Professional Engineering Service Pty Ltd
ACN 057 663 897

TIMBER Industry Haulage Study for the South West Slopes of New South Wales

2009 update of 2001 Study for Softwoods Working Group

December 2009

Softwoods Working Group associated road authorities:

RTA, Gundagai, Greater Hume, Tumbarumba and Tumut Shire Councils and Forests NSW

Table of Contents

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Study Methodology

This report has been prepared by Professional Engineering Service Pty Ltd based on previous iterations of analysis of the study area and information provided by road authorities, forest producers and timber processors. It was informed by existing data, analyses and reports, meetings and interviews with stakeholder representatives, specific forest production and processing and road infrastructure detail provided by stakeholders and analysis of road use and needs. This report presents road characteristic assessments and roadworks needs evaluations developed from the road control authorities strategic planning programs provided by their professional staff, compiled and adjusted by PES to provide uniform treatment.

References

***Timber Industry Haulage Study For the South West Slopes of NSW*, June 1990, and 1995, 1997 and 2001 revisions.**

***Engineering Assessment of Gocup Road between Tumut and Gundagai* 2008**

***Draft Discussion Paper, Upgrade of Coppabella Road* 2009**

SEATS Strategic Plan 2009

EXECUTIVE SUMMARY

This report has been prepared for the Softwoods Working Group (SWG) and is an updated version of similar reports that were prepared in 1990, 1995, 1997 and 2001.

The SWG was formed in 1987 and is administered under the auspices of *Regional Development Australia - Murray* (formerly the *Murray Regional Development Board)*.

The group consists of senior representatives from Local Government, Industry and Investment NSW, Regional Development Associations, State Forests of NSW and all the major plantation growing and processing industries in the south west slopes region of NSW.

Recognising the importance of a co-operative and co-ordinated approach, the SWG was originally formed to plan for the future needs of the essential road network as the local timber industry continued to grow.

The need for the 2009 Study has been based on the significant increases in timber-industry traffic volumes that have occurred since 2001 and the anticipated increases that will occur over the next 5-10 years.

The softwood plantation industry within the study area currently generates in excess of 6 million tonnes of raw materials and finished products per year which are conservatively estimated to be worth over $800 million.

It has been determined that approximately $18 million /annum is required to both upgrade and maintain the primary road network within this vital part of the plantation area of NSW.

This amount consists of:

$11.1M for essential primary network improvements including pavement strengthening
$ 2.0M for annual restoration of failed pavements (patching)
$ 5.1M for routine maintenance

The highest current priority for funding for improvements to allow the road infrastructure to carry its increasing load is the Gocup Road.

Given the extent and importance of the plantation industry to the local, state and national economies, the proposed works program represents a very sound investment in essential roading infrastructure.

1. INTRODUCTION

In January 2001 a submission was made to the Hon John Anderson MP, Deputy Prime Minister, Minister for Transport & Regional Services and Leader of the National Party by Gundagai, (then) Holbrook, Tumbarumba & Tumut Shire Councils in NSW, Towong Shire Council in Victoria & The Softwoods Working Group on behalf of the softwood timber industry seeking the classification of the timber haulage route from Gundagai-Tumut-Tumbarumba-Jingellic-Shelley as a road of national importance.

The submission called on the Minister:

1. **To acknowledge the importance of the softwood timber industry to Australia in terms of import replacement, and to recognise that the road from Gundagai in NSW to Shelley in Victoria, is a road of national importance.**
2. **To provide funding of $15 million per year for 10 years to enable this road to be reconstructed to meet current and future transport needs.**

Despite numerous representations to State and Federal Ministers of Parliament, there has been no long term funding commitment made to this network.

Auslink funding (in 2006-07) provided for upgrades and improvements to sections of the network which were not considered 'top priority'.

This report deals with the primary network of roads that services the timber industry of the south west slopes of NSW and includes incoming raw product from Shelley in Victoria. The recommended road of **national importance** forms the backbone of that primary network. Links into significant forest areas that carry very large timber haulage volumes are included in the primary network. Appendix A shows this primary network. Supplementary roads that have been identified previously as being important arterial roads servicing the timber industry are also identified in Appendix A but are not analysed in detail in this report.

This report is developed from the broader analysis of roads supporting the timber industry in the 1990, the Timber Industry Haulage Study for the South West Slopes of New South Wales and its review of October 1993, updates in December 1995, July 1997, the 1998 review (that embraced the significant changes to road cartage resulting from the Visy development at Tumut) and the September 2001 report update.

The area under study spans from north of Gundagai to the Upper Murray area in North East Victoria. The study shows current and future product movements and highlights the necessity for all levels of government and industry to expeditiously address the deficiencies in the road network so that it remains available and is able to provide for efficient transport of logs, sawmill chips, residues and finished timber and paper products

The earlier versions of this study proposed five year plans dealing with the then most critical network needs. There has been a generally positive reaction and many of the critical needs have been addressed – with combinations of government, grower and industry funding through stumpage levies and direct contributions to roadworks. Since the 2001 report there has been significant industry growth and there is projected ongoing growth in production and processing. There has also been a major change in road use needs. With the commissioning of Visy Stage 2, traffic volumes on Gocup Road are starting to increase markedly making this road the most critical in terms of upgrade and maintenance requirements.

The objective of this report is to:

1. **Outline current industry planning and expected developments**
2. **Review quantities hauled on the primary network**
3. **Describe the standard and condition of the primary network**
4. **Identify and quantify roadworks funding requirements on the primary network. (There is also a need to fund road management works on supplementary roads)**
5. **Demonstrate the economic benefits of preservation and development of the road network**
6. **Provide a framework for road authorities to set priorities and coordinate operations.**

The report comments on status of works recommended in the January 2001 update and a fresh analysis of needs for funding of $16 million per year for the 5 years of the study to enable the primary network (focussing on the backbone route) to be established and maintained to meet current and future transport needs and roadworks needs of other roads forming the primary network providing access to forests. There is also the anticipation of continuing need at the same level of funding at locations that will need periodic reassessment.

2. SOUTH WEST SLOPES TIMBER INDUSTRY

Forestry in the South West Slopes of NSW centres about the Tumut and Tumbarumba Districts. The timber industry processing and transport infrastructure in the South West Slopes also caters for a significant quantity of raw product from the Shelley Forest in North East Victoria. The South West Slopes of NSW and North East Victoria have the largest softwood plantations and this is now the largest softwood producing area in Australia.

Approximately 38 per cent of the people in the region, between Gundagai and Albury and the Snowy Mountains, depend upon the timber industry for their livelihoods.

The region has two pulp and paper mills (3 paper machines), including the new state-of-the-art Visy mill at Tumut. These mills will have the capacity to produce around 1 million tonnes of newsprint and paper product per year.

There are also four sawmills, two panel board plants, one plywood factory and two timber treatment plants located in or supplied from the region. These facilities are producing approximately 1.45 million tonnes of finished timber products.

This report updates the description of the history of industry development, the existing road network, and quantifies the road preservation, restoration and improvement works required to service the increasing transport needs of this expanding industry. Recent funding has targeted sections with deficiencies in condition (roughness), pavement strength and width.

Unique region

This region is unique to Australia in that timber is grown, harvested and processed locally, to its highest value added form: products from this region, being value added locally, are especially significant to Australia's balance of payments.

The South West Slopes Region of NSW currently produces 1.6 million tonnes of softwood sawlogs and 1 million tonnes of pulpwood annually with a further 240 000 tonnes produced in Northern Victoria's Upper Murray. With additional maturing plantations and the Visy Mill coming into full production the total tonnage of softwood log and product haulage has grown to approximately 4.4 million tonnes by 2010.

Forest ownership is mixed. Currently, and up to at least 2020, the region's supply from plantations will be very stable. The total plantation areas managed by Forests NSW is decreasing slightly, however it is balanced by growth in private plantations. There is also a significant volume of pulp logs being transported to the Visy Mill at Tumut from the Macquarie (Bathurst) and Monaro (Bombala) regions.

Transport needs

The road network to date has evolved from roads originally provided to service disparate agricultural production including small scale forestry, into a recognised primary network and feeder road system, as a reaction to increasing timber production. There is a now a need to construct a road system, and in particular a primary network, which meets both the current, and future, transport demands of the industry. The most significant component of the primary network is the backbone route that is proposed as a road of national importance.

This increased and increasing transport demand is a consequence of the Commonwealth Softwood Forestry Agreements of 1967 and 1972 which were discontinued in 1977. About 30 000 hectares were planted in the period. Yet, there has been no Commonwealth or State funding to build the appropriate road network to cater for the resulting heavy loading on the roads.

This lack of specific road development funding is contrasted by the benefits coming from the industry in this region which contributes approximately $1 billion in import replacement value on the Australian domestic market, which is estimated to rise to around $1.5 billion by 2020.

The key transportation route (Backbone Route) for forest products in this region is from the Hume Highway at Gundagai to Tumut to Tumbarumba, crossing the border into Victoria at Jingellic and to Shelley on the Murray Valley Highway. The remainder of the primary network has been identified as those roads that provide a trunk transport function and carry very heavy loading. The Primary Network including the Backbone Route is shown on the map in Appendix A.

Other major beneficiaries

Horticulture and tourism would also be major beneficiaries of any work that is done on this strategic road network that accesses major tourism venues and attractions on the Western Side of the Great Dividing Range.

The primary network roads are of vital importance to the growing of cool climate wines, apple and stone fruit markets, with current production more than $100 million per annum. This combined with the existing traditional grazing and wool production of more than $150 million per annum provides a substantial argument for road reconstruction to reduce transport costs.

Environmental benefits

Softwood plantations make a major contribution to reduction of atmospheric carbon, improve water quality, lower water tables and decrease salinity, and enhance biodiversity.

Road network improvements promote plantation investment, accelerate positive environmental attributes and aid commercial returns.

The majority of the plantations are independently certified to international forestry standards.

Forests and plantations

The majority of softwood forests are currently State-owned and managed by *Forests NSW* but the area of private softwoods forests is substantial and is likely to increase as a proportion of the total. There is also significant hardwood production in the region, with relatively static volume. Volume of softwood production is increasing rapidly as large areas of plantations mature.

The map in Appendix A shows current plantation locations and indicates ownership.

Plantation production will mirror industry processing over the next ten years with a mix of materials sourced from Forests NSW and private plantations and a small proportion inputted from outside the region.

Appendix C shows Timber supply assumptions in the context of its destination processing locations. It shows annual cartage in the region approaching 5.9 million tonnes.

Recent timber processing developments

Visy Pulp and Paper Pty Limited (Visy) has established a kraft pulpmill near Tumut that has an intake of around 600,000 tonnes of pulplogs and 350,000 tonnes of sawmill residue (Woodchips) annually.

In 2008 Visy commenced construction of the second paper machine which was commissioned in Oct 2009. This will result in their annual intake of pulplogs increasing to around 1.5 million tonnes per year with sawmill chips up to 650,000 tonnes by 2012. The majority of pulplog supplies will come from the plantations of FNSW. Significant other volumes will be sourced from the Macquarie, Braidwood, ACT and Monaro regions.

The Visy development also provides a secure market for sawmill residues (woodchips) and promotes a very positive investment climate for sawlog based industry.

The Timber Supply Agreement between Visy and Forests NSW requires additional plantings of 20,000 ha (FNSW) and 10,000 ha (Visy) by 2014. While more than half of these plantations have now been established, it will be at least 5 years before product from these additional plantings impact on haulage.

The Norske Skog newsprint mill at Albury will provide relatively static demand for pulplogs at 130,000 tonnes annually from State Forests, 60,000 tonnes annually from Hancock Victorian Plantations (HVP) which are carried on highways only, 150,000 tonnes annually from Murrray River and Hume forests, 30,000 tonnes from private plantations and 40,000 tonnes of smallchips from Victoria.

