



ENGINEERING ASSESSMENT OF GOCUP ROAD BETWEEN TUMUT AND GUNDAGAI

FOR TUMUT AND GUNDAGAI COUNCILS

Prepared by PEECE Pty Ltd

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EXECUTIVE SUMMARY

The Gocup Road is a two-lane regional road that currently carries an estimated 234 heavy vehicles and 1,229 light vehicles over its entire length each weekday. It is an important transport link for the timber companies in and around Tumut as it provides the main road link to the Hume Highway for northbound traffic.

Timber production is expected to increase the heavy vehicle haulage on Gocup Road over the next few years. For Visy Pulp and Paper Pty Limited this will result from the implementation of Stage 2 of their plant development and a major increase in timber hauled from their plantations in the Macquarie timber region near Bathurst / Oberon. To more effectively manage their back-loading Visy will be hauling 60% of their export products to the port of Sydney rather than to Melbourne. Weyerhaeuser Australia is also anticipating strong growth in both input and finished products haulage that will impact on Gocup Road.

Based on the forecast increase in the transport task, the number of heavy vehicles is expected to increase to 402 heavy vehicles per weekday. This represents an increase of 168 heavy vehicles per day, 131 of which will be fully loaded. The existing Gocup Road is barely adequate for the existing heavy traffic volumes but will become a significant road safety risk during the working week when the number of heavy vehicles increases by 70% each day.

A number of design options were considered for upgrading Gocup Road to a safe standard for future heavy haulage patterns. They ranged from the construction of a third lane over its entire length to a more modest widening and overtaking lane option.

The provision of a third lane in a safe manner could only be provided with significant improvement to vertical and horizontal alignment and at an estimated cost of the order of \$90 million. Any attempt to provide a continuous third lane without improving the vertical and horizontal alignment would create a dangerous situation.

However, the cost to widen the existing road over its entire length to a 2 x 3.5m sealed traffic lanes width 2m shoulders on either side (1m sealed) and to provide five overtaking lanes at strategic locations along the road is estimated at \$24.56 million.

It is proposed that the Councils undertake the work over five years with seven major construction projects ranging in price from \$2.0 to \$4.8 million each.

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1. INTRODUCTION

1.1 Purpose of the Report

The purpose of this report is to document the changes to the heavy vehicle traffic patterns on the Gocup Road resulting from proposed developments and growth in the timber industry in and around Tumut. Gocup Road is a two-lane regional road providing the main road link for northbound traffic from Tumut to the Hume Highway.

Gocup Road serves not only the interests of Tumut but also the entire timber industry in as it is northern link of the main north-south spine road linking all the timber interests in the South West Slopes Region.

The report estimates the future heavy vehicle traffic and outlines the costs to bring the road to a standard that will allow the heavy traffic to mix with light vehicles in a safe way.

1.2 Overview of the Timber Industry in the Region

The South West Slopes Region of NSW is unique to Australia in that timber is grown, harvested and processed locally, to its highest value added form. The product from this region, being value added locally, is especially significant to Australia's balance of payments. It contributes approximately \$1 billion in import replacement value on the Australian domestic market.

The plantation sector attained commercial significance as a consequence of plantings made under the Commonwealth Softwood Forestry Agreements of 1967 and 1972. About 30,000 hectares were planted in the period. Total softwood plantation area in the region currently managed by Forests NSW is around 85,000 hectares with a further 28,000 hectares owned by private interests.

Visy Pulp and Paper Pty Limited (Visy) has established a kraft pulpmill near Tumut that has an intake of around 650,000 tonnes of pulplogs and 350,000 tonnes of sawmill residue (woodchips) annually. The annual supply of pulplogs from Forests NSW is around 550,000 tonnes with the pulplogs from private forests making up the balance.

Visy plans to extend this capacity over the next few years in a Stage 2 of their development. Visy and Weyerhaeuser draw most of its timber supply from within the region but increasingly from plantations and import products from the Bathurst / Oberon, ACT and Bombala regions.

Weyerhaeuser Australia has two mills; one at Tumut and the other at Gilmore and between them employs approximately 270 people. The company mills

approximately 550,000 cubic metres of logs per annum and sells approximately 220,000 cubic metres of sawn and value added timber.

The combined South West Slopes of NSW and North East Victoria is now the largest softwood producing area in Australia, with a combined total of more than 150,000 hectares of plantation providing more than 2,000,000 tonnes per annum of timber products to regional mills.

A recent study by URS Forestry revealed that in 2002/03 the region produced approximately 900,000 m³ of sawlogs and 750,000 m³ of pulpwood. About 115,000 m³ of sawlogs were supplied to sawmills in north-east Victoria and the rest were supplied to saw milling, veneer manufacturing and preservation plants located in the region. Softwood pulpwood in the region is mostly used for the production of pulp and paper, and particleboard by plants within the region.

The forest industry in the region produces a wide range of products, including sawn timber, pulp and paper and panel board. The three major sawmills produced about 275,000 m³ of woodchips of which almost 90% were used for the manufacture of pulp and paper in the region. The balance was used for the manufacturing of particleboard in both the region and Victoria. Of the other residues, shavings were used for manufacturing particleboard and boiler fuel, sawdust for boiler fuel and pine bark for landscape suppliers in Sydney, Melbourne and Canberra.

