4,907,662	\$245,383
N	\$3,664,703	\$99,287	\$5,650,443	\$282,522

\*<sup>1</sup> This option includes \$1,503,860 (excluding contingency) as estimated by Pitt and Sherry in 2013 and \$311,000 additional works following the June 2016 flooding. The Pitt and Sherry report was considered to err on the side of caution with respect to the need to revisit previous 'temporary' repairs and the cost of works at, for example, the major washout at Chainage 3300 where a \$79,000 allowance had been made. The total cost of works including a 10% contingency was believed to approach \$2,500,000 and Council made a decision to not upgrade Lorinna Road to that standard, however it is included above assessment for comparative purposes. Using \$2,500,000 will push this option further down the above table.

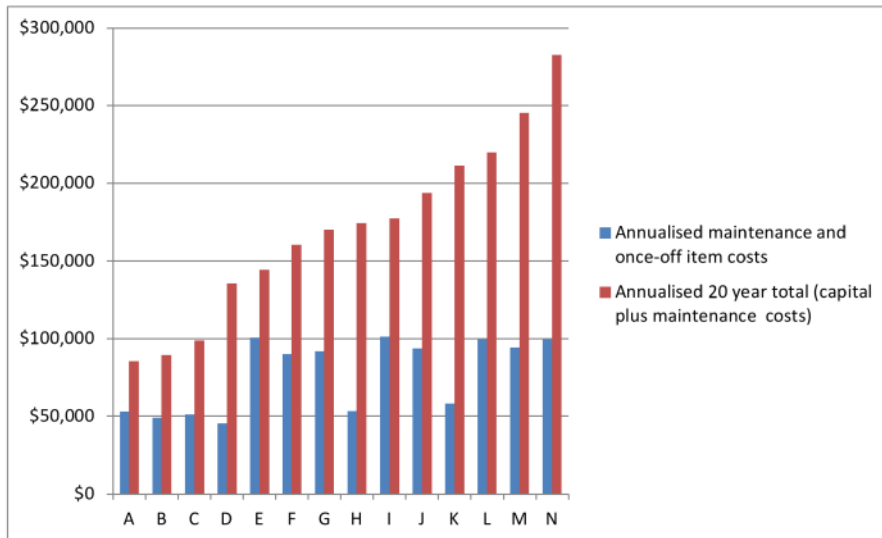


The above table is graphed in two ways:

Below: Total costs over 20 years



Below: Annualised costs in current dollar terms



## ATTACHMENT M– Discussion Report 4

### 11.1.2 Lorinna Access Submission Summary

Submission Number	River Road Upgrade	Wilks Road/Reserve Road	Lorinna Road reopened
1	2. Emergency & heavy vehicle	1. support as main two-way access	3. Not supported
2	2. Emergency & heavy vehicle	1. support as main two-way access	3. Not supported
3	2. Emergency & heavy vehicle	1. support as main two-way access	3. Not supported
4	2. Emergency	1. support as main two-way access	
5	2. Emergency	1. support as main two-way access	
6	2. Emergency	1. support as main two-way access	
7	2. Emergency	1. support as main two-way access	
8	2. Emergency	1. support as main two-way access	3. Not supported
9	2. Emergency & heavy vehicle	1. support as main two-way access	
10		1. support as main two-way access	
11	2. Emergency	1. support as main two-way access	
12	1. support as main two-way access	2. Emergency	3. Not supported
13		1. support as main two-way access	3. Not supported
14	2. Emergency	1. support as main two-way access	
15		1. support as main two-way access	
16	1. support as main two-way access		
17	2. Emergency	1. support as main two-way access	
18	2. 2WD/Heavy Vehicle	1. support as main 4WD access	
19	1. River Road to US1 standard	3. Not supported	2. Emergency <b>Note:</b> Support reopening of Lorinna Road - given this isn't an option will 'come in behind upgrade River Road'
20		1. support as main two way access	

Submission Number	River Road Upgrade	Wilks Road/Reserve Road	Lorinna Road reopened
21		Not supported <b>Note:</b> opposed to acquisition of ANY land for future access roads. Opposed to any access via the reserved road and Wilks Road	
22		Not supported <b>Note:</b> opposed to acquisition of ANY land for future access roads. Opposed to any access via the reserved road and Wilks Road	
23	Wilks Road - further investigation needed into the possibility of landslides. A brief geomorphological investigation of the area reveals several historical landslide scarps, with movement of the debris evident over distances of 1km or more. Advises Council write to the Director of Mineral Resources Tasmania to request the involvement of their Geohazard expertise.		