The Hyne sawmill at Tumbarumba has been redeveloped and has incorporated the former Austral operation based at Holbrook. This world-class facility has the potential to utilise 1 million tonnes sawlogs per year.

Further growth of the CHH and Hyne sawmills in Tumut and Tumbarumba is expected over the coming decade.

3. ANALYSIS OF PRIMARY ROAD NETWORK

The south west slopes forests are situated on the western slopes of the Great Dividing Range, where the rainfall is relatively high. The Tumut plantations are in the upper catchment area of the Murrumbidgee River, and the Tumbarumba plantations are in the upper catchment areas of the Murrumbidgee and Murray Rivers.

The road network servicing these areas crosses the mountainous areas between the two catchments, and because of the topography and climate the roads are relatively expensive to construct and maintain. Heavy snow and ice and summer drought are features of the climate.

Existing Road Network

The road network that was constructed in the early 1950s was developed to provide local access and to service low density grazing and relatively small volume hardwood logging. Significant sections have been improved with funding specifically allocated to developing the network for forest access and timber processing needs since the strategic importance was highlighted in the initial (1990) study. Pavements remaining are generally in excess of 40 years old, and were constructed for much lower axle loads and volumes, typically with a design life of 20 years.

Loading changes

The road network carrying forest products is aging and the older pavements are carrying loads in excess of their original design capacities. Conventional log haulage trucks in the 1940s and 1950s were rigid 12-tonne capacity. Trucks now range up to 42.5 tonne for standard semi trailers, 47 tonne for overload permitted semi-trailers and 64.5 tonne for B-doubles with mass management. Cartage by the industry employs a broad variety of truck configurations with up to 42 tonne payloads. The network's condition is now generally poor, and rapidly deteriorating, illustrating that it is not coping adequately with the existing haulage volumes which are less than the volumes that will result from the projected increased forest outputs.

The introduction of permitted heavier loading for vehicles has served to accelerate the deterioration of already overstressed road pavements. The increased weights permitted has increased the equivalent axle loading per unit weight carried by approximately 35% resulting in an increase in the required design pavement thickness (and cost) for new works. Use of B-Doubles rather than conventional semi-trailers does however reduce the total axle loading per unit of freight, minimising the overall increase.

Timber processing industries now have the capacity to and provide the best economic return by operating continuously 24 hours a day, 7 days a week throughout the year. This generates demand for year round haulage. Historically, logging equipment could only work in dry times - wet conditions bogged the plant. Now the plant can work in all seasons. Haulage of small quantities over low standard roads in wet conditions will have significant adverse effects.

Asset Management History

The first edition of this study focussed on the need to strengthen weak pavements that were particularly susceptible to heavy vehicle loading in wet typically winter periods. The 1990 study and subsequent reviews proposed five year plans dealing with the then most critical network needs which included locations with poor safety (hazard) features and others with insufficient capacity to carry the projected loads and volumes.

Since the first publication of the Road haulage Study in 1990 funding of works on roads used for log haulage has targeted problem areas and substantial improvements have been made to high priority sections – SR85 Laurel Hill to Tumbarumba, SR284 Little Billabong to RR384 intersection and SR85 Carboona Gap.

Government and industry have responded very positively to the need for road asset funding. For example:

- Specific grants through the RTA. Eg. An access road into the new Visy plant was constructed using NSW state funds.
- industry funding through stumpage levies paid by processors.
- Forests NSW has a program of developing and maintaining forest arterial roads and Shire roads providing access from the forests to the primary network. Forests NSW expends approximately $6M pa on roadworks in the region.
- Visy pays $20M pa for "harvesting and delivery", about half of which is for timber transport.

- Some links have been built or upgraded by major road users, eg Wondalga, Bombowlee Creek, Wee Jasper and Billapaloola Roads by Forests NSW, Broadleaf Park Road by ANM (now Norske Skog) and MR 284 under the then DMR programs. Boral Timber (now Hyne) at Tumbarumba provided a development contribution of $140,000 to SR 85 for the period 1991 to 1996.
- Councils allocate a high proportion of the grants they receive to roads carrying timber.

An ongoing and refreshed funding commitment is needed. Since the 2001 report there has been significant industry growth and there is projected ongoing growth in production and processing. (This is demonstrated in the figure in the Road Haulage Quantum clause)

As the importance of developing plantation areas and increases and disposition of product changes additional road links need to be considered or have their status reassessed. There has also been a major change in road use needs. RR331 and Coppabella Road are in this situation. Gocup Road (RR279) is the most impacted route, particularly since establishment of Visy Stage 2. Traffic volumes on Gocup Road have expanded hugely and it has become the most critical-need location.

Excessive burden

With larger axle load limits and the continued expansion of softwood plantations, illustrated by the enlarged Visy pulp and paper mill project (now completed), the factors of increasing total volumes, increasing unit loads and continuous activity will place an excessive burden on the road network .

Currently planned road funding cannot meet future loading levels because of accelerating tonnages throughout the network.

The road structures in the network servicing the industry are not adequate to cope with the existing and increasing haulage volumes projected from increased forest outputs and mill consumption. The most heavily trafficked routes, the preferred primary network, have recently been targeted for restoration works and condition has improved. However, much work still needs to be done. Other timber carrying roads are exhibiting extensive areas of serious cracking and rutting.

In addition to the need for upgrading the network there is a continuing need for the recurring maintenance activities. The costs of the various recurring activities vary according to the quality of the road and the traffic demand. For example:

Recurring Activity	Influence on Cost of Increase of Deficiency of the Following:				
	Increased Traffic	Deficient Pavement	Increased Age	Deficient Alignment	Deficient Width
Routine Maintenance	Increased Cost	Increased Cost	Increase not proportional	Indirect Increase	Increased Cost
Pothole Patching (more extreme on gravel pavements)	Increased Cost	Increased Cost	Large Increase	Not directly related	Indirect Increase
Resealing (not for gravel pavements)	Increase < proportional	Increase not proportional	More often, less effect	Indirect Increase	Not directly related
Resheeting Gravel Pavement	Increased Cost	Large Increase	Increased Cost	Increased Cost	Increased Cost
Shoulders, Edges (not for gravel pavements)	Increased Cost	Increased Cost	Indirect Increase	Increased Cost	Large Increase
Major Patching / Repair	Increased Cost	Increased Cost	Increased Cost	Indirect Increase	Not directly related

Edge maintenance and seal width on narrow sealed pavements is a safety issue as well as a capacity issue. A step develops off the edge of the seal which can easily induce a driver to lose control of the vehicle. This problem is escalated due to the likelihood that narrow seals occur on lesser funded roads with generally lower standard geometry.

Implications of Inadequate Funding

A flexible pavement is designed to carry the load assessed at its time of construction, normally for a term of 20 years. At the end of that period (or before if total traffic and/or unit weights increase) it is expected that pavement strengthening or reconstruction will be required. Much of the main and local road network has pavements in overloaded condition, showing distress and requiring progressive remedial works.

If structural loading of the pavement continues, major road failures are to be expected, with progressive loss of the existing road asset and growing interruption, delay and in some areas stoppage of timber industry, local and tourist transportation. If allowed to continue the shedding of traffic on to other roads would lead to the progressive decay of the whole road system.

Cost of Cartage along lower standard routes is higher than that on better quality roads. Average rates (as quoted in the Vicroads October 1994 Discussion Paper on Financing Options for Timber Roads) are shown below *with updating to $2008 (using CPI Australia Sept 1994 to Sept 2008).*

General Road Type	Average Rate ($/km/tonne)		Percentage relative to cost on high quality road
	$1994	$2008	
Highways, Main Roads	0.11	*0.16*	100
Sealed Roads with low standard geometry	0.14	*0.21*	127
Unsealed Public Roads	0.19	*0.28*	173
Unformed Tracks. Eg in forest areas	0.65	*0.97*	590

Serviceability of pavements can be sustained in the short term by regular maintenance, pothole patching and resealing to minimise water penetration.

Pothole patching and resealing do not provide pavement renewal or strengthening. Pavement reconstruction to a standard to suit current and forecast loading are necessary.

Plantations and Reafforestations Act 1999 Provisions

The provisions for Regional Contributions Plans under the Plantations and Reafforestations Act 1999 have not been effectively implemented to provide an income stream for roadworks.

However, private forest operators on the SW slopes are developing separate arrangements with road authorities and the government for shared funding of local roads accessing the plantations they operate.

The Act has undergone a public consultation period and contributions to this review have been submitted by both the SWG as a whole as well as individual member-organisations.

Primary Network and Backbone Route

This report only addresses Primary Network component of the arterial and collector roads carrying significant volumes of forest products. Other important roads servicing the industry are identified as supplementary roads, but not analysed in detail. The roads have been considered in sections as defined in Appendix A which includes a map of the roads and forest plantations.

Appendix B shows a spreadsheet detailing characteristics of each road link included in the analysis. The information presented for each road link includes:

- Link name and length
- Terrain, standard of road geometry and condition of the existing road structure
- General road use (AADT)

- Annual tonnages of forest product carted for sample years 2010 – 2015 and 2016 - 2020.

  The relationship between tonnages carted and Heavy loading on the pavements from timber cartage expressed in terms of equivalent standard axles (for anaylsis in pavement design) can be approximated by assuming a best case scenario with :

  - 62.5 tonne gross B-doubles with mass management with 40T payload (22.5T empty)
  - 6.34 ESA/vehicle loaded and 1.5 ESA/vehicle unloaded
  - Which ampproximates to 0.2 ESA per tonne hauled.

Appendix C shows the timber supply and road usage assumptions used to generate forecast haulage volumes.

Specific Situations

Regional Road 331

Jingellic Road *(according to Google Maps)* is Regional Road 331 running from State Road 85 south of Tumbarumba to Holbrook. RR331 carries raw product to mills near Tumbarumba and product to join the Hume Highway at Holbrook. Its use has grown hugely since 2001 and it is now identified as part of the Primary Network. RR331 is also an important regional road carrying a business, school, agricultural and school traffic mix. It has a relatively weak, aged pavement and narrow seal. The eastern end of the road has low standard geometry – particularly through Yarara Gap. The recommended works program in this report supports this road.

Gocup Road

Gocup Road is currently Regional Road 279 running between Tumut and Gundagai. It carries a high proportion of timber product from mills to the state highway system linking to Sydney. It is also an important regional road carrying a business, school, agricultural and school traffic mix. A separate assessment of Gocup Road was carried out in 2008 identifying its importance, serious deficiencies and upgrading needs. The recommended works program in this report supports this road as part of the backbone route.

The Snowy Mountains Highway is the alternative to using Gocup Road for transport to and from Tumut – however the route is 32 km longer and road characteristics, particularly around Adelong which has a curfew for Visy trucks, are not suited to additional heavy traffic. Simple (order of magnitude) economic assessment of additional user costs associated with using the longer route suggest:

164,000 Heavy Vehicles pa. (Tumut Shire projection)
Total travel distance: 5,250,000km
Associated time: 32km at average speed 60kph = 87,500hours pa.
Vehicle Operation Cost (VOC) at $1 /km = $5,250,000 pa.
Travel Time Cost (TTC) at $40 ph = $3,500,000 pa.

Ie total additional user cost for the alternative route is over $8.5M per year.

Coppabella Road

Coppabella Road is a local road within the Greater Hume Shire connecting 12,000Ha of plantation area to the Wagga Wagga-Tumbarumba Road – MR284. As such it is carrying a large volume of log traffic and will have even larger demands placed on it during this plan period. Consequently it is now identified as part of the Primary Network and on the priority list for future funding. A separate draft report was prepared that identified the extent and possible costs of works required and has been the basis for data in this study. A more comprehensive report is anticipated during the first quarter of 2010 that will provide more details on works required and budgeted costs.