The region currently produces 1.6 million tonnes of softwood annually. With additional maturing plantations and the Visy Mill coming into production the total tonnage of softwood log and product haulage has increase to more than 4.4 million tonnes.

Figures 2.1 and 2.2 shows the growth in total timber harvested and the total tonnages on the road system between 1990 and 2006.

Figure 2.1: Total Timber Volumes Harvested

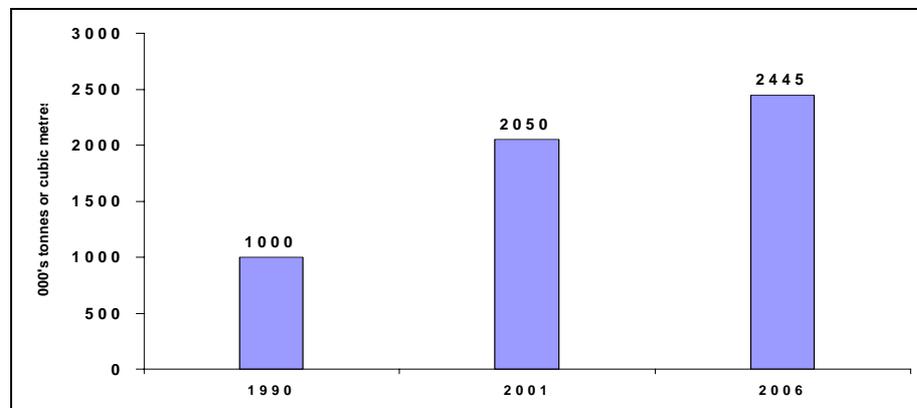
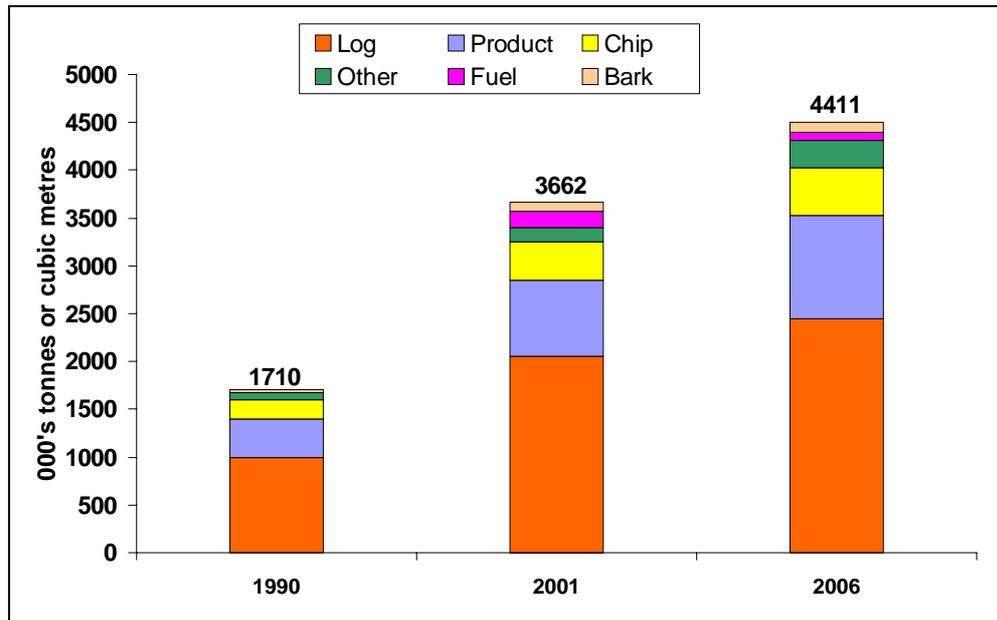


Figure 2.3: Total Tonnages on the Road Network

1.3 Road Infrastructure Issues

The increased use of B-doubles by the timber industries in preference to the conventional semi-trailers has increased the efficiency of the transport task in recent years. This trend is likely to continue as other freight efficient vehicles become available in rural areas. The recent evaluation of the Super B-doubles in the Melbourne port is an example of where a longer vehicle can translate directly into productivity gains.

These freight efficient vehicles are an important technology development that will reduce the number of heavy vehicles on the road system. However, they have an impact on road design standards and pavement design. This is an issue for the local Councils in maintaining and developing the road system, particularly as the roads carrying forest products are aging and carrying loads far in excess of their original design.

Road safety is of general concern to most rural communities and the Tumut region is no exception. Many of the region's roads, including the Gocup Road, do not have any opportunities for overtaking slow moving timber vehicles. As the number of heavy vehicles increases with the growth of the timber industries, there will be increasing community concern at the impact on road safety.

The Gocup Road in particular reflects this conundrum. It is a crucial link connecting Tumut and the major timber processing operations with the Hume Highway. Any region growth in the timber industries will inevitably result in increase tonnages and number of heavy vehicles supporting the

industry. To some extent, vehicle technology will reduce the number of vehicles on the road, as evidenced with the introduction of the B-double to replace the semi-trailer and in all likelihood in the future with the acceptance of such vehicles as the Super B-double, being considered at the moment. These trends are inevitable and in many respect desirable for the transport task.

