Appendix 2

FIVE YEAR REGIONAL TRANSPORT PLAN

FOR THE TIMBER INDUSTRY

IN THE WA GREAT SOUTHERN TIRES REGION

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For the WA Great Southern TIRES Group

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FOREWORD

Albany is the regional centre in the Great Southern Region of Western Australia. It also provides the port and associated services for the export of grain and wood chips from the region.

The Great Southern Region TIRES region is the timber production area in the four local government areas in the southern portion of the Great Southern Region. The transport task for the timber industry essentially revolves around the chipping of plantation logs (either at a centralised site or in-field) and the export of the wood chips through the Albany port. The four local government areas in the region are Albany, Plantagenet, Denmark and Cranbrook.

The plantation timber industry is a new industry to the region. These plantations have replaced the more traditional pastoral and agricultural land-uses. This change in land-use is having a significant impact on the local communities in terms of the use of the local access roads.

The four Councils together with the industry and the Department of Main Roads and under the leadership of the Great Southern Regional Development Board have prepared this Transport Plan to provide a focus for the development of a road network to accommodate this change in road use from low intensity pastoral and agriculture industries to intensive timber use.

The plan identifies a number if high priority infrastructure projects, including:

- The upgrading of a number of regional roads including Spencer Road and Stockyard Rd/Martagallup Road; and
- The upgrading of a number of local roads in each of the local government areas that carry high tonnages of timber logs; and
- The construction of bypasses to Albany and Mount Barker to improve transport efficiency and reduce the impact of heavy haulage on the two towns.

The Plan has been prepared based on assumptions made as to Commonwealth, State and Council funding and to contributions made by the timber industry. It reflects a commitment from the three levels of government and the private sector to develop and maintain a road system that supports a sustainable plantation timber industry in the region.

Without adequate funding for a well-managed road system, the industry will impact negatively on the local communities and in the long term lose its sustainability. The Plan reflects a commitment from the three levels of government to ensure that this does not happen.

The draft plan has the support of the four Councils and the State Government and is now used to gain the support of the Commonwealth Government before being released for public comment.

1. THE GREAT SOUTHERN TIRES REGION

1.1 Defining the Region

The Great Southern TIRES Region is defined as the plantation timber harvesting area within the four local government areas of Albany, Denmark, Plantagenet and Cranbrook, located at the southern part of the Great Southern Region. Each of these local government areas has a vibrant community comprising people from both town and rural areas. The region is shown in Figure 1.1.

The predominant industry within the region is plantation timber production, mainly Tasmanian Bluegum, which are chipped for exporting to Japan through the Albany Port. There has been significant growth in the planting of timber within the region over the last ten years that will be harvested over the next ten years. All the timber will be chipped within the region and transported by either road or rail to the Albany Port for export.

1.2 Communities in the Region

The largest town in the region is Albany, which serves as the regional centre. Other towns include Denmark, Mount Barker and Cranbrook. The population of each town is shown in Table 1.1.

Table 1.1: Population of Main Towns

Town	Population	Percentage
Albany	30,279	77%
Denmark	4,200	11%
Mount Barker	1,725	4%
Cranbrook	320	1%
Non-town areas	2,783	7%
Total	*39,307*	*100%*

Source: Western Australian Tourism Commission 2004

Albany

Albany is a thriving multicultural city with many attractions. Historically, Albany was a major whaling station and shipping port. Since the whaling industry ceased in 1978, whale watching has become a major pastime in Albany. Winner of the WA Top Tourism Town award in 2000, Albany is one of Western Australia's top tourist destinations.

Albany's industries include pastoral, agriculture, plantation timber, port and shipping services, aquaculture and fishing. The area caters for many different holiday adventures, which include fishing, canoeing, boat cruises, whale watching, wildflower viewing, coach and off-road tours, scuba diving, sailing and hiking.

Figure 1.1: Map of the Great Southern TIRES Region

Albany boasts approximately fifty buildings of historical charm, most being used as museums, art and craft galleries or restaurants. Albany is important in West Australian history, as it was the first European settlement in the State.

Denmark

Denmark, established in 1895, is located on the Denmark River, 45 minutes west of Albany. Denmark has a great diversity of population, making for a huge variety of interests/occupations. With tourism being a major industry, many people have developed lifestyles combined with various cottage industries to cater for tourists.