Batlow Bypass

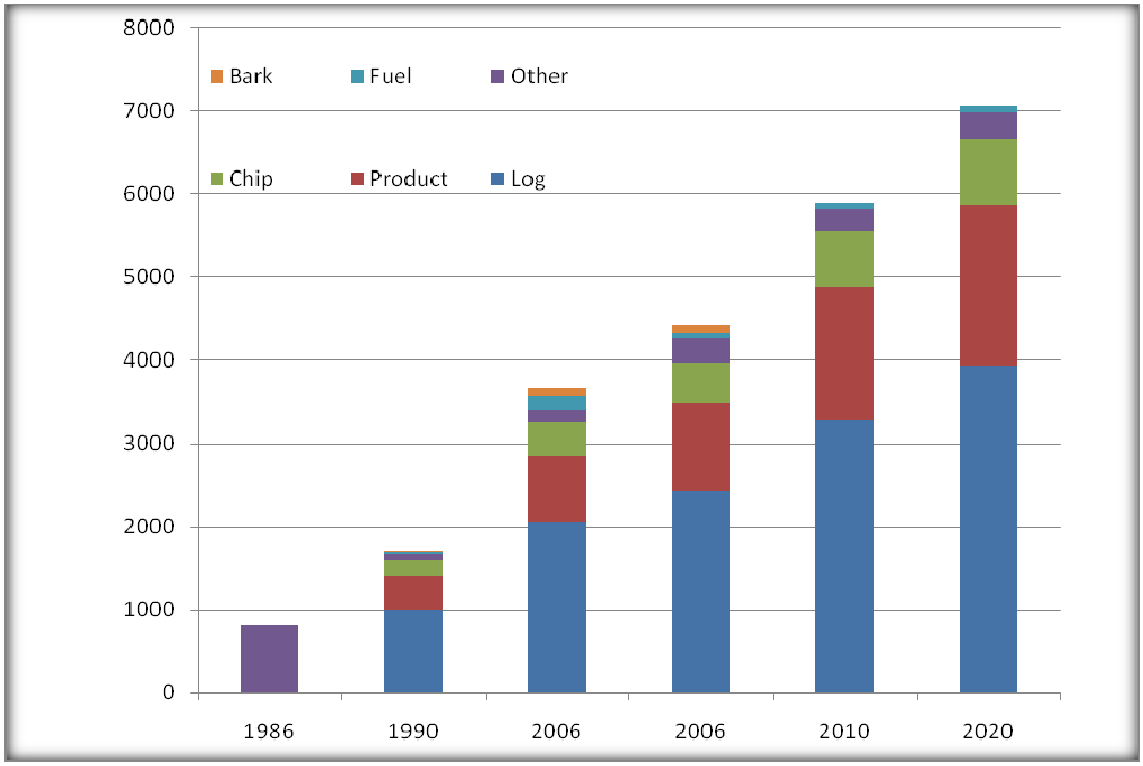
State Road 85 carries the backbone route through the township of Batlow. The timber haulage route is now partially bypassing Batlow using Lower Bago and Green Hills Access Roads. The recommended works program in this report supports the roads which form the backbone ro ute bypass of Batlow. Tumut Council will continue to investigate a viable Batlow by-pass option.

Courabyra Road - Tumbarumba Bypass

State Road 85 carries the backbone route through the township of Tumbarumba. Planning is continuing to develop a viable route to bypass Tumbarumba using Courabyra Road. The recommended works program in this report supports this proposal.

Road haulage quantum

Total Timber Industry Tonnes Carried on the Road Network



The step in cartage indicated in 2010 is due to the figures incorporating a wider range of materials – as the industry has become more environmentally aware there has been less wastage / an increase in row material usage (incl. innovations such as use of biomass in power generation) and increased recycling.

Road network management needs

Maintenance

Routine maintenance, pothole repair, heavy patching and resealing has not been considered in detail in this submission. These activities are programmed and carried out on a regular basis. Approximate costing for each link is included in Appendix E.

Upgrading

The need for upgrading of each road link has been derived taking into consideration the following factors:

- Volume of forest products to be carried over the section and the expected benefits from transport cost savings and safety improvement
- Existing condition (assessed from structural capability to carry the projected traffic loading), and the resulting cost of road failures if work is not undertaken
- Conflict with non-forest related traffic
- Possibility of alternate routes.

Appendix D describes road management planning with upgrading needs for each link.

Appendix E provides recommended works programs.

4. RECOMMENDATIONS

Summary

An efficient industry needs an efficient infrastructure. Investment in plantation growth leads to increased demand on the transport infrastructure. The Government's commitment to timber industries of additional softwood plantations is of little benefit if the timber cannot be cost effectively harvested and transported to the mills. A cost effective balance in provision of infrastructure improvement occurs when the benefits of reduced haulage costs equals the costs for road works.

The backbone of the softwood timber transport network is the Gundagai (NSW) to Shelley (Victoria) Route, which is approximately 170 kilometres long, and will need allocated funding of to bring it up to the standard necessary to meet the current and future demands of the industry. The the primary network needs a funding of **$18.2 million** per year over the 5 year period of this analysis aand anticipated ongiong funding at a similar level to provide a basic condition of road for access for the industry.

The backbone route is part of the "primary network" of roads that provide a trunk transport function and are very heavily loaded by timber industry transport.

The upgrade of this essential backbone to the softwood timber industry and properly planned maintenance and selected improvement of the primary network will deliver substantial benefits to the industry and the economy as a whole, making timber log haulage more cost effective, and consequently Australian timber more competitive in a global economy. ***Upgrading of the Gocup Road (Tumut to Gundagai) is the highest priority for all stakeholders***.

This submission recommends:

1. acknowledgement of the importance of the softwood timber industry to Australia in terms of import replacement and that recognition be given to the road from Shelley in Victoria to Gundagai in NSW (Backbone Route) as a road of National importance.
2. provision of funding of **$18.2 million** per year for the Primary Network to enable the roads to be reconstructed to meet current and future transport needs.

This report also seeks continued State support of roadworks on the Primary network as well as consistent planning of the management of that network.

Primary network

- All links on the primary network should be recognised for State Importance for funding of restoration and maintenance.
- The Backbone Route should be recognised for National and State Importance with appropriate funding.
- Timber traffic must be directed on to the designated network, and away from undeveloped alternatives.
- State Funds should be applied to the upgrading and maintenance needs of the primary network.
- Preventative maintenance should continue to be given priority in funding for State Roads. Funding of preventative maintenance on Regional Roads is more limited and level of funding needs to be pursued vigorously.
- A 10 year program of pavement strengthening and critical network improvement works be undertaken to eliminate the most critical road deficiencies on the primary network. Initially this would require an average allocation of:
  - **$11.1M** pa for Improvement works – to lift the network to a safe standard
  - **$2M** pa for Restoration of failing pavements – on a normal cycle expectation
  - **$5.1M pa** for Maintenance: routine patching, resealing and linemarking.

  Current network condition suggests that a higher than average funding boost is needed in early years.

The recommended program is presented as a cumulative "10 year" program. Given the current poor condition of the roads an early concentration of funding is warranted.

Planned outcome

Sections below current standard width, with pavement not capable of carrying loading, suffering seal degradation or with poor alignment will be treated.

The outcomes will be establishment of a consistent safe and efficient standard with an environmentally sound road environment requiring only routine maintenance.

Federal and State Context

With increasing truck mass limits negotiated by the Federal and State Governments, and the volume of traffic that uses these roads, the State Government and Local Councils are unable to keep pace with the damage that heavy haulage trucks do to the road.

The Softwoods Working Group has been successful to date, in formulating a strategy plan for timber log haulage, and to prioritise road works so that the timber can be harvested and processed in Australia. However, there is limited funding to enable this plan to keep pace with the deteriorating condition of the road network. At the same time substantial State and Federal funds have been directed to expand softwood plantations and to supplement industry development.

Need for Federal and State funding

The Softwoods Working Group believe it is time for the Federal and State Governments to recognise the importance of the industry, and in particular the timber haulage roads, to the national economy.

With the commissioning of the expanded Visy Mill at Tumut and the ongoing commitment to complete the establishment of an additional 30 000 hectares of softwood plantations in the region, the industry and local communities are suffering from an inadequate road network.

The backbone of the softwood timber industry is the road network and without good all-weather road access the industry would collapse.

In 1998 the State Government committed $6 million per year for management of the haulage network. This commitment will need to continue at a rate as proposed in this report. However without some recognition by the Federal Government of the need to fund the timber road infrastructure, its deterioration will ultimately jeopardise the future of the domestic softwood industry.

Significant benefits

The Softwoods Working Group recognises the potential for an upgrade of the backbone route and adequate management of the remainder of the primary network to deliver significant benefits to the industry and to the Australian people through increased and more cost-effective transportation of timber.

The industry must remain competitive in a global market, and to do so they must have access to competitive transport, and this is only possible if the roads are of a high standard.

Transport costs are an integral component of forest product pricing; dollars spent on building better haulage roads equate to lower overall costs.

Bypasses for town centres

- The primary network now by-passes the town centre of Tumut.
- The network may be further developed to avoid the town centre of Tumbarumba. Courabyra Road offers the opportunity of removing heavy north/south traffic from the developed parts of Tumbarumba. It is however seriously deficient in width and pavement strength and upgrading costs will be high. East/west traffic can also be diverted around the developed parts of Tumbarumba through its industrial area.
- An alternative route could be provided to bypass the town of Batlow. The route would require considerable route development planning and subsequent road upgrading.

Maintenance and Development Needs

The main enhanced funding need of the primary network, including the backbone route, is for specific improvements and preventative maintenance. The need for new development works is limited to isolated locations across the network. The mountainous terrain generally dictates the use of the existing network alignments as the most cost effective strategy.

Funding

- Funding of works on the State Roads network is based on objective needs across the State. The objective determination is based on asset measures.
- The majority of Regional Road funding is provided by formula that considers road length and traffic volumes.
- FAGS funding for local roads are based on LGA area road length and population.

Neither formula uses heavy traffic data and therefore do not address the proportionally higher loading on roads produced by the concentration of heavy timber transports. Preventative maintenance is still being deferred as most funds are allocated in response to need for immediate repair of failures.

The increased heavy traffic is and will continue to have a critical effect on the condition of the network roads, and maintenance funding should be increased accordingly.

Recent funding has been provided consistent with the reviewed and updated Timber Industry Haulage Study. Generally the funds for specific works have been provided from 3x3 and other State programs.

For funding under the REPAIR Program for Regional Roads Councils are required to provide 50% of total project cost (as a condition for REPAIR funds allocation). This is an issue for all regional roads, not just those carrying timber.

Appendix D provides discussion on the particular rehabilitation and upgrading projects proposed in this report to cater for the haulage demand.

The working party's recommended works program is presented in Appendix E. This program comprises treatment of critical sections for works strategies based on heavy patching and pavement strengthening with only a few feature improvement proposals including widening of narrow pavements and curve and intersection improvements.

Costs for the program strategies are averaged over a ten year period. However early application of greater than average funding is warranted to treat current significant deficiencies in the network.

The total project funding need recommended for the primary network including the backbone route is

$18.2M pa

The funding recommendation exceeds that provided in recent years, reflecting the impact of increasing loading.

Priorities for works are indicated by the recommended timing. Priority is based on the need for treatment due to current road characteristics, fitness for purpose of the proposal and the proposal's feasibility and justification (informed subjective assessment). The priorities are determined regardless of Local Government area boundaries or road manager.

Appendix E is expressed as total program and identifies projects under the management of the associated Local Government and other road authorities.

The works proposals for the cumulative 10 year program will need to be formally reassessed in about 5 years time.