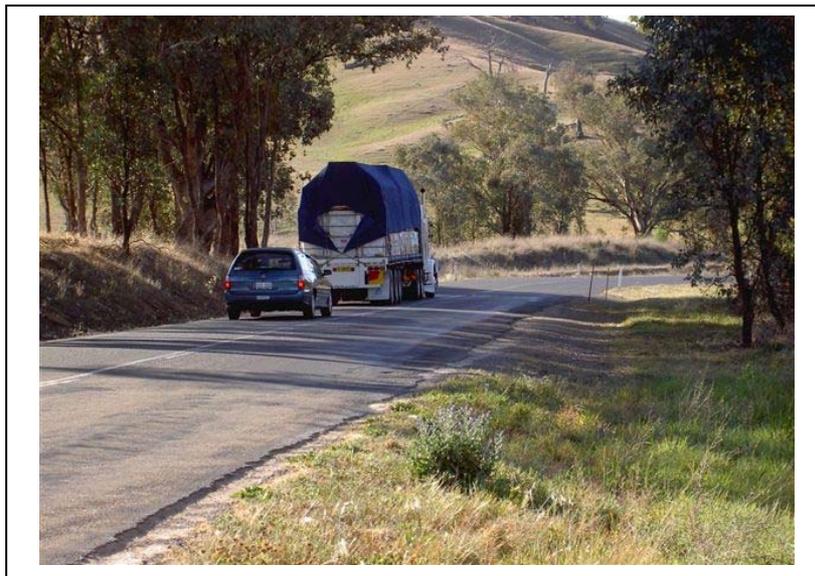
The challenge for the local Councils is to meet the challenge with a solution that does not materially impact on road safety. Roads need to be wide enough for the heavy vehicles to travel safely and there needs to be sufficient passing opportunities for them to mix safely with light vehicles. This is essentially a matter of road engineering design.

2. GOCUP ROAD

2.1 Existing Road Condition

Gocup Road is a two-lane rural road between the towns of Tumut and Gundagai on the South West Slopes of NSW and provides the most direct link between Tumut and the Hume Highway for northbound traffic. The road is 30.1km long between Tumut and South Gundagai with a further 300m connection along Mount Street to the Hume Highway for northbound traffic. Table 2.1 summarises the road lengths.

Gocup Road is currently classified as a Regional Road under State classification and identified as MR 279. In the recent Roads and Traffic Authority road classification review, Tumut and Gundagai Councils made a submission to re-classify the road as a State Road. No advice has been received to the submission.



The road was built to 1960's road design standards with horizontal and vertical alignment designed to minimise earthworks construction. Apart from recent rehabilitation where the roadway has been widened, it is generally of 6.8m wide sealed width with a 1m unsealed shoulder on both sides.

The terrain is undulating in the Tumut end of the road but quite hilly towards Gundagai. The road alignment has a sequence of curves and hills with no overtaking lanes. With the growth in the number of slow moving heavy vehicles, the inability to overtake is seen as a significant constraint to free flowing traffic and an increased safety hazard for light vehicle traffic.

Table 2.1: Road Length between Tumut and the Hume Highway

Council	Link	Sealed Length, km	Unsealed Length, km	Total Length, km
Tumut	Gocup Rd between Snowy Mountains Highway at Tumut and the Tumut / Gundagai Shire Boundary	16.4	0	16.4
Gundagai	Gocup Rd between the Tumut / Gundagai Shire Boundary and Mount Street, South Gundagai	13.7	0	13.7
	Connection from Gocup Road to the Hume Highway via Mount Street	0.3	0	0.3
Total		30.4	0	30.4

2.2 Current Traffic Volumes

The current Monday to Friday weekday traffic volumes on Gocup Road are summarised in Table 2.2. These are based on recent traffic volumes over the entire length of the road. The weekday traffic volumes are reported because the timber haulage is undertaken mainly by contract between Monday and Friday.

Table 2.2: Weekday Traffic Volumes on Gocup Road

Council	Location	AADT ⁽¹⁾ (2006)	No of LV per day	No of HV per day	% HV
Tumut	North of Gilmore Creek bridge, Tumut	2,015	1,451	256	15%
	Tumut / Gundagai Shire Boundary	1,770	1,229	234	16%
Gundagai	South Gundagai, near the cemetery	1,824	1,268	278	18%

Note (1): AADT is the average number of equivalent two axle vehicles as reported by the RTA. The actual number of vehicles per day is less because the heavy vehicle component of the traffic has on average more than two axles.

As expected the traffic volumes are highest on the outskirts of Tumut but a high proportion of the traffic during weekdays appears to be through-traffic. This reflects the timber haulage patterns of the three main timber companies. The percentage of heavy vehicle at the Gundagai end is relatively high and reflects the proximity of the abattoir.

The traffic figures show that **234 heavy vehicles travel the length of the route each weekday**. Although not reported in the above table, there has been strong 5% per annum growth in traffic volumes over recent years reflecting the increased activity in the timber industry around Tumut.