The main local industries include – tourism, viticulture, horticulture, beef/dairy/sheep/pig/tree farming, cottage industries and agriculture. The area is also famous for its wildflowers, birds and fauna. There are also many wineries in the surrounding area.

The Denmark area boasts many national parks, among them the Mt Lindesay and William Bay National Parks. Unique forest and wetland areas have been recognised at a national level by inclusion on the 1996 Australian Heritage Commission's Register of the National Estate.

Mount Barker

Mount Barker, 45 minutes' drive northwest of Albany was once known for its apples. Today it is involved in sheep and cattle farming with significant timber plantations and is famous for its wildflowers and local wineries.

It is situated in the centre of the Great Southern Wine Region, where all major grape varieties are grown. Mount Barker is an ideal holiday centre with ample

shopping and recreation facilities within easy reach of the spectacular southern coastline, Albany, Denmark, and the Stirling and Porongurup Ranges.

Cranbrook

Cranbrook is about an hour's drive north of Albany, and 10 kilometres from the Stirling Range National Park. Cranbrook is in a rich agricultural farming area, deriving its main income from sheep, wool and grain. More recently vineyards have been established in the Frankland area. The district is known for its wildlife and wildflowers, arts and crafts, and water-based recreational activities.

1.3 The Region's Timber Industry

The timber industry is now primarily based on Tasmanian Bluegum (*eucalyptus globulus*) plantations. Planting commenced in the late 1980s. Native forests and softwood plantations account for a very small proportion of timber production in the region. In the short to medium term, most of the production from the Bluegum plantations will be processed into woodchips for export to overseas pulp and paper manufacturing plants.

There are a number of companies involved in the industry. They include Australian subsidiaries of Japanese consortia and, large Australian investment management companies. Some farmers also grow trees under contract to these companies. Most have either leased or sold their land to the plantation companies.

The Bluegum plantation development is concentrating in a 30-50 km crescent below the 600 mm rainfall isohyet that extends from South West into the Great Southern to the coast some 60 km to the north east of Albany. More than 50 percent of the plantations in Great Southern are less than 50 km from Albany.

Recent studies indicate the long-term sustainable plantation area in the Great Southern will be approximately 100,000 ha. The potential plantation represents about 20 percent of suitable cleared agricultural land in the region. Current plantings are probably in the order of 50-60 percent of the developable area.

Supporting infrastructure is being developed. A stationary woodchip mill commenced operations in 2001 on the Mirambeena Industrial Estate 20 km to the north of Albany. It is owned and operated by the Albany Export Plantation Company (APEC). Woodchips are transported to the port by rail from the mill. At the port a new berth has been constructed and a ship loader and stockpiling facilities are operating. There is adequate capacity at the new berth to enable other companies to establish similar facilities.