APPENDICES

APPENDIX A	Log Haulage Routes: Map and Link Description
APPENDIX B	Existing Road Standard and Condition
APPENDIX C	Timber Supply and Road Usage Assumptions to Forecast Woodflow
APPENDIX D	Logging Road Upgrading Needs
APPENDIX E	Recommended Works Programs

APPENDIX A

Log Haulage Routes - South West Slopes Link Descriptions

Key

Map Reference:	A simplified map marking showing network category (backbone **B** or primary **P** with possible addition of secondary or supplementary **S**) and generally increasing from south (or source) to north (or destination). The dot suffix demonstrates varying road authority.	Classified Road Status:	NH for National Highway SH for State Highway SR for State Road RR for Regional Road LR for Local Road
Road Number:	Per the RTA road numbering system Local road name or road authority reference if one exists Field filler xx if no number exists	LGA or Authority:	The council managing the link Roads and Traffic Authority Forests NSW or any other applicable road manager

The legal system of classified roads is controlled under the *Roads Act 1993*, which divides classified roads into the following categories:

- Freeway
- State Highway
- Main Road
- Tourist Road
- Secondary Road

However, whilst this is the legal framework for classifying roads in New South Wales, management of the classified roads is done under a different system. The Roads Act 1993, which administers the Freeway, State Highway, Main Road, Tourist Road and Secondary Road classifications, does not specify funding or management arrangements for each classification. Instead, all classified roads are then categorised into three management categories:

- State Roads
- Regional Roads
- Local Roads

State Roads are the primary network of principal traffic carrying and linking routes for the movement of people and goods within the urban centres of Sydney, Newcastle, Wollongong and Central Coast, and throughout the State. These are the responsibility of the Roads and Traffic Authority (i.e. State Government) to fund, prioritise and carry out works. State Roads generally include those roads classified as Freeways, State Highways and Main Roads under the *Roads Act*, however there are a few exceptions (more about this later). Interestingly, the council remains the “owner” and “authority” for State Roads other than Freeways, and the RTA only exercises road authority functions to the extent necessary for the functioning of the road as a State Road (i.e. councils are responsible for the footpaths and road reserve, whilst the RTA is responsible for the pavement and structures).

Regional Roads comprise the secondary road network which, together with State Roads, provide for travel between smaller towns and districts and perform a sub-arterial function within major urban centres. These roads are the responsibility of councils (including determining priorities and carrying out works) but receive a block grant of funding from the State Government. This category generally includes those roads classified as Secondary Roads and many of the less significant Main Roads, plus many roads not classified under the Roads Act.

Local Roads comprise those roads not classified under the *Roads Act 1993* and some classified roads that now provide for only local access and communication. These roads are the responsibility of Local Government authorities with only limited funding assistance from the State Government and access to funding from the Federal Government block grant.

In the tabulation for this report roads are recognised in the local government area they fall into. State Roads, which are primarily the responsibility of RTA typically have their management under council control – with primary funding from the State.

Backbone Route

Map Reference	Classification	Management Category	Road Number	LGA or Authority	Additional Link Description
B1.1	Main Road	State Road	MR 85	Tumbarumba	Jingellic to Tumbarumba
B1.2	Main Road	State Road	MR 85	Tumbarumba	Jingellic to Tumbarumba
B2	Unclassified	Local Road	Courabyra Road	Tumbarumba	Tumbarumba Bypass
B3.1	Main Road	State Road	MR 85	Tumbarumba	Tumbarumba to Batlow
B3.2	Main Road	State Road	MR 85	Tumut	Tumbarumba to Batlow
B4	Unclassified	Local Road	TBA	Tumut	Batlow Bypass
B5.1	Main Road	State Road	MR 85	Tumut	Batlow to Wondalga
B5.2	Main Road	State Road	MR 85	Tumut	Wondalga to Gilmore
B6	Highway	State Road	SH 4	RTA	Gilmore to Tumut
B7.1	Main Road	Regional Road	MR 279	Tumut	Tumut to Gundagai
B7.2	Main Road	Regional Road	MR 279	Gundagai	Tumut to Gundagai

Primary Network (remainder)

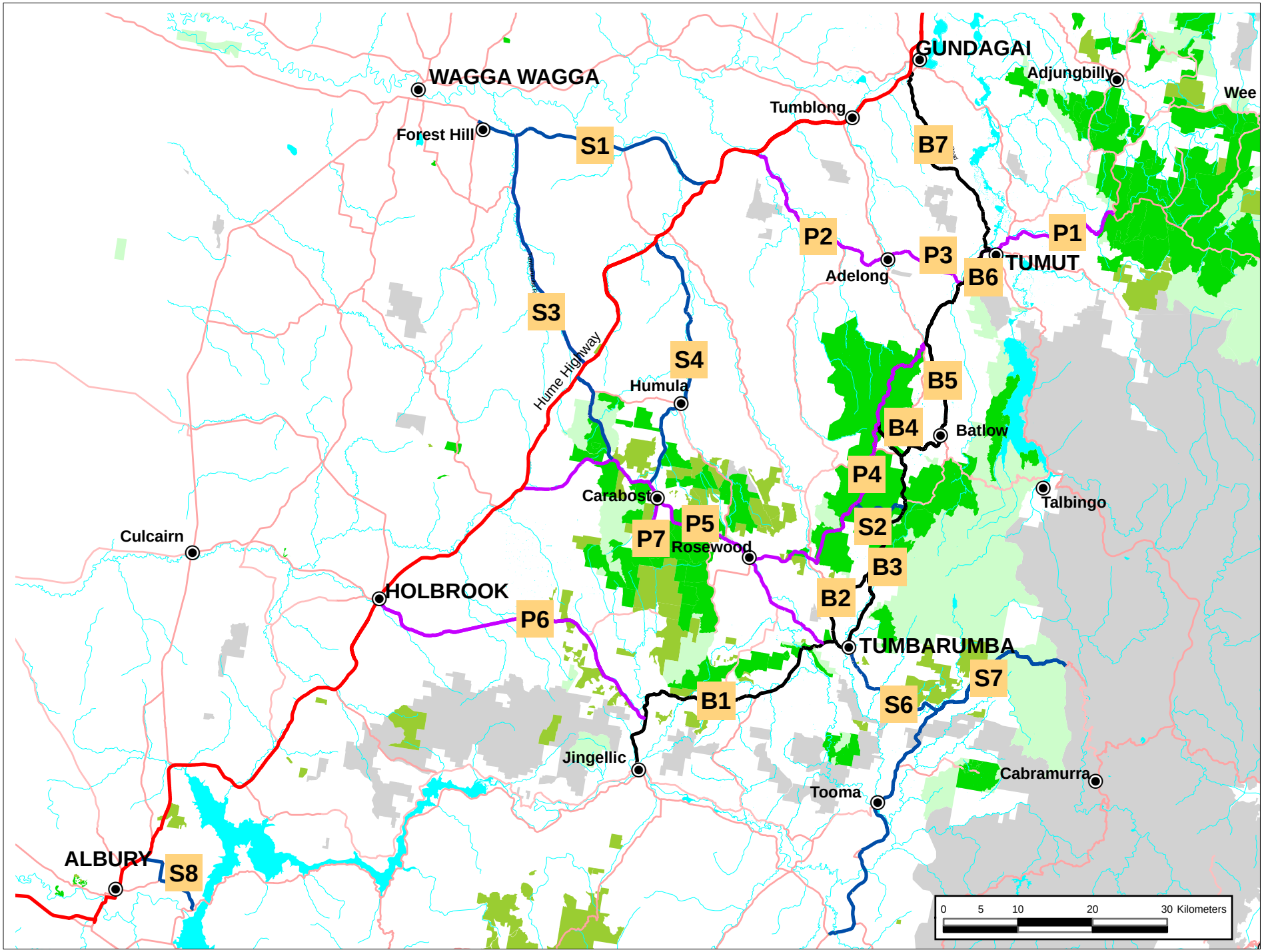
changes from previous study version highlighted

Map Reference	Classification	Management Category	Road Number	LGA or Authority	Additional Link Description
P1.1	Unclassified	Local Road	Bombowlee Creek Road	Forests NSW	Brindabella/WeeJasper Roads to Tumut
P1.2	Unclassified	Local Road	Bombowlee Creek Road	Tumut	Brindabella/WeeJasper Roads to Tumut
P1.3	Main Road	Regional Road	MR 278	Tumut	Bombowlee Creek Rd to Tumut
P2.1	Highway	State Road	SH 4	RTA Tumut	Gilmore to Visy Turnoff
P2.2	Highway	State Road	SH 4	RTA Tumut	Visy Turnoff to Hume Highway
P3	Unclassified	Local Road	Visy Access	Tumut (Visy)	Snowy Mountains Highway to Visy
P4.1	Unclassified	Local Road	Wondalga Road → Greenhills Access Road Extension	Forests NSW	Wondalga to Broadleaf Park Link Road
P4.2	Main Road	Regional Road 7602	Broadleaf Park Link Road → Broadleaf Park Road Extension	Forests NSW assisting Tumbarumba	Wondalga Road to Rosewood
P4.3	Main Road	Regional Road 7602	Broadleaf Park Link Road	Tumbarumba	Wondalga Road to Rosewood
P5.1	Main Road	State Road	MR 284	Tumbarumba	Tumbarumba to MR384, Carabost
P5.2	Main Road	State Road	MR 284	Greater Hume	Tumbarumba to MR384, Carabost
P5.3	Main Road	State Road	MR 284	Greater Hume	MR 384, Carabost to Hume Highway

Map Reference	Classification	Management Category	Road Number	LGA or Authority	Additional Link Description
P6	Main Road	Regional Road	RR 331	Greater Hume	Main Road 85 to Holbrook
P7	Unclassified	Local Road	Coppabella Road	Greater Hume	Plantations to MR 284

Identified timber routes not currently in primary network

Map Reference	Classification	Management Category	Road Number	LGA or Authority	Additional Link Description
S1	Highway	State Road	SH 14	Wagga Wagga	Sturt Highway, Hume Highway to Wagga
S2	Unclassified	Local Road	Lochinvar Road	Forests NSW	Lochinvar to Wondalga Road
S3	Main Road	Regional Road	MR 384	Mainly Wagga Wagga, part Greater Hume	Carabost to Hume Highway at Kyeamba S3.1 and to Forest Hill S3.2
S4	Unclassified	Local Road	Humula Road	Mainly Wagga Wagga, part Greater Hume	Main Road 284 to Humula S4.1 and Humula to Tarcutta S4.2
S6	Main Road	Regional Road	MR 628	Tumbarumba	Main Road 628 Tumbarumba to Tooma and to Victoria
S7	Main Road	Regional Road 7603	Elliot Way	Tumbarumba	Elliot Way from Main Road 628 to plantations
S8.1	Highway	State Road	SH 20	RTA	Riverina Highway Heywoods Bridge to Wirlinga
S8.2	Unclassified	Local Road	Various roads	Greater Hume	Riverina Highway to Norske Skog Albury



Softwoods Working Group Haulage Routes

Refer to Appendices for description of specific routes

Legend

- Towns
- Backbone Network Road
- Primary Network Road
- Other Timber Routes
- Other Major Roads
- Drainage
- State forest Plantation
- State forest Native
- Private Plantations
- Joint Venture
- Nat. Park, Nat. Reserve etc