2.3 Future Timber Haulage on Gocup Road

In the consultation with Visy, Weyerhaeuser and Carter Holt Harvey, the three main timber production operations located near Tumut, it became clear that there will be significant increases in heavy vehicle traffic on Gocup Road as these companies implement proposed changes to their timber supply and transport logistics arrangements.



Visy Operations

Visy currently hauls 20,000 tonnes of finished timber products (570 trips) by B-double to Sydney each year. These trips are back-loaded from Sydney to Tumut with waste paper. All these trips use Gocup Road.

A further 52,000 tonnes of waste paper (1,490 trips) are hauled by road from Sydney to Tumut each year. A certain percentage of these trips are back-loaded with general freight.

Visy also hauls 76,000 tonnes of wood (logs or chips) along the Gocup Road from their forests in the Bathurst / Oberon region. This equates to 2,170 trips per year. A number of these trips would be back-loaded with general freight.

The total Visy operation currently involves 4,230 loaded B-double trips from Gundagai to Tumut along Gocup Road each year. At least 570 and maybe as much as 1,500 of these trips return loaded along the Gocup Road, assuming 25% back-loading of waste paper imports.

Visy also currently transports 245,000 tonnes (7,000 trips) of finished timber products by B-double for export through the Melbourne port each year. This haulage currently uses the Snowy Mountains Highway to access the Hume Highway. Visy is intending to divert 150,000 tonnes of these

timber products to the Sydney port to take advantage of the potential back-loading with wood (logs or chips) originating from its Bathurst / Oberon forest operations. This will increase the number of loaded B-double trips between Tumut and Gundagai *from an estimated 1,500 to 5,800 each year*.

The change in export logistics will not affect the number of loaded B-doubles from Gundagai and Tumut as the returning trips will either be back-loading waste product or wood (logs or chips) or will be returning empty. An estimate number of 630 trips per year will return empty.

Visy has advised its plan to start construction of its Stage 2 mill expansion in 2007 with operations expected to commence in 2009. This expansion of their plant will increase the output of the finished timber products to 30,000 tonnes and the input of waste paper to 138,000 tonnes each year.



The amount of wood coming in from the Bathurst / Oberon region and from the Bombala region as a result of the additional timber needed to supply the increased capacity will increase to 700,000 tonnes (20,000 trips). This represents an almost ten-fold increase in tonnage from the current 76,000 tonnes. This timber will be used to increase the amount of export products through Sydney to 420,000 tonnes per annum.

Stage 2 of the Visy development will increase the number of loaded B-double trips between Tumut and Gundagai from 5,800 to 13,800 and between Gundagai and Tumut from 4,230 to 23,900 each year. The increase in wood (logs and chips) in Stage 2 of the Visy development will have a major impact on both traffic lanes of the Gocup Road but particularly the lane from Gundagai to Tumut. Whilst there will be few empty return loads for the Gundagai to Tumut lane, the additional import of wood (logs or chips) will result in an estimated 11,700 empty return loads between Tumut and Gundagai or an average of 47 vehicles per weekday.

A summary of the current and future haulage implications of Visy's plans is shown in Table 2.3.

Table 2.3: Transport Impact of Visy's Expansion Plans

Stage	Tonnage, tones pa		Loaded B-double Trips pa	
	Tumut to Gundagai	Gundagai to Tumut	Tumut to Gundagai	Gundagai to Tumut
Current	52,000	148,000	1,486	4,229
Redirection of export to Sydney	202,000	148,000	5,771	4,229
Stage 2 development	450,000	838,000	13,771	23,943

Weyerhaeuser Operations

Weyhauser has three transport movements involving the Gocup Road to their plant at Tumut. The two outgoing movements involve the transport of finished timber products and landscaping pine bark and are both headed towards Sydney. The finished timber products will total 138,000 tonnes in 2006/07 and is forecast to grow to 151,000 tonnes in 2007/08. The pine bark will total 30,000 tonnes in 2006/07 and is forecast to grow to 32,500 in 2007/08.

The incoming movements involve transporting 15,000 tonnes of boiler fuel (wood waste) in 2006/07 and are forecast to increase to 18,000 in 2007/08. This fuel originates from other timber operations outside the South West Slopes Region.

A mixed fleet of semi-trailers and B-doubles undertakes the transport of these commodities. There is the potential for back-loading the transport of finished timber products and pine bark with general freight to Sydney (25% has been assumed) but there is little opportunity for back-loading the boiler fuel as the Weyhauser sources are in the ACT and Bombala regions. It should be noted that the section east of Talbingo Mountain on the Snowy Mountains Highway is not gazetted as a B-double route and therefore cannot carry the B-double timber haulage from Bombala.

This will result in a number of unloaded heavy vehicles, estimated at an average of 16 vehicles per weekday for the Gundagai to Tumut lane and 3 vehicles per weekday for the Tumut to Gundagai lane.

A summary of the current and future haulage for Weyhauser is shown in Table 2.4.