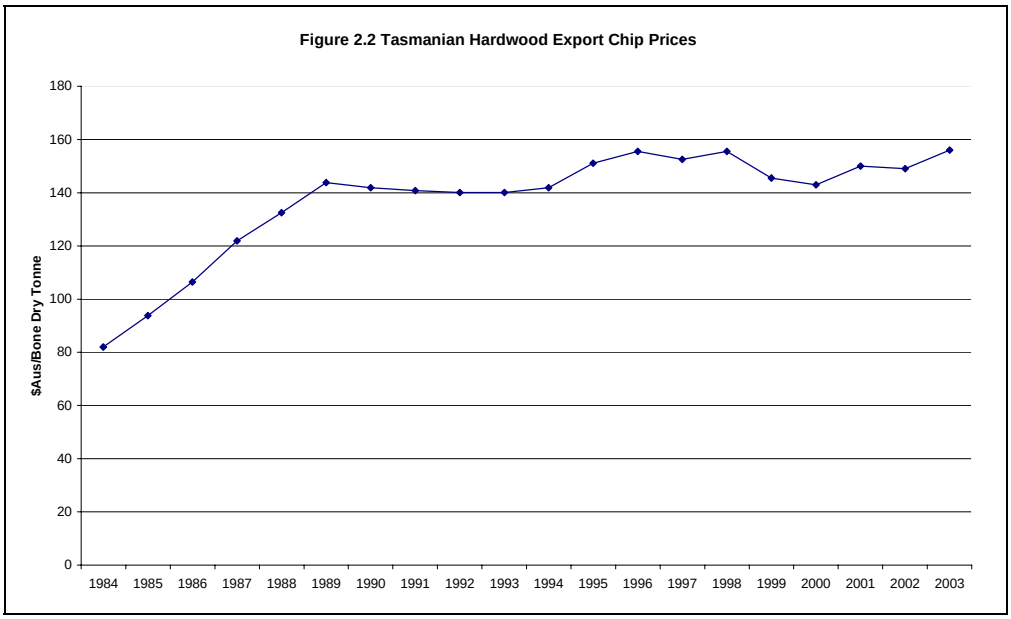
Woodchip exports commenced in 2001/02, with shipments of approximately 71,000 t. Production will rise sharply in the short term as plantations reach maturity. The TIRES reports (1998, 2001) project production to plateau in 2008 at about 2.5 mtpa. Longer term production levels will depend on yields, markets and patterns of replanting, among other factors. Based on these estimates, the value of hardwood chip exports would be about $210 million per annum (based on current fob values of about $84 t log equivalent). This would generate a direct increase in Gross Regional Product of approximately $100 million representing a 27 percent increase in the contribution from the agriculture, forestry and fishery sector (GRP in 2001 of $366 million).

The main market for hardwood chips is Japan[1]. Other markets include Korea, Taiwan and Indonesia. In 2002, Australia was the largest exporter to Japan. The other major competitors were South Africa and Chile as well as a number of smaller exporters (Wood Resources International 2002).

Substitution of plantation timber sources for native forest sources of hardwoods has buoyed demand. However, the surge in planting in various countries including Australia could lead to an over supply of hardwood chips on world markets. Japan is also increasing its imports from Japanese subsidiaries in overseas countries. This is expected to exceed 2 bdmt by 2010, which would reduce the available market for Australian owned companies without affiliations with Japanese subsidiaries.

Figure 1.2 shows the changes in hardwood woodchip prices since 1984 for bone dry unit tonnages[2]. The graph shows that prices rose significantly from 1984 to 1989, but have stabilised since then, fluctuating in a band between $140-160 per tonne (bdu) from 1989 to 2003.

Figure 1.2: Hardwood Chip Prices



Further value adding could occur in the plantation industry. Timber 2020 have estimated the uncommitted Bluegum plantation resource will increase to approximately 2 million cubic metres by 2008. The following value added projects are being investigated by potential investors: kraft pulpmill for development in Plantagenet Shire; an engineered strand board plant for Albany; a biomass power plant based on plantation wastes; production of timber veneers and the export of log billets (Timber 2020 2002).

[1] Comparative figures for 2000 show Japan importing 11.6 bdmt. Taiwan and Korea each imported about 600-650,000 bdmt while Indonesia imported 250,000 bdmt (Neilson, Forestweb 2000).

[2] The bone dry unit weight is approximately 50% of the log weight (ANU Forestry 1997).

1.4 The Purpose of the Plan

This strategic transport plan for the Great Southern TIRES Region is prepared for local government and the timber industry. This industry will have the greatest impact on the region's transport infrastructure both now and in the future. It is imperative that a plan be developed with the support of all the stakeholders to ensure that the highest priority projects are identified and funded.

The plan comprises a number of key elements namely:

- Quantification of the transport task;
- Definition of the transport infrastructure that will support the transport task;
- Transport infrastructure priorities;
- An economic plan; and
- A financing plan.

The information used for preparing the plan has been derived from a number of publications and studies and they are outlined at the end of the plan. The primary purpose of the plan is to document the agreement between stakeholders on what the issues are for the transport of timber products, the impact that it will have on local government road infrastructure and the priorities for investment.

2. TIMBER INDUSTRY TRANSPORT ISSUES

2.1 Introduction

GHD (2002) estimated that approximately 60 percent of the woodchips produced would originate from plantations to the north and north west of Albany (serviced by the railway and Albany Highway), 38 percent to the north east of Albany (entering Albany via Chester Pass Road) and about 2 percent from coastal western areas (via the South West Highway).