APPENDIX B ROAD CATEGORIZATION AND STANDARDS

Road Categorization (RC)		Terrain Classifications (TC)	Pavement Structure and Condition (PSC)
1	**No Road** - no construction exists – "Paper" Road only	**Flat** – road gradient less than 5% - maximum excavation and fills on road generally less than 600mm.	**No Pavement**
2	**Track** – Most primitive level, dozed track following existing terrain, no development of earthworks formation.	**Undulating** – rolling countryside – road generally follows terrain. Maximum excavation and fills on road less than 1 metre.	**Pavement (A)** – Minimal existing pavement. Extensive pavement failure: deformation, rutting, cracking and potholing. Full pavement replacement required.
3	**Graded Track (A)** – No significant pavement, minimal earthworks formation development, minimal vertical and horizontal alignment, minimal drainage, single lane construction with passing areas. Driving Speed: 0-60km/hr	**Hilly (1)** – road gradients between 5% and 8%. Excavations and fills on road up to 3 metres. Natural cross fall to 8%.	**Pavement (B)** – Minimal existing pavement. Extensive pavement failure: deformation, rutting, cracking and potholing. 50% of pavement requires replacement.
4	**Graded Track (B)** – as for 3 above except for being 2 lane.	**Hilly (2)** – road gradients between 5% and 12%. Excavations and fills on road up to 5 metres. Natural cross fall to 12%.	**Pavement (C)** – Adequate existing pavement. Substantial pavement failure: deformation, rutting, cracking and potholing. Greater than 20% of pavement requires replacement.
5	**Constructed Road** – Gravel pavement, reasonable vertical and horizontal alignment, reasonable drainage, single lane construction. Driving Speed: 80km/hr maximum	**Mountainous** – road gradients to 15%. Excavations and fills on road in excess of 5 metres. Steep natural cross fall.	**Pavement (D)** –Adequate existing pavement. Widespread pavement failure: deformation, rutting, cracking and potholing. 10% to 20% of pavement requires replacement.
6	**Constructed Roads** – as for 5 above except for 2 lanes.		**Pavement (E)** – Strong, adequate existing pavement. Some pavement failure: deformation, rutting, cracking and potholing. Less than 10% of pavement requires replacement.
7	**Sealed Road (A)** – Gravel pavement and adequate shoulders, reasonable vertical and horizontal alignment, adequate drainage, single lane seal. Driving Speed: 80km/hr maximum		**Pavement (F)** – Strong adequate existing pavement. No replacement.
8	**Sealed Road (B)** – as for 7 above except 2 lanes.		
9	**Sealed Road (C)** – Gravel Pavement and shoulders, good vertical and horizontal alignment, good drainage, 2 lane seal with lane markings. Driving Speed: 100km/hr		
10	**Sealed Road (D)** – as for 9 above including sealed shoulders, and providing adequate overtaking opportunity (extra lanes, dual carriageways).		

Appendix B: Road Network Link Data

South West Slopes Logging Road Links, Classifications and Standards

Note 1 Road classification fields: For conditions meeting general description but with standard deficiency a minus sign is added after the rating number

Raw and finished product and supplies →

Owner	Roadname	Map Reference	Link Length (kms)	Road Classsification	Terrain Classsification	Pavement Condition	Road Use - historic AADT	Road Use - forecast AADT	B- Double Y / N	Comments / Road Design Standard	Timber Haulage Volume 2 way in thousand tonnes pa 2010 - 2015	2016 - 2020
Tumbarumba	**MR85 Jingellic to MR331**	**B1.1**	15.6	6 to 8	3, 4 & 5	3	120 - 270	150 - 270	**Y**	Fully sealed, narrow weak pavement	100	120
Tumbarumba	**MR85 MR331 to Tumbarumba**	**B1.2**	35.7	6 & 9	4	3 to 4	91, 650 & 1500	91, 650 & 1500	Y	Narrow & Failed Pavement, poor surface	425	510
Tumbarumba	**Tumbarumba N/S Bypass - Courabyra Road**	**B2**	11.0	7	2	2	10	600	N	Narrow light pavement	*185*	*220*
Tumbarumba	**MR85 Tumbarumba to Batlow in Tumbarumba SC**	**B3.1**	21.6	9	4	3 to 4	588 & 1500	588 & 1500	Y	Poor Surface Condition, weak pavement	705	745
Tumut	**MR85 Tumbarumba to Batlow, in Tumut SC**	**B3.2**	14.15	8-	4	3 to 4	671	815	Part	Cotrams Rd to Lower Bago Rd B-double; poor pavement	575	690
Tumut	**Batlow Bypass**	**B4**	9	1	4	1	10	700		Narrow light pavement	*575*	*690*
Tumut	**MR85 Batlow to Wondalga**	**B5.1**	13.12	8 & 9	3 to 5	3 to 6	1061	1239	Y	Narrow widing section Ch 45.9 to 47.3km	575	690
Tumut	**MR85 Wondalga to Gilmore**	**B5.2**	10.34	9	5	4 to 7	1082	1304	Y	poor pavement condition	1475	1770
RTA	**Snowy Mountains Hwy Gilmore to Tumut**	**B6**	8	10	2 to 4	6 to 7	4500	4500		Highway standard	3015	3620
Tumut	**MR279, Gocup Rd, Tumut SC**	**B7.1**	16.63	8 and 8-	2 to 4	3 to 6	3214 & 1300	3458	Y	Two Hazardous crests. Width & pavement inadequate for heavy vehicle increase.	1415	1700
Gundagai	**MR279, Gocup Rd, Gundagai SC**	**B7.2**	17.00	8 and 8-	2 to 4	3 to 5	3214 or 1092	3458 or 1200	Y	Width and pavement inadequate for major heavy vehicle increase.	1415	1700
Tumut/Forests NSW	**MR278 & Bombowlee Ck Rd to Wee Jasper Rd**	**P1**	27.00	6 to 9	2 to 4	4 to 7	1911 & 240	2255	Y	Maintained by SF, some failed pavement	1020	1220
RTA	**Snowy Mountains Hwy, Gilmore to Visy T/O**	**P2.1**	6.0	9	4	6 to 7	2045	2045	Y	needs Intersection upgrade at SH4/MR85	3210	3850
RTA	**Snowy Mountains Hwy Visy, T/O to Hume Hwy**	**P2.2**	34.0	9	3 & 4	6 to 7	1800	2100	Y	Approaches to Adelong poor and curfew on Visy trucks	780	935
Tumut	**Visy Access Road**	**P3**	2.13	9	2	6 to 7	10	510	N	Recently built to standard	3420	4100
Forests NSW	**Wondalga Rd, Wondalga to Taradale**	**P4.1**	20.6	8, 8-, 9 & 10	3 to 5	2 to 6	40	40	N	Built for log traffic. SF funding	900	1080
Tumbarumba	**RR7602 Broadleaf Park Rd Taradale to Rosewood**	**P4.2, P4.3**	9.6	10	4	4 to 6	160	160	Y	Poor Surface Condition	900	1080
Tumbarumba	**MR284, Tumbarumba to Rosewood**	**P5.1**	21.1	9	3 & 4	5 to 6	630	630	Y	Poor Surface Condition	670	805
Greater Hume	**MR284, Rosewood to Carabost**	**P5.2**	13.4	8 and 8-	3	5 to 7	509 to 600	509 to 600	Y	Previous grant works to standard	600	720
Greater Hume	**MR284, Carabost to Little Billabong**	**P5.3**	14.1	9	1 & 4	5 to 7	330	240	Y	Previous grant works to standard	470	565
Tumbarumba	**MR331, MR85 to Holbrook**	**P6**	45.7	7, 8-, 8 & 9	1 to 4	4 to 6	187	187	Y *	Width and pavement substandard for increasing use and mix	440	530
Greater Hume	**Coppabella Road, Plantations to MR 284**	**P7**	16	5	3 to 4	3	40	40	Y	Narrow light pavement	180	410
RTA	**Sturt Highway, Forest Hill to Tarcutta**	**S1**	**50**	10	1 to 3	7	4000	4000	Y	Highway standard	305	350
Forests NSW	**Lochinvar Rd**	**S2**	8.0	6	4	4		50	N	Forests NSW Works done	40	50
Tumbarumba	**MR384 Carabost to Hume Hwy**	**S3.1**	13.4	8	3	4	260	260	N	Previous grant works to standard	20	25
Wagga Wagga	**MR384, Hume Hwy to Forest Hill**	**S3.2**	33.8	6	4	4	380	300-750	N	Previous grant works to standard	20	25
Tumbarumba	**Downfall Road, Carabost to Humula**	**S4.1**	24.0	6	2 to 4	3	20	20	N	Narrow light pavement	45	55
Wagga Wagga	**Humula Road, Humula to Tarcutta**	**S4.2**	22.5	6	2 to 4	3	20	20	N	Narrow light pavement	30	35
Tumbarumba	**MR628, Tumbarumba to Vic Border**	**S6**	38.4	9	3 to 5	3 to 5	190 to 390	190 to 390	Part	Narrow & Failed Pavement, poor surface	50	60
Tumbarumba	**RR7603 Elliot Way**	**S7**	21.7	8-	3 to 5	3 to 4	124	124	N	Narrow alignment and thin pavement	20	25
RTA	**Riverina Highway, Vic Border to Wirlinga**	**S8.1**	12.5	6 to 10	2	3 to 7	2400	2000-6000	N	Highway standard	190	226
Hume/Albury	**Through Albury / suburbs**	**S8.2**	16.0	7	2	4 to 6	Low to 26000	various	N	Using existing roads of fair standard	190	220

* Bdouble except for Chinaman's Gap

APPENDIX C – WOODFLOW SUPPLY, USAGE AND CARTAGE ASSUMPTIONS

1. Plantation yield and industrial production estimates are based on estimates provided by Forests NSW, other log suppliers and the processing industries.
2. Future supplies of raw materials and distribution of finished products are estimated to be more or less in proportion to current activities on existing road links.
3. Quantity estimates are within ±10% accuracy at November 2009, with some divergence in future years.
4. A broad variety of truck configurations is employed carting plantation inputs and outputs and finished product. As a rough rule of thumb for pavement designs only, timber truck haulage loading could be based on 9 axle B Double trucks and assume a Gross Combination Mass of 62.5 tonnes and a payload of 40 tonnes. This leads to the assumption of 6.34 ESA/vehicle loaded (and an assumed 1.5 ESA/vehicle unloaded) for each 40 tonnes hauled. Ie approximately 0.2ESA per tonne hauled.
5. Planned cartage volumes are shown on the product haulage summary below.

	Visy	CHH Timber	CHH Panel	Hyne	Ausply	Norske Skog	TOTALS		
INBOUND									
Product	**Tonnes/Year**							**Ave Load Tonnes**	**Truck Movts**
Sawlogs		667,500		855,000	60,000		1,582,500	25	63,280
Pulplogs	1,451,000				(peeler logs)	410,000	1,861,000	30	62,033
Sawmill Chips	662,000					(of this 310,000 is from NSW on study roads)	662,000	30	22,067
Boiler Fuel	66,000						66,000	20	3,300
Recycled Paper	156,800						156,800	30	5,227
Purchased Pulp	30,000		25,000				55,000	40	1,375
Chemicals	36,732						36,732	25	918
Totals	**2,402,532**	**667,500**	**25,000**	**855,000**	**60,000**	**410,000**	**4,420,032**		**158,200**
			From MDF						
OUTBOUND									
Structural Timber		235,800	160,000	298,680	30,000		724,480	32	22,640
Finished Paper	700,000					150,000	850,000	33	25,758
Waste	24,055						24,055	10	2,406
	724,055	**235,800**	**160,000**	**298,680**	**30,000**	**150,000**	**1,598,535**		**50,804**
Total	**3,126,587**	**903,300**	**185,000**	**1,153,680**	**100,000**	**560,000**	**6,018,567**		**209,004**
							Check - Ave Load		28.80

APPENDIX D Logging Road Upgrading Needs

NOTE: *Roads are categorised according to LGA for convenience and consistency between this and previous reports. The primary funding responsibility depends on the actual road classification (see App. A)*