Table 2.4: Transport Impact of Weyhauser

Year	Tonnage, tones pa		Loaded Trips pa	
	Tumut to Gundagai	Gundagai to Tumut	Tumut to Gundagai	Gundagai to Tumut
2006/07	168,000	57,000	5,030	1,811
2007/08	183,500	63,875	5,494	2,038

Carter Holt Harvey Operations

Carter Holt Harvey also has three main transport operations using the Gocup Road to their plant at Tumut. They haul 9,600 tonnes of resin and 11,280 tonnes of Medium Density Fibreboard (MDF) from their plant at Oberon. The MDF is overlaid with low pressure melamine to create particleboard for distribution around Australia. The Carter Holt Harvey finished products transported north along the Gocup Road to the Sydney region total 21,000 tonnes per year. These tonnages are expected to remain stable over the next few years.

The transport is undertaken with a variety of vehicles including tankers for the resin. Carter Holt Harvey do not back load any of these trips but there is probably some back loading on the particleboard to Sydney by other companies (25% has been assumed) but little for the haulage back to Oberon.

A summary of the current haulage for Carter Holt Harvey is shown in Table 2.5.

Table 2.5: Transport Impact of Carter Holt Harvey

Year	Tonnage, tones pa		Loaded Trips pa	
	Tumut to Gundagai	Gundagai to Tumut	Tumut to Gundagai	Gundagai to Tumut
2006/07	21,000	26,130	656	817

Combined Effects of Visy, Weyerhaeuser and Carter Holt Harvey

The current numbers of loaded and unloaded heavy vehicle trips are summarised in Table 2.6. The current weekday traffic counts indicates that 234 heavy vehicles using the full length of Gocup Road in 2006. This analysis suggests that Visy, Weyerhaeuser and Carter Holt Harvey account for 89 (or 38%) of the number of weekday heavy vehicles. This percentage includes back-loading as general freight i.e. not by the timber company.

Table 2.6: Current combined effects of Visy, Weyerhaeuser and Carter Holt Harvey

Company	No of Loaded HV per day		No of Unloaded HV per day	
	Tumut to Gundagai	Gundagai to Tumut	Tumut to Gundagai	Gundagai to Tumut
Visy	6	17	11	0
Weyerhaeuser	20	7	2	15
Carter Holt Harvey	3	3	3	2
Total (89)	29	27	16	17

The combined effect of Visy, Weyerhaeuser and Carter Holt Harvey following the implementation of Stage 2 by Visy will be to increase the number of loaded heavy vehicles on a weekday by 51 vehicles per day between Tumut and Gundagai and 80 vehicles per day in the opposite direction. In addition to the loaded trucks there will be an additional 36 trucks returning unloaded from Tumut to Gundagai. The estimates are summarised in Table 2.7.

Table 2.7: Future combined effects of Visy, Weyerhaeuser and Carter Holt Harvey

Company	No of Loaded HV per day		No of Unloaded HV per day	
	Tumut to Gundagai	Gundagai to Tumut	Tumut to Gundagai	Gundagai to Tumut
Visy	55	96	47	0
Weyerhaeuser	22	8	3	16
Carter Holt Harvey	3	3	3	2
Total (257)	80	107	52	18
Increase (168)	51	80	36	1

Based on the forecast increase in the transport task for the three companies, the number of heavy vehicles using the Gocup Road on a weekday will increase from 234 to 402 heavy vehicles per day. This represents an increase of 168 heavy vehicles per day, 131 of which will be fully loaded.

The existing Gocup Road is barely adequate for the existing heavy traffic volumes but will become a significant road safety risk during the working week when the number of heavy vehicles increases by 70% each day.

3. THE INFRASTRUCTURE PLAN

Two standards are considered in this report. The first involves upgrading the Gocup Road to a 3-lane standard for the entire length of the road. This would facilitate the separation of heavy and light vehicles and significantly improve the traffic flow over the route.

The other standard is a low cost solution aimed at improving road safety by widening the entire length to a minimum 2-lane road standard and overtaking lanes at five critical locations. This standard would provide a safe travelling standard for minimum cost but would invariably result in some delays for light vehicles along the route.

The following design cross section was adopted for estimating purposes:

- 2 x 3.5m wide traffic lanes (3 x 3.5m in the case of the 3 lane standard)
- 2m wide shoulders each side, sealed for 1m

In addition, the minimum allowable length of “W” beam guardrail was 28m and was applicable at culverts and other similar obstacles.

Pavement construction requirements were based on both field measurements and from road segment data provided by the Councils. There was some variability in the standard of the existing shoulder construction and it was assumed that where pavement widening to provide either traffic lanes or shoulders was required, all pavements beyond the edge of the existing seal would require new base-course construction.

Due to the high proportion of heavy vehicles, the pavement design consisted of 250mm thick sub-base and 150mm base-course. There are also lengths of pavement that would need rehabilitation as part of the roadwork. The estimate was based on reworking and stabilising the existing material.

3.1 Capital Works for Three Lane Standard

Two approaches to a three lane standard were considered. The first was to build the additional lane on the existing road without altering the vertical or horizontal alignment. This would involve alternating the third lane between northbound and southbound traffic.

The estimated cost for this construction is \$48.8 million. However, this is considered an unsafe solution as the extra lane would only encourage motorists to increase their speed on an alignment that was not suitable. The merging of the faster motorists and the heavy vehicles would soon become black spots on the road.