The four main timber companies operating in the region are APEC (Albany Export Plantation Company), Great Southern Plantations, Timbercorp and ITC (Integrated Tree Cropping). Only APEC has developed a fully integrated log haulage, chipping and woodchip transport system with the establishment of a woodchip mill at Mirambeena off Down Road and a rail connection to the main southern rail line. Significantly, Great Southern Plantations has reached agreement with APEC for their timber to be toll chipped at their Mirambeena mill and transported to the port by rail.

The other two companies are evaluating three main harvesting/transport options. These include:

- infield chipping and direct road transport of woodchips to the port;
- delivery to the APEC woodchip mill at Mirambeena for toll chipping and rail haulage to the port, similar to Great Southern; or
- development of additional stationary chipping mills probably adjacent to the main railway line and rail haulage of woodchips to the port. This option is unlikely without government financial support.

These companies appear to be favouring the first option; however, this may change depending on costs.

A number of issues are emerging as the timber industry develops. These include:

- The impact on local roads when the plantations are harvested, keeping in mind that the yield from timber (tonnes per hectare) over a ten year period is approximately six times that of grain and 150 times that of sheep and cattle.
- All of the timber will be transported to the port and a significant proportion will be by road. There will be a significant impact of the heavy road haulage on the Albany town community.
- There will also be an impact on the main highways, particularly Muirs Highway, Chester Pass Road and Hassells Highway, which collect the timber haulage from the local roads and provide access to either the Mirambeena woodchip mill or the port. These highways have not been designed for the intense timber haulage and the potential conflict with other road users, particularly tourists.

2.2 Impact of Heavy Vehicle Haulage on Local Roads

Haulage of logs and woodchips will be conducted on lower standard roads in the region. This problem has been addressed in various TIRES reports and a pattern of haulage is emerging as the timber companies plan the harvesting of their plantations. The harvesting is on a ten year cycle and once a company decides on its wood chipping arrangements, the logistics for the transport task including the likely tonnage and the transport route can be reliably predicted.

Logs and woodchips will be hauled throughout the year including the winter period when road subgrades may be saturated. Heavy usage during these periods could cause substantial structural damage to lower standard roads. This contrasts to the grain industry where the transport is within a narrow seasonal band and most often during a dry time of the year. The timber haulage will have a much greater impact on the local road system than the grain industry or any other industry in the region.

2.3 The Impact of Heavy Road Haulage in Albany

The growth of heavy vehicle traffic in Albany is a major issue for the community, because of its impacts on traffic congestion, urban environmental amenity (caused by emissions and noise) and safety. As in other provincial port cities in Australia, there is a growing imperative to control the growth of heavy vehicle traffic in built-up areas and divert, where feasible, heavy freight to rail.

GHD (2002) evaluated the economic feasibility of developing an 'inland port' at Mirambeena to haul freight to Albany by rail. A primary issue was the additional haulage distance for grain from the north east and GHD concluded the inland port would not be economically viable.

Nevertheless, consideration has more recently been given to the construction of a ring road that would divert heavy traffic to the port from Hanrahan Road and minimise the environmental impact on Albany. The proposal is to construct the ring road in three stages, with the first stage being between Chester Pass Road and Albany Highway.

With the decision by Great Southern to chip their timber at APEC's mill at Mirambeena, the WA Government has agreed to fund the first stage of the ring road. The funding status of the other two stages of the ring road is not clear at this stage, however, when completed it will become an significant element of an integrated land-use transport strategy to accommodate the future growth of Albany.

2.4 Impact of Heavy Vehicle Haulage on State Highways

The region's highways play an important role for not only the timber industry but also the tourist and grain industries. The use of these roads by both heavy haulage and tourist vehicles is a major safety concern.

Consideration needs to be given to additional investment in particularly the Muirs Highway, Chester Pass Road and Hassells Highway to widen the seal and provide passing opportunities. Additional pavement strengthening is also required to accommodate the intense heavy loading of the timber haulage vehicles.

3. THE TIMBER INDUSTRY TRANSPORT TASK

The freight task is divided into six timber catchments areas within the region, described as follows and shown in Figure 3.1.