Greater Hume Shire Council

Map Reference	Road Number	Road Management Strategy	Starting condition and Planned Outcome of Strategy
P5.2	MR 284, Tumbarumba to MR384, Carabost	Generally very good standard, 7.6 m seal, adequate pavement. Routine Maintenance and Periodic Heavy Patching	**Now:** Road standard generally adequate – some wet pavement problems need periodic repair. **Outcome**: a safe and efficient road that will only require routine maintenance
P5.3	MR 284, MR 384, Carabost to SH2	Condition varies: 6.0 - 7.6 m seal, 6.1 m bridge at Vokins Creek. Alignment at 100km/hr except for Williams Gap which warrants improvement to provide a consistent standard Routine Maintenance and Periodic Heavy Patching	**Now:** Road standard generally adequate – some wet pavement problems need periodic repair. **Outcome**: a safe and efficient road that will only require routine maintenance
P6 (was S5)	MR 331, MR 85 to Holbrook	The Yarara Gap is deficient: 4.8 m seal, narrow culverts, poor alignment. Needs improvement. General age of the pavements - largely pre 1960's west of the gap, and some poor alignment around the Annandale road Routine Maintenance and Periodic Heavy Patching	**Now:** Much of the pavement is not capable of carrying loading. Major parts are dangerously narrow and with poor alignment not suited to heavy and mixed local use. **Outcome:** Aim to establish a safe and efficient road capable of carrying loads that would require only routine maintenance. Improved safety of non industry road users
P7	Coppabella Road, Plantations to MR284	Widening and strengthen sections that are below standard and sealing gravel sections. Minor improvement to alignment on substandard curves. Routine Maintenance. Regular Heavy Patching until suitable standard achieved.	**Now:** Generally below needed standard width. Pavement not capable of carrying loading and partly unsealed. Not suitable in current standard. **Outcome:** Aim to establish a safe and efficient road capable of carrying loads requiring only routine maintenance.
S3.1	MR 384, Carabost to SH2, Kyeamba	Greater Hume section (1.6 km) reconstructed in 1999 - 7.2 m seal, 80 km/hr design speed. Wagga City section has been widening progessively over past 4 years - largely complete	**Analysis not in ambit of this report**
S4.1	Humula Road, MR284 to Humula	4.8m seal. Doubtful pavement & poor alignment. Mainly forestry related traffic - about 40 vpd. Large scale works required before it could be considered for a haul road	**Analysis not in ambit of this report**
S8.2	Various roads Riverina Highway to Norske Skog Albury	No specific works proposed at this stage. General maintenance by council	**Analysis not in ambit of this report**

Gundagai Shire Council

Map Reference	Road Number	Road Management Strategy	Starting condition and Planned Outcome of Strategy
B7.2	MR 279, Gocup Road (Tumut SC boundary) to Gundagai	Widening and strengthen sections that are below standard for much higher heavy traffic. Minor improvement to alignment on several substandard curves. Two sections need climbing lanes. Routine Maintenance and significant Periodic Heavy Patching	**Now:** Sections below current standard width. Pavement not capable of carrying loading and are dangerously narrow. **Outcome:** Aim to establish a safe and efficient standard requiring only routine maintenance. Improved safety of non industry road users

Forests NSW

Map Reference	Road Number	Road Management Strategy	Starting condition and Planned Outcome of Strategy
P1.1	Bombowlee Creek Road Brindabella & Wee Jasper Roads to Tumut	Much of the link has been brought to a suitable standard. Routine Maintenance and significant periodic Heavy Patching due to high loading. Sections of pavement failure to be prioritised to provide specific curve widening and strengthening.	**Now:** Specific lengths of aging pavement in need of reconstruction, with seal degradation evident on other zones **Outcome:** Aim to establish a safe and efficient, and environmentally sound road environment requiring only routine maintenance
P4.1	Wondalga Road Wondalga to Broadleaf Park Link Road	Parts of the link has been brought to a suitable standard. Other sections of pavement failure to be prioritised to provide specific curve widening and strengthening.	**Now:** Specific lengths of aging pavement in need of reconstruction, with seal degradation evident on other zones **Outcome:** Aim to establish a safe and efficient, and environmentally sound road environment requiring only routine maintenance

Roads and Traffic Authority NSW

Map Reference	Road Number	Road Management Strategy	Starting condition and Planned Outcome of Strategy
B6	SH 4, Gilmore to Tumut	Constructed to State Highway standard. Requires periodic patching of pavements where water infiltrates	**Now:** Road standard generally adequate **Outcome**: maintaining a safe and efficient road
P2.1	SH 4, Gilmore to Visy Turnoff	Constructed to State Highway standard. Requires periodic patching of pavements where water infiltrates	**Now:** Road standard generally adequate **Outcome**: maintaining a safe and efficient road

Map Reference	Road Number	Road Management Strategy	Starting condition and Planned Outcome of Strategy
P2.2	SH 4, Visy Turnoff to Hume Highway	Generally to State Highway standard. Adelong approaches warrant improvement. Aim to allow removal of curfew on haulage to and from Visy Requires periodic pavement	**Now:** Road standard generally adequate **Outcome**: maintaining a safe and efficient road, improving Adelong section
S1	SH 14, SH2 to Wagga Wagga	Constructed to State Highway standard. Requires periodic patching of pavements when water infiltrates	**Analysis not in ambit of this report**
S8.1	SH 20, Heywoods Bridge to Wirlinga	Generally constructed to State Highway standard. Immediate approaches to Victorian border need alignment improvement	**Analysis not in ambit of this report**

Tumbarumba Shire Council

Map Reference	Road Number	Road Management Strategy	Starting condition and Planned Outcome of Strategy
B1.1	MR 85, Jingellic to MR 331	Border to MR331 and Carboona Gap: 1960's Construction, 4.8 - 5.5 m seal. Stability of some cuts of some concern. Requires guard fence replacement and formation widening. Routine Maintenance and significant Periodic Heavy Patching	**Now:** Much of pavement not capable of carrying loading. Road is narrow and has poor alignment in sections. **Outcome:** Aim to establish a safe and efficient road capable of carrying loads. Would require only routine maintenance
B1.2	MR 85, MR331 to Tumbarumba	Widening and strengthen sections that are below standard = 95% of length. Priorities: Widening Mannus Hill and intersection with Mannus-Glenroy Road (severe crest with high accident potential) Routine Maintenance and significant Periodic Heavy Patching	**Now:** 95% of pavement not capable of carrying loading. Road is narrow and has poor alignment in sections. **Outcome:** To establish safe and efficient road capable of carrying loads. Would require only routine maintenance
B2	Courabyra Road Tumbarumba Bypass	Full reconstruction to allow passage of heavy timber transports	**Now:** 100% of pavement not capable of carrying heavy vehicle loading. Narrow with poor alignment in sections. **Outcome:** To establish safe and efficient road for heavy traffic bypassing Tumbarumba and requiring only routine maintenance
B3.1	MR 85 Tumbarumba to Batlow	Widening and strengthen sections that are below standard = 85% of length. Included replacement of Jackson's Bridge and approaches (high accident potential). Routine Maintenance and Patching	**Now:** 85% of pavement not capable of carrying loading. Road has some sections that are narrow and have poor alignment. **Outcome:** To establish a safe and efficient road capable of carrying loads requiring only routine maintenance

Map Reference	Road Number	Road Management Strategy	Starting condition and Planned Outcome of Strategy
P4.2, P4.3	RR7602 Broadleaf Park Link Road Wondalga Road to Rosewood	Pavement strengthening required for approximately 70% of length. Some sections of widening and minor realignment Routine Maintenance and Patching	**Now:** 70% of pavement not capable of carrying loading. Road has some sections that have poor alignment. **Outcome:** To establish a safe and efficient road capable of carrying loads requiring only routine maintenance
P5.1	MR 284 Tumbarumba to Hume Highway	Generally pavement strengthening only required for approximately 75% of length, Alignment and width are adequate. Routine Maintenance and Patching	**Now:** 70% of pavement not capable of carrying loading. Road has some sections that have poor alignment. **Outcome:** To establish a safe and efficient road capable of carrying loads requiring only routine maintenance
S2	Lochinvar Road Lochinvar to Wondalga Road	TbSC to advise any expenditure intentions and needs: $ and descriptions	**Analysis not in ambit of this report**
S6	MR 628 Tumbarumba to Tooma and to Victoria	Widening and Strengthening of 90% of length up to Maragle Rd (27.8 km) to service softwood plantations Routine Maintenance and Patching	**Now:** 90% of pavement not capable of carrying loading. Road has numerous sections that are narrow and have poor alignment. **Outcome:** Need to establish a safe and efficient road capable of carrying loads. Would require only routine maintenance
S7	RR7603 Elliott Way	Widening, realignment and strengthening of full length to serve new and existing softwood and hardwood forests Routine Maintenance and Patching	**Now:** 100% of pavement not capable of carrying loading. Road has numerous sections that are narrow and have poor alignment. **Outcome:** Need to establish a safe and efficient road capable of carrying loads. Would require only routine maintenance

Tumut Shire Council

Map Reference	Road Number	Road Management Strategy	Starting condition and Planned Outcome of Strategy
B3.2	MR 85, Tumbarumba SC to Batlow	Widening and strengthen sections that are below standard. Minor improvement to alignment on substandard curves Routine Maintenance and significant Heavy Patching	**Now:** Sections of road are narrow and the pavement is not capable of carrying sustained of loads in wet weather. **Outcome:** Will provide safe and efficient road for year round use. Improved safety of non industry road users
B4	Batlow Bypass	Full reconstruction to allow passage of heavy timber transports. Route yet to be determined. Informal route being used	**Now:** B-doubles can't pass through Batlow due to poor alignment. **Outcome:** alleviation of traffic issue in Batlow and provision of B-double route on timber roads backbone route

Map Reference	Road Number	Road Management Strategy	Starting condition and Planned Outcome of Strategy
B5.1	MR 85, Batlow to Wondalga	Widening and strengthen sections that are below standard. Minor improvement to alignment on substandard curves Routine Maintenance and significant Heavy Patching	**Now:** Sections of road are narrow and the pavement is not capable of carrying sustained of loads in wet weather. **Outcome:** Will provide safe and efficient road for year round use
B5.2	MR 85, Wondalga to Gilmore	Widening and strengthen sections that are below standard. Minor improvement to alignment on substandard curves Routine Maintenance and Patching	**Now:** Sections of road are narrow and the pavement is not capable of carrying sustained of loads in wet weather. **Outcome:** To provide a safe and efficient road for year round use
B7.1	MR 279, Tumut to Gundagai	Widening and strengthen sections that are below standard for now much higher heavy traffic. Minor improvement to alignment on several substandard curves. One section needs a climbing lane and a new roundabout at junction with Snowy Mountains Highway. Routine Maintenance and significant Periodic Heavy Patching	**Now:** Sections of road are narrow and the pavement is not capable of carrying sustained of loads in wet weather. **Outcome:** Aim to establish a safe and efficient, and environmentally sound road environment requiring only routine maintenance
P1.2	Bombowlee Creek Road Brindabella & Wee Jasper Roads to Tumut	Some sections need strengthening Routine Maintenance and significant periodic Heavy Patching due to high loading	**Now:** road has been widened, however pavement is not capable of carrying sustained of loads in wet weather. **Outcome:** Providing a safe and efficient road that will only require routine maintenance over the next 20 to 30 years
P1.3	MR 278, Bombowlee Creek Road to Tumut	Some sections need strengthening Routine Maintenance and significant periodic Heavy Patching due to high loading	**Now:** Road has been widened, however pavement is not all capable of carrying sustained of loads in wet weather. **Outcome:** Providing a safe and efficient road that will only require routine maintenance over the next 20 to 30 years
P1.4	Brindabella Rd from bridge Rd to Wyora Rd	Widening and strengthen sections that are below standard for now much higher heavy traffic. Minor improvement to alignment on several substandard curves. Routine Maintenance and significant Periodic Heavy Patching	**Now:** Sections of road are narrow and the pavement is not capable of carrying sustained loads in wet weather. **Outcome:** Aim to establish a safe, efficient, and environmentally sound road environment requiring only routine maintenance

Visy

Map Reference	Road Number	Road Management Strategy	Starting condition and Planned Outcome of Strategy
P3	Visy Access Road, SH4 to Visy	Recently constructed to required standard	**Outcome:** a safe and efficient road that will only require routine maintenance and patching over the next 30 years