The other approach was to build the third lane but improve the alignment where safety was a concern. This would involve major construction over most of the length requiring some acquisition in certain parts. Although a detailed estimate has not been prepared, the estimated cost is likely to be of the order of \$3.0 million per km. As the entire length of the route would require upgrading, this would cost of the order of \$90 million.

3.2 Capital Works for Low Cost Standard

An estimated \$24.56 million is required to upgrade the Gocup Road to the 2-lane rural road standard with overtaking opportunities at five locations. Two overtaking lanes are proposed for the Tumut Council section and three for the Gundagai Council section. The estimate includes the rehabilitation of 5.4 km over the length of the road.

The estimates also allow for 15% of construction costs for traffic management and 6% for engineering overheads, such as project management. The estimates are based on current 2006 dollars.

The breakdown of the estimate by work type and Council is given in Tables 3.1 and 3.2, with further details in the Appendix.

Table 3.1: Capital Works Estimate

Work Type	Description of Works	Cost, \$
Road Widening and Overtaking Lanes	Reconstruct, widen and rehabilitate between Snowy Mountains Highway and Tumut / Gundagai Shire Boundary	\$7,236,478
	Reconstruct, widen and rehabilitate between Tumut / Gundagai Shire Boundary and Mount Street, South Gundagai	\$12,502,825
	Total	\$19,739,304
Intersections	Major construction of a roundabout at intersection with the Snowy Mountains Highway at Tumut	\$2,000,000
	Upgrade intersection with six local access roads in Tumut section	\$438,840
	Upgrade intersection in Mount Street, South Gundagai and connection to the Hume Highway	\$385,204
	Total	\$2,824,044
Bridgeworks	Replace Gilmore Creek Bridge, north of Tumut	\$609,500
	Total	\$609,500
Miscellaneous	Construct school bus pull off areas	\$365,700
	Relocation of utilities	\$318,000
	Survey and design	\$700,000
	Land acquisition	\$0
	Total	\$1,383,700
Total		\$24,556,548

Table 3.2: Capital Works Estimate by Council

Council	Cost, \$	%
Tumut	\$10,860,002	44%
Gundagai	\$13,696,546	56%
Total	\$24,556,548	

3.3 Low Cost Standard Contract Packages

The capital works for the low costs standard are grouped into seven construction contract packages and two miscellaneous packages, as shown in Table 3.3.

Table 3.3: Capital Works Packages

Package	Description of Works	Cost, \$
Tumut A	Construct roundabout at intersection with the Snowy Mountains Highway at Tumut	\$2,000,000
Tumut B	Reconstruct, widen and rehabilitate between Snowy Mountains Highway and 10.46km north of Tumut including Gilmore Creek bridge, an overtaking lane in the northbound lane at 6.2 km north of Tumut and another in the southbound lane at 9.8km, upgraded intersections to local access roads and school bus pull off areas	\$4,805,487
Tumut C	Reconstruct, widen and rehabilitate between 8.6km north of Tumut and the Tumut / Gundagai Shire Boundary including upgraded intersections to local access roads and school bus pull off areas	\$3,662,182
	Total	\$10,467,668
Gundagai A	Reconstruct, widen and rehabilitate between the Tumut / Gundagai Shire Boundary and 19km north of Tumut including an overtaking lane on the northbound lane at 17km and school bus pull off areas	\$3,483,989
Gundagai B	Reconstruct, widen and rehabilitate between 19km and 22km north of Tumut including an overtaking lane on the southbound lane at 20km and school bus pull off areas	\$4,071,622
Gundagai C	Reconstruct, widen and rehabilitate between 22km and 26.2km north of Tumut including an overtaking lane on the northbound lane at 25km and school bus pull off areas	\$4,271,667
Gundagai D	Reconstruct, widen and rehabilitate between 26.2km and the Hume Highway including upgrading the intersection at Mount Street and school bus pull off areas	\$1,243,600
	Total	\$13,070,879
Miscellaneous A	Relocation of utilities	\$318,000
Miscellaneous B	Survey and design	\$700,000
	Total	\$1,018,000
Total		\$24,556,548

3.4 Low Cost Standard Program

A program for the Gocup Road to be upgraded to the low cost standard over five years is shown in Figure 3.1.

The program is based on the assumption that most of the work will be undertaken by the construction units of Tumut and Gundagai Councils. Tumut Council would undertake contract packages Tumut B, Tumut C and Gundagai A consecutively, whilst Gundagai would undertake contract packages Gundagai B, Gundagai C and Gundagai D consecutively. Package Tumut A (construction of a major roundabout) may be suitable for an external contract.

Figure 3.1: Capital Works Program

Package	Pre-Year 1	Year 1	Year 2	Year 3	Year 4	Year 5
Miscellaneous A						
Miscellaneous B						
Tumut A						
Tumut B						
Tumut C						
Gundagai A						
Gundagai B						
Gundagai C						
Gundagai D						

3.5 Maintenance

Annualised maintenance expenditure has been estimated on the following assumptions:

- Routine maintenance is conducted 1.5 times per annum at a cost of \$2 / centreline metre / maintenance visit.
- The gravelled part of the shoulders are regraded and rolled every 2 years at a cost of \$0.35 / centreline metre.
- Sealed pavement is bitumen enriched 10 years after the last seal at a cost of \$1/m². This is proposed on the basis that it should allow the reseal interval to be pushed out to 15 years, even with the heavy traffic loading.
- Pavement reseals occur at 15 year intervals at a cost of \$5 / m².