Zone A – Muirs Highway catchment;
Zone B – Albany Highway catchment north of Mt Barker;
Zone C – Albany Highway catchment south of Mt Barker;
Zone D – South Coast Highway west of Albany;
Zone E – Chester Pass Road catchment; and
Zone F – Hassells Highway catchment east of Albany.

Figure 3.1 shows the location of the six zones and Table 3.1 shows the estimated area that has been cultivated between 1994 and 2001 and the annual road haulage task (either as logs or chips) that will be required to harvest the plantations in each zone.

Table 3.1: The Transport Task

	Area Planted between 1994/2001, hectares	**Forecast Average Annual Road Tonnage 2004/2011**
Zone A	25,911	555,231
Zone B	8,966	192,139
Zone C	26,593	569,842
Zone D	1,671	35,798
Zone E	4,500	96,435
Zone F	17,558	376,242
Total	*85,199*	*1,825,687*

Note: These estimates are based on a yield of 150 tonnes per hectare

There will be two subsets of the transport task depending on where the logs are chipped for export through the Albany port. They will either be chipped at the APEC mill at Mirambeena or in-field. Those that are chipped in-field will be transported by road for the entire journey to the port whilst those that are chipped at Mirambeena will be transported as logs by road to Mirambeena and thence as chips by rail to the port.

The expected break down of the transport task is summarised in Table 3.2.

Figure 3.1: Location of Each Plantation Zone

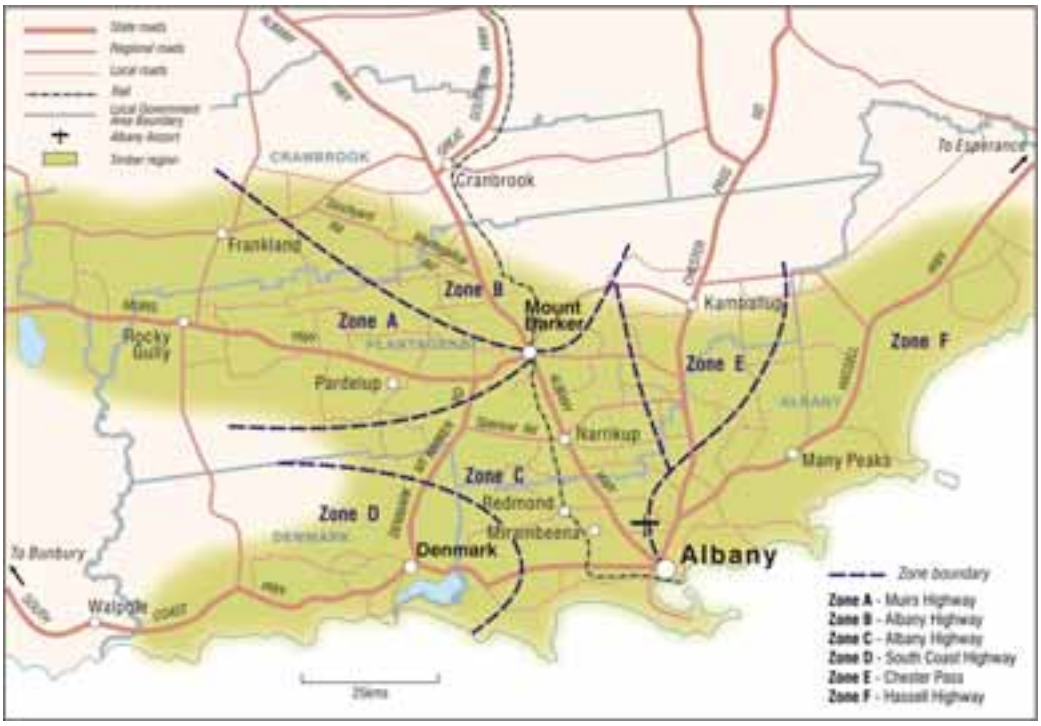


Table 3.2: Breakdown of the Transport Task

	Average Annual Tonnage		
	Chipped On-site and Transported by Road to the Port, tonne pa	**Transported by Road to Mirambeena for Chipping, tonne pa**	**Total**
Zone A	197,253	357,978	555,231
Zone B	42,373	149,766	192,139
Zone C	273,232	296,610	569,842
Zone D	35,067	731	35,798
Zone E	86,937	9,497	96,435
Zone F	178,989	197,253	376,242
Total	*813,852*	*1,011,835*	*1,825,687*
	45%	*55%*	