Wagga Wagga City Council

Map Reference	Road Number	Road Management Strategy	Starting condition and Planned Outcome of Strategy
S3.2	MR 384 Kyeamba to Forest Hill	Wagga City section widened progressively over several years Routine Maintenance and Periodic Heavy Patching	**Analysis not in ambit of this report**
S4.2	Humula Road Humula to Tarcutta	Narrow seal. Doubtful pavement and alignment. Improvement works needed Routine Maintenance and Patching	**Analysis not in ambit of this report**

APPENDIX E - WORKS PROGRAMS

Appendix E: Road Works Program. SWS Logging Roads: works recommended in last report issue

Roadname	Status of project
TUMUT	
MR85 Tumbarumba to Batlow, B3.2	5 Mile hill section constructed
Batlow Bypass	Informal route improved by Forests NSW
MR85 Batlow to Wondalga B5.1	Patching and drainage. No improvement works
MR85 Wondalga to Gilmore B5.2	Intersection SH4/MR85: Reconstruct, widen bridge done
Snowy Mountains Hwy Gilmore to Tumut	Maintenance only
MR279, Gocup Rd, Tumut SC B7.1	Patching 4.05 to 5.4, Rocky Gully Road corner and minor works
TUMUT and FORESTS NSW	
MR278 & Bombowlee Ck Rd to Wee Jasper Rd P1	Upgrading by Forests NSW
GUNDAGAI	
MR279, Gocup Rd, Gundagai SC B7.2	Strengthened sections: 3.8 - 5.5km, 8.6 - 13km inc Stoney Ck Bridge Construction by Special Grant,
TUMBARUMBA	
RR7602 Broadleaf Park Rd Taradale to Rosewood P4.2	Strengthened 0.9 to 1.96km
MR284 Tumbarumba to Rosewood P5.1	Rehabilitation near Boral/Hyne done
MR284 Tumbarumba to Rosewood P5.1	Strengthened 1.36 to 2.26km
MR284 Tumbarumba to Rosewood P5.1	Heavy patching 5.05 to 6.47km
MR284 Tumbarumba to Rosewood P5.1	Strengthened 6.47 to 7.65km
MR85 Jingellic to Tumbarumba, B1.2	Rehabilitation near Boral/Hyne done
Tumbarumba N/S Bypass - Courabyra Road	No Work
MR85 Tumbarumba to Batlow, B3.1	No Work
MR85 Tumbarumba to Batlow, B3.1	No Work
MR85 Jingellic to Tumbarumba, TbSC B1.1	Patching and Drainage along MR85 Gravel sections upgraded
MR85 Jingellic to Tumbarumba, TbSC B1.1	Widen & overlay Seg 10 0 to 1.76km
MR85 Jingellic to Tumbarumba, TbSC B1.1	Widen & overlay Seg 20 0 to 1.67km
MR85 Jingellic to Tumbarumba, TbSC B1.1	Widen & overlay Seg 40 0 to 1.27km
MR85 Jingellic to Tumbarumba, TbSC B1.1	Widen & overlay Chainage 4000-5063
RTA	
SH4 Adelong, P2.2	Reconstruction of intersection with local roads
MR331 MR 85 to Holbrook, P6	Special Grant for improvements near Yarara Gap
GREATER HUME	
Coppabella Road, P7	Reconstruction steep hill east of McGinnity's Gap Rd; gravel patching; reseal to 2.8km south of Tumbarumba Road

Appendix E: Road Works Program. SWS Logging Roads Historic Funding - Maintenance Grants & Routine Expenditure

Roadname	Map Reference	Link Length	Resealing	Annual Expenditure - General Maintenance	Est Rates for Patching Works per m2	Est. Annual Maintenance Expenditure on Link
MR85 Jingellic to MR331	B1.1	15.6	$23,400	$39,000	$55 for heavy patching, $90 to $130 for	$93,600
MR85 MR331 to Tumbarumba	B1.2	35.7	$71,440	$89,300	$55 for heavy patching, $90 to $130 for	$214,320
Tumbarumba N/S Bypass - Courabyra Road	B2	11.0	NA	NA	NA	NA
MR85 Tumbarumba to Batlow in Tumbarumba SC	B3.1	21.6	$32,400	$54,000	$65 for heavy patching, $100 to $150 for	$140,400
MR85 Tumbarumba to Batlow, in Tumut SC	B3.2	14.15	$28,300	$56,600	$65 for heavy patching, $100 to $150 for	$91,975
Batlow Bypass	B4	9	NA	NA	NA	NA
MR85 Batlow to Wondalga	B5.1	13.12	$26,240	$52,480	$65 for heavy patching, $100 to $150 for	$85,280
MR85 Wondalga to Gilmore	B5.2	10.34	$31,020	$41,360	$65 for heavy patching, $100 to $150 for	$72,380
Snowy Mountains Hwy Gilmore to Tumut	B6	8	NA	NA	NA	RTA highway
MR279, Gocup Rd, Tumut SC	B7.1	16.63	$49,890	$83,150	$65 for heavy patching, $100 to $150 for	$116,410
MR279, Gocup Rd, Gundagai SC	B7.2	17.00	$51,000	$85,000	$65 for heavy patching, $100 to $150 for	$119,000
MR278 & Bombowlee Ck Rd to Wee Jasper Rd	P1	27.00	$81,000	$135,000	$65 for heavy patching, $100 to $150 for	$175,500
Snowy Mountains Hwy, Gilmore to Visy T/O	P2.1	6.0	NA	NA	NA	RTA highway
Snowy Mountains Hwy Visy, T/O to Hume Hwy	P2.2	34.0	NA	NA	NA	RTA highway
Visy Access Road	P3	2.13	$6,390	$12,780	$65 for heavy patching, $100 to $150 for	$15,975
Wondalga Rd, Wondalga to Taradale	P4.1	20.6	$61,800	$82,400	$65 for heavy patching, $100 to $150 for	$133,900
RR7602 Broadleaf Park Rd Taradale to Rosewood	P4.2, P4.3	9.6	$28,800	$38,400	$ 40 to $70 for heavy patching, $25 to $50 for overlays	$62,400
MR284, Tumbarumba to Rosewood	P5.1	21.1	$42,200	$84,400	$65 for heavy patching, $100 to $150 for	$137,150
MR284, Rosewood to Carabost	P5.2	13.4	$26,800	$53,600	$65 for heavy patching, $100 to $150 for	$87,100
MR284, Carabost to Little Billabong	P5.3	14.1	$28,200	$56,400	$65 for heavy patching, $100 to $150 for	$91,650
MR331, MR85 to Holbrook	P6	45.7	$91,400	$114,250	$55 for heavy patching, $90 to $130 for	$274,200
Coppabella Road, Plantations to MR 284	P7	16	$32,000	$40,000	$55 for heavy patching, $90 to $130 for	$96,000
Sturt Highway, Forest Hill to Tarcutta	S1	50	NA	NA	NA	RTA highway
Lochinvar Rd	S2	8.0	$12,000	$24,000	$55 for heavy patching	$24,000
MR384 Carabost to Hume Hwy	S3.1	13.4	$20,100	$53,600	$55 for heavy patching	$80,400
MR384, Hume Hwy to Forest Hill	S3.2	33.8	$50,700	$135,200	$55 for heavy patching	$202,800
Downfall Road, Carabost to Humula	S4.1	24.0	$36,000	$72,000	$55 for heavy patching	$120,000
Humula Road, Humula to Tarcutta	S4.2	22.5	$33,750	$67,500	$55 for heavy patching	$112,500
MR628, Tumbarumba to Vic Border	S6	38.4	$57,600	$115,200	$55 for heavy patching	$211,200
RR7603 Elliot Way	S7	21.7	$32,550	$65,100	$55 for heavy patching	$119,350
Riverina Highway, Vic Border to Wirlinga	S8.1	12.5	NA	NA	NA	RTA highway
Through Albury / suburbs	S8.2	16.0	$32,000	$64,000	$65 for heavy patching	$104,000
LINEMARKING NETWORK	Length	622.09			total for network:	$1,119,762
marking: Average $1800/km (varying Centreline and edgeline combinations						
	Subtotals:		$986,980		Total primary network	$5,088,232

Averaged based on assumed Reseal cost $30,000/km and frequency per colour code: 20 years 15 years 10 years

Appendix E: Recommended Road Works Program

SWS Logging Roads Major Works needed

Owner	Roadname	Map Reference	Link Length	Work Location	Description	Cost	Proposed Timing
Tumbarumba	**MR85 Jingellic to MR331**	**B1.1**	15.6	Segment 50 to Holbrook Road	Widen Road and Overlay	$400,000	2009 - 2013
Tumbarumba	**MR85 MR331 to Tumbarumba**	**B1.2**	35.7	Segment 130	Horizontal alignment improvements		Post 2015
Tumbarumba	**MR85 MR331 to Tumbarumba**	**B1.2**	35.7	Segment 260 & 270	Vertical alignment improvement and widening		Post 2015
Tumbarumba	**MR85 MR331 to Tumbarumba**	**B1.2**	35.7	Segment 280 & 290	Horizontal alignment improvements & Widening		Post 2015
Tumbarumba	**MR85 MR331 to Tumbarumba**	**B1.2**	35.7	Segment 140 to 300	Widen Road and Overlay		Post 2015
Tumbarumba	**MR85 MR331 to Tumbarumba**	**B1.2**	35.7	Intersection MR284 & MR85	Strengthen pavement	$500,000	ASAP
Tumbarumba	**Tumbarumba N/S Bypass - Courabyra Road**	**B2**	11.0	Courabyra Upgrade	Bypass of town	$7,000,000	$21M when available
Tumbarumba	**MR85 Tumbarumba to Batlow in Tumbarumba SC**	**B3.1**	21.6	Jacksons Bridge	Realignment of Corner and Bridge		Post 2015
Tumbarumba	**MR85 Tumbarumba to Batlow in Tumbarumba SC**	**B3.1**	21.6	Segment 470	Improve Intersection with Courabyra Road	$100,000	Current program
Tumut	**MR85 Tumbarumba to Batlow, in Tumut SC**	**B3.2**	14.15		No Specific works beyond restoration		
Tumut	**Batlow Bypass**	**B4**	9		No Specific works beyond restoration		
Tumut	**MR85 Batlow to Wondalga**	**B5.1**	13.12		No Specific works beyond restoration		
Tumut	**MR85 Wondalga to Gilmore**	**B5.2**	10.34		No Specific works beyond restoration		
RTA	**Snowy Mountains Hwy Gilmore to Tumut**	**B6**	8	State (RTA) funded	No Specific works beyond restoration		
Tumut	**MR279, Gocup Rd, Tumut SC**	**B7.1**	16.33	0 to 0.2 km from Snowy Mountains Highway	Full intersection reconstruction and approaches	$3,500,000	High Priority
Tumut	**MR279, Gocup Rd, Tumut SC**	**B7.1**	16.33	0.2 to 1.3 km from Snowy Mountains Highway, Gilmore Creek	Pavement widening/reconstruction and realignment where required. Assumes Gilmore creek bridge not to be replaced	$880,000	Medium Priority
Tumut	**MR279, Gocup Rd, Tumut SC**	**B7.1**	16.33	1.3 to 2.3 km from Snowy Mountains Highway	Knox's Hill Overtaking Lane	$570,000	Low Priority
Tumut	**MR279, Gocup Rd, Tumut SC**	**B7.1**	16.33	2.3 to 4.05 km from Snowy Mountains Highway Knox's Hill to Gocup Farm Road	Stabilise subbase and overlay	$1,436,000	Medium Priority
Tumut	**MR279, Gocup Rd, Tumut SC**	**B7.1**	16.33	3.35 to 4.05 km from Snowy Mountains Highway Gocup Farms Road patch	Cut down crests, stabilise	$450,000	Current program
Tumut	**MR279, Gocup Rd, Tumut SC**	**B7.1**	16.33	4.71 to 4.96 km from Snowy Mountains Highway Jefrees Patch	Stabilise	$50,000	Planning in hand
Tumut	**MR279, Gocup Rd, Tumut SC**	**B7.1**	16.33	5.4 to 7.15 km from Snowy Mountains Highway. Smarts Lane to Rocky Gully Rd	Stabilise, Guardfence and overlay	$1,500,000	Low Priority
Tumut	**MR279, Gocup Rd, Tumut SC**	**B7.1**	16.33	5.6 to 5.9 from km from Snowy Mountains Highway. Smarts lane fills	Widening and guardfence; extend culvert	$194,000	High Priority
Tumut	**MR279, Gocup Rd, Tumut SC**	**B7.1**	16.33	7 to 7.15 from km from Snowy Mountains Highway. Rocky Gully Road culvert	Extend culvert, widen formation, guardfence	$200,000	Current program
Tumut	**MR279, Gocup Rd, Tumut SC**	**B7.1**	16.33	8 to 8.7 km from Snowy Mountains Highway. Gocup School project	Establish borrow pit - to become overtaking lane; Realignment and widening	$1,258,000	Medium Priority
Tumut	**MR279, Gocup Rd, Tumut SC**	**B7.1**	16.33	8.7 to 9.7 km from Snowy Mountains Highway. Meadow Creek	Extend box culvert, widen formation, guardfence, realign corner	$1,438,000	High Priority
Tumut	**MR279, Gocup Rd, Tumut SC**	**B7.1**	16.33	9.7 to 12 km from Snowy Mountains Highway. Pink Pig to Quidong	Formation widening, drainage, stabilise, overlay	$2,090,000	Low Priority
Tumut	**MR279, Gocup Rd, Tumut SC**	**B7.1**	16.33	10.2 to 10.7 km from Snowy Mountains Highway. Crest before Eurobin	Improve dangerous crest/curve	$500,000	High Priority
Tumut	**MR279, Gocup Rd, Tumut SC**	**B7.1**	16.33	12 to 15.3 km from Snowy Mountains Highway. Mingary/Quidong	Culvert extension, curve improvement, widening, guardfencing	$3,674,000	High Priority