On this basis the annualised maintenance cost per kilometre is \$7,429 per annum in 2006 dollars. Table 4.4 outlines the maintenance allocation needed once the infrastructure plan has been implemented.

Table 3.4: Maintenance Costs

Class	Per km per annum	Per annum
Routine maintenance	\$3,334	\$100,346
Specific maintenance	\$4,095	\$123,260
Total	\$7,429	\$223,605

4. RESEARCH AND CONSULTATION

The major stakeholders who were consulted in the course of the preparation of this report were:

- Tumut Shire Council;
- Gundagai Shire Council;
- Visy Pulp and Paper Pty Limited;
- Weyerhaeuser Australia;
- Carter Holt Harvey.

In addition reference was made to the following reports.

1. Profile of the Value of the Timber Industry in the South West Slopes Region of New South Wales, prepared by URS for the Riverina Regional Development Board, July 2004
2. Regional Transport Plan for the Timber Industry in the South West Slopes of NSW, prepared by PEECE Consulting for the Softwoods Working Group, April 2006
3. Submission to the Road Classification Review Panel on Main Road 279 – Gocup Road, prepared by Tumut and Gundagai Shire Councils, 2005

APPENDIX – DETAILS OF COST ESTIMATE

Roadwork Spreadsheet (excludes traffic management and overheads)