Appendix E: Recommended Road Works Program

SWS Logging Roads Major Works needed

Owner	Roadname	Map Reference	Link Length	Work Location	Description	Cost	Proposed Timing
Tumut	**MR279, Gocup Rd, Tumut SC**	**B7.1**	16.33	13.1 to 13.6 km from Snowy Mountains Highway. Quidong bus stop	Widen, stabilise, overlay	$500,000	Current program
Tumut	**MR279, Gocup Rd, Tumut SC**	**B7.1**	16.33	15.3 to 16.2 km from Snowy Mountains Highway. Mingary	Improve to standard; most OK	$727,200	Low Priority
Gundagai	**MR279, Gocup Rd, Gundagai SC**	**B7.2**	17.00	16.2 to 16.7 km from Snowy Mountains Highway (GSC / TSC boundary)	Extend Culvert , realign and strengthen	$578,000	High Priority
Gundagai	**MR279, Gocup Rd, Gundagai SC**	**B7.2**	17.00	16.7 to 17.9 km from Snowy Mountains Highway. Halfway Hill	Culvert extension, curve improvement, widening, guardfencing, Overtaking Lane	$2,106,000	High Priority
Gundagai	**MR279, Gocup Rd, Gundagai SC**	**B7.2**	17.00	17.9 to 19 km from Snowy Mountains Highway. The Halfway	Widen Formation, strengthen pavement	$1,380,000	Medium Priority
Gundagai	**MR279, Gocup Rd, Gundagai SC**	**B7.2**	17.00	19 to 20.8 km from Snowy Mountains Highway. Doctor's Hill	Overtaking Lane, Overlay	$2,848,000	High Priority
Gundagai	**MR279, Gocup Rd, Gundagai SC**	**B7.2**	17.00	24.8 to 26.1 km from Snowy Mountains Highway. Kookoomooroo Hill	Widen formation, overtaking lane, kerb at base of cut	$680,000	Medium Priority
Gundagai	**MR279, Gocup Rd, Gundagai SC**	**B7.2**	17.00	25.1 to 25.7 km from Snowy Mountains Highway. Kookoomooroo Hill	Realign, strengthen, guardfence	$1,178,000	High Priority
Gundagai	**MR279, Gocup Rd, Gundagai SC**	**B7.2**	17.00	26.1 to 26.8 km from Snowy Mountains Highway. Borrow Pit	Realign through borrow pit	$560,000	Medium Priority
Gundagai	**MR279, Gocup Rd, Gundagai SC**	**B7.2**	17.00	26.8 to 28.3 km from Snowy Mountains Highway. Abbattoirs	Pavement strengthening	$1,200,000	Medium Priority
Gundagai	**MR279, Gocup Rd, Gundagai SC**	**B7.2**	17.00	27 to 28.1 km from Snowy Mountains Highway. Abbattoirs	Widen formation, overtaking lane, final pavement	$680,000	Low Priority
Gundagai	**MR279, Gocup Rd, Gundagai SC**	**B7.2**	17.00	29.8 to 30.1 km from Snowy Mountains Highway. Service Centre	Restore pavement with AC overlay.	$500,000	Medium Priority
SF	**MR278 & Bombowlee Ck Rd to Wee Jasper Rd**	**P1**	27.00	Between blue Cut Bridge and Billopaloola Intersection	Pavement Reconstruction	$900,000	Current program
RTA	**Snowy Mountains Hwy, Gilmore to Visy T/O**	**P2.1**	6.0	State (RTA) funded	No Specific works beyond restoration		
RTA	**Snowy Mountains Hwy Visy, T/O to Hume Hwy**	**P2.2**	34.0	State (RTA) funded	No Specific works beyond restoration		
Tumut	**Visy Access Road**	**P3**	2.13		No Specific works beyond restoration		
Tumba/FNSW	**Wondalga Rd, Wondalga to Taradale**	**P4.1**	20.6	8.8 to 11.8km	Re-alignment	$1,600,000	Current program
Tumbarumba	**RR7602 Broadleaf Park Rd Taradale to Rosewood**	**P4.2, P4.3**	9.6	Segment 80	Widen Road and Overlay - Pavement Reconstruction	$400,000	Current program
Tumbarumba	**MR284, Tumbarumba to Rosewood**	**P5.1**	21.1		No Specific works beyond restoration		
Greater Hume	**MR284, Rosewood to Carabost**	**P5.2**	13.4		No Specific works beyond restoration		
Greater Hume	**MR284, Carabost to Little Billabong**	**P5.3**	14.1	Voikins Creek Bridge Widening	1 No. Bridge Widening	$500,000	Current program
Greater Hume	**MR331, MR85 to Holbrook**	**P6**	47.5	Realignment & Construction of 2km of "Chinaman's Gap"	Extensive Cut/Fill	$3,000,000	Current program
Greater Hume	**MR331, MR85 to Holbrook**	**P6**	47.5	Widening East of Chinamans Gap (15 km)	$200k per km	$3,000,000	Current program
Greater Hume	**MR331, MR85 to Holbrook**	**P6**	47.5	Bridge Widening Holbrook to Chinamans Gap	4 No. Bridges x $250k	$1,000,000	Current program
Greater Hume	**MR331, MR85 to Holbrook**	**P6**	47.5	Major Repairs (Holbrook to Chinamans Gap)	Numerous Failed Sections	$1,000,000	Current program
Greater Hume	**Coppabella Road, Plantations to MR 284**	**P7**	16		Numerous Failed Sections	$5,400,000	Current program
					Total primary network improvement works: 5 year program	**$55,477,200**	$11,095,440 annual

Appendix E: Recommended Road Works Program

SWS Logging Roads Major Works needed

Owner	Roadname	Map Reference	Link Length	Work Location	Description	Cost	Proposed Timing
	Primary Network Life Cycle Pavement Restoration				**Rate per km**		
Tumbarumba	**MR85 Jingellic to MR331**	B1.1	15.6	Pavement restoration - large scale	$150,000	$46,800	Annual average @ 2% length
Tumbarumba	**MR85 MR331 to Tumbarumba**	B1.2	35.7	Pavement restoration - large scale	$150,000	$160,740	Annual average @ 3% length
Tumbarumba	**Tumbarumba N/S Bypass - Courabyra Road**	B2	11.0	Pavement restoration - large scale			NA
Tumbarumba	**MR85 Tumbarumba to Batlow in Tumbarumba SC**	B3.1	21.6	Pavement restoration - large scale	$180,000	$116,640	Annual average @ 3% length
Tumut	**MR85 Tumbarumba to Batlow, in Tumut SC**	B3.2	14.15	Pavement restoration - large scale	$200,000	$84,900	Annual average @ 3% length
Tumut	**Batlow Bypass**	B4	9	Pavement restoration - large scale			NA
Tumut	**MR85 Batlow to Wondalga**	B5.1	13.12	Pavement restoration - large scale	$200,000	$78,720	Annual average @ 3% length
Tumut	**MR85 Wondalga to Gilmore**	B5.2	10.34	Pavement restoration - large scale	$200,000	$82,720	Annual average @ 4% length
RTA	**Snowy Mountains Hwy Gilmore to Tumut**	B6	8	Pavement restoration - large scale			NA
Tumut	**MR279, Gocup Rd, Tumut SC**	B7.1	16.63	Pavement restoration - large scale	$200,000	$133,040	Annual average @ 4% length
Gundagai	**MR279, Gocup Rd, Gundagai SC**	B7.2	17.00	Pavement restoration - large scale	$200,000	$136,000	Annual average @ 4% length
Tumut/Forests NSW	**MR278 & Bombowlee Ck Rd to Wee Jasper Rd**	P1	27.00	Pavement restoration - large scale	$220,000	$237,600	Annual average @ 4% length
RTA	**Snowy Mountains Hwy, Gilmore to Visy T/O**	P2.1	6.0	Pavement restoration - large scale			NA
RTA	**Snowy Mountains Hwy Visy, T/O to Hume Hwy**	P2.2	34.0	Pavement restoration - large scale			NA
Visy	**Visy Access Road**	P3	2.13	Pavement restoration - large scale	$250,000	$21,300	Annual average @ 4% length
Forests NSW	**Wondalga Rd, Wondalga to Taradale**	P4.1	20.6	Pavement restoration - large scale	$220,000	$181,280	Annual average @ 4% length
Tumbarumba	**RR7602 Broadleaf Park Rd Taradale to Rosewood**	P4.2, P4.3	9.6	Pavement restoration - large scale	$180,000	$69,120	Annual average @ 4% length
Tumbarumba	**MR284, Tumbarumba to Rosewood**	P5.1	21.1	Pavement restoration - large scale	$220,000	$139,260	Annual average @ 3% length
Greater Hume	**MR284, Rosewood to Carabost**	P5.2	13.4	Pavement restoration - large scale	$220,000	$88,440	Annual average @ 3% length
Greater Hume	**MR284, Carabost to Little Billabong**	P5.3	14.1	Pavement restoration - large scale	$220,000	$93,060	Annual average @ 3% length
Tumbarumba	**MR331, MR85 to Holbrook**	P6	45.7	Pavement restoration - large scale	$200,000	$274,200	Annual average @ 3% length
Greater Hume	**Coppabella Road, Plantations to MR 284**	P7	16	Pavement restoration - large scale	$150,000	$48,000	Annual average @ 2% length
					Total primary network: Annual Restoration of failed pavements	**$1,991,820**	
	Other works needs - no apparent funding source						
Tumba	**RR7603 Elliott Way Paddy's River to Second Powerline Road**	**S7**	21.7	Entire Stretch	Widen Road and Overlay	$3,038,000	When able