GOCUP ROAD SURVEY (MR279)				Unit Rates								
Date of Survey: 11-12/10/2006				\$40	\$60	\$140	\$10	\$10	\$140	\$15,000	\$200,000	
				ESTIMATES								
Chainage	Length_m	Works Required Left	Works Required Right	Bulk Earthworks	Fiddly Earthworks	DGB20 Pavement	Bitumen Seal	Stabilise Pavement	Guardrail	Widen Small Culvert	Widen Large Culvert	Total
0-1.2	0.2 0.3 creek	1200 shoulder widening lengthen 450 culvert 2.5metres lengthen 950 culvert 3.6 metres	shoulder widening	\$48,000		\$282,240	\$26,400					\$356,640
										\$30,000		\$30,000
										\$30,000		\$0
1.25-1.50	250		shoulder widening (some fill)	\$60,000		\$58,800	\$5,500					\$124,300
5.6-5.8	200	shoulder construction	shoulder reconstruction		\$36,000	\$44,800	\$3,800					\$84,600
6.1-6.4	300	shoulder construction	shoulder construction	\$12,000		\$67,200	\$5,700					\$84,900
	6.2	lengthen 600 culvert 2.5 metres	Lengthen 600 culvert 2.5 metres							\$30,000		\$30,000
6.15-7.05	1000	Construct passing lane		\$140,000		\$196,000	\$35,000					\$371,000
6.7 - 7.25	550	shoulder construction lengthen 3x375 by 2.5 metres guard rail at culvert	shoulder construction lengthen 3x375 by 2.5 metres guard rail at culvert	\$22,000		\$123,200	\$10,450		\$7,840	\$30,000		\$155,650
	6.7 6.8	shoulder construction cut average 3 metres high for 2500 metres	guard rail at culvert						\$7,840			\$7,840
8.1 - 8.65	550	fill for 100metres	shoulder construction	\$22,000	\$189,000	\$132,440	\$12,650					\$356,090
8.25-8.85	800	shoulder construction cut average 3 metres high for 2500 metres	Construct passing lane	\$112,000		\$156,800	\$28,000					\$296,800
8.85 - 10.46	1610	fill for 100metres extend 2/2.4x1.8 box culverts 2.5 metres	shoulder construction extend 2/2.4x1.8 box culverts 2.5 metres	\$64,400	\$189,000	\$414,736	\$41,860					\$709,996
	9.1	shoulder construction cut average 3 metres high for 500 metres							\$8,960	\$420,000		\$428,960
10.46 - 11.25	790	fill for 200metres	shoulder construction	\$283,600		\$185,808	\$17,380		\$28,000			\$514,788
11.25 - 11.5	250	widen shoulder 1 metre guard rail at culvert	widen shoulder 1 metre guard rail at culvert			\$58,800	\$5,500		\$7,840			\$64,300
	11.3								\$7,840			\$7,840
11.5 - 13.2	700	Construct shoulder	Construct shoulder	\$68,000		\$409,360	\$39,100					\$516,460
13.2 - 15.6	2400	Construct shoulder guard rail at culvert (large)	Construct shoulder guard rail at culvert (large)	\$56,000		\$290,080	\$28,900		\$8,960			\$374,980
	11.9 12.5	Cut for 50 metres	Cut for 50 metres		\$36,000				\$8,960			\$8,960
	12.8 - 12.9	100	Construct guard rail						\$14,000			\$14,000
	13.8	Extend 2x600 culverts 2.5 metres + guard rail	Extend 2x600 culverts 2.5 metres + guard rail						\$7,840	\$48,000		\$55,840
13.9 - 14.2	300	Cut left hand side		\$12,000	\$108,000	\$62,160	\$5,100					\$187,260
14.2		Construct guard rail at culvert	Construct guard rail at culvert						\$7,840			\$7,840
14.7 - 14.9	200	Extend 2x600 culverts 2.5 metres + guard rail	Extend 2x600 culverts 2.5 metres + guard rail						\$28,000			\$28,000
	14.9	Extend 3/1.2x1.2 box culverts 2.5 m + guard rail	Extend 3/1.2x1.2 box culverts 2.5 m + guard rail						\$7,840	\$48,000		\$55,840
	15.25 15.3	Guard rail at culvert	Guard rail at culvert						\$8,960	\$30,000		\$38,960
16.2 - 16.5	300	widen shoulder 1.5 metre	Widen shoulder 1.5 metres			\$67,200	\$6,000		\$7,840			\$73,200
0-16.4	2926	Shire Boundary	Pavement rehabilitation			\$430,081	\$204,800	\$204,800				\$839,682
	16.4										Total	\$5,936,406
16.4 - 16.5		Construct guard rail	Construct guard rail						\$28,000			\$28,000
16.5 - 16.7		Construct shoulder	Construct shoulder	\$16,000		\$117,600	\$4,400					\$138,000
16.7 - 18	1400	Construct climbing lane	Construct shoulder	\$1,120,000		\$1,313,200	\$79,800		\$42,000			\$2,555,000
18 - 19.9		Construct shoulder	Construct shoulder	\$304,000		\$446,880	\$41,800					\$792,680
	18-18.3	Construct guard rail	Construct guard rail						\$84,000			\$84,000
	18.5	Extend 2x 1.5m culverts + guard rail	Extend 2x 1.5m culverts + guard rail						\$7,840	\$400,000		\$407,840
19.2 - 19.4		Construct guard rail (high embankment av 2.5 m)	construct guard rail (high embankment av 2.5 m)		\$180,000				\$56,000			\$236,000
19.9 - 20.9	1100	Construct shoulder	Construct climbing lane + Guard rail	\$792,000	\$132,000	\$338,800	\$38,500		\$154,000			\$1,455,300
20.9- 21.7		Widen shoulder 1 metre cut LHS to fill RHS	Widen shoulder 1 metre cut LHS to fill RHS			\$89,600						\$89,600
21.7-22		Widen shoulder 1 metre cut LHS to fill RHS	Widen shoulder 1 metre cut LHS to fill RHS			\$33,600						\$33,600
23.2 - 23.4		Construct guard rail	Construct guard rail						\$32,200			\$32,200
23.4 - 23.7	25	Construct shoulder	Construct shoulder		\$18,000	\$68,880	\$6,300					\$93,180
		Construct climbing lane (heavy earthworks)										\$0
25 - 26.1	1200	Extend culvert (est 900) cutting (rock 4 m high)	Construct shoulder	\$1,182,720	\$528,000	\$692,160	\$75,600		\$168,000			\$2,646,480
	25.8 26 - 26.2		cutting (rock 4 m high) widen shoulder 1 metre (allow 200 metres guardrail)		\$320,000					\$60,000		\$60,000
26.1 - 26.6		widen shoulder 1 metre		\$40,000		\$107,520	\$6,000		\$28,000			\$181,520
26.6 - 27.2		Construct shoulder	Construct shoulder	\$48,000		\$89,600	\$7,200					\$144,800
27.2 - 28.7		Construct shoulder	Construct shoulder	\$40,000		\$114,800	\$10,500					\$165,300
	27.4 - 27.6		Construct guardrail						\$28,000			\$28,000
	27.6	Construct guard rail at culvert							\$7,840			\$7,840
	27.9 - 28. 2		Construct guard rail						\$42,000			\$42,000
	28.5											\$0
30.1						\$366,365	\$174,460	\$174,460				\$715,284
16.4-30.1	2492		Pavement rehabilitation									\$715,284
											Total	\$10,256,624
				\$4,442,720	\$1,736,000	\$6,758,710	\$920,700	\$379,260	\$829,640	\$246,000	\$880,000	\$16,193,030

Estimate Components

Type of Works	Location	Amount	Comments
Roadwork (see above)	Tumut Shire	\$5,936,406	Excluding traffic management and overheads
	Gundagai Shire	\$10,256,624	
Intersections	Snowy Mtns Hway	\$2,000,000	Estimate by- Tumut Shire and includes traffic management and overheads
	Link to SH2	\$216,000	300mx12m pavement rehabilitation - Gundagai Shire
	Gundagai	\$100,000	Intersection at Mount Street - Gundagai Shire
	Tumut Shire	\$360,000	6 access intersections in Tumut Shire @ \$60,000 each
Bridgeworks	Gilmore Creek	\$500,000	Outskirts of Tumut
School bus areas		\$300,000	Roadwork costs
Traffic management		15%	Percentage of construction costs
Utilities		\$300,000	Shared equally between both Councils
Overheads		6.00%	Percentage of construction costs
Pre-construction	Survey & design	\$700,000	
	land acquisition	\$0	
	Total	\$24,556,548	