4. THE TRANSPORT NETWORK

4.1 Introduction

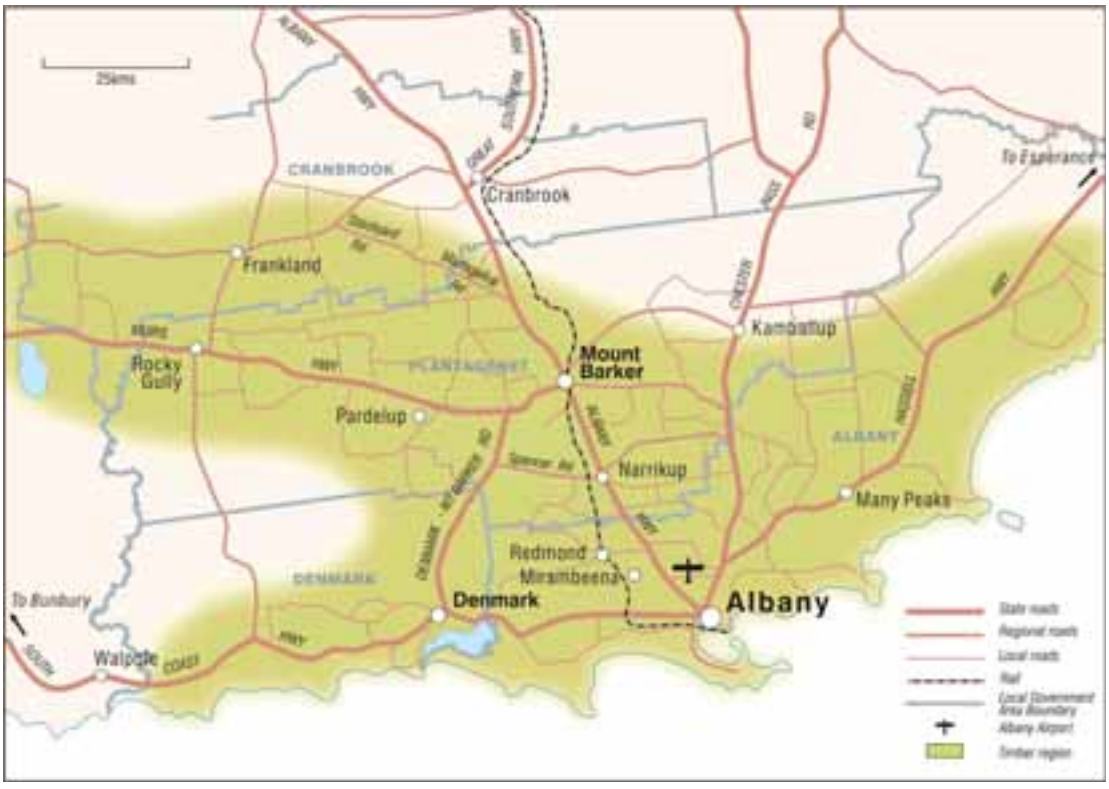
The road transport network providing access to the APEC chipping mill at Mirambeena or the Albany Port for the timber industry is summarised in Table 4.1 and shown in Figure 4.1. Not all the local roads are shown in the figure.

The State Roads are the responsibility of the State Government, whilst the Local Roads are the roads providing access to the various plantations and the responsibility of the Councils. The Regional Roads are those multi-user local roads connect the Local Roads with the State Roads. They include such roads as Spencer Road, Martagallup Road and Stockyard Road. They are the responsibility of the Councils although the State provides financial assistance.

Table 4.1: Road Infrastructure Servicing the Timber Industry, km

	Road Length, km				
Road Class	**Albany**	**Cranbrook**	**Denmark**	**Plantagenet**	**Total**
State	194.01	8.96	92.99	144.19	440.15
Regional	0	109.52	0	118.36	227.88
Local	498.84	349.03	164.03	570.76	1,582.66
Total	*692.85*	*467.51*	*257.02*	*833.31*	*2,250.69*

Figure 4.1: The Transport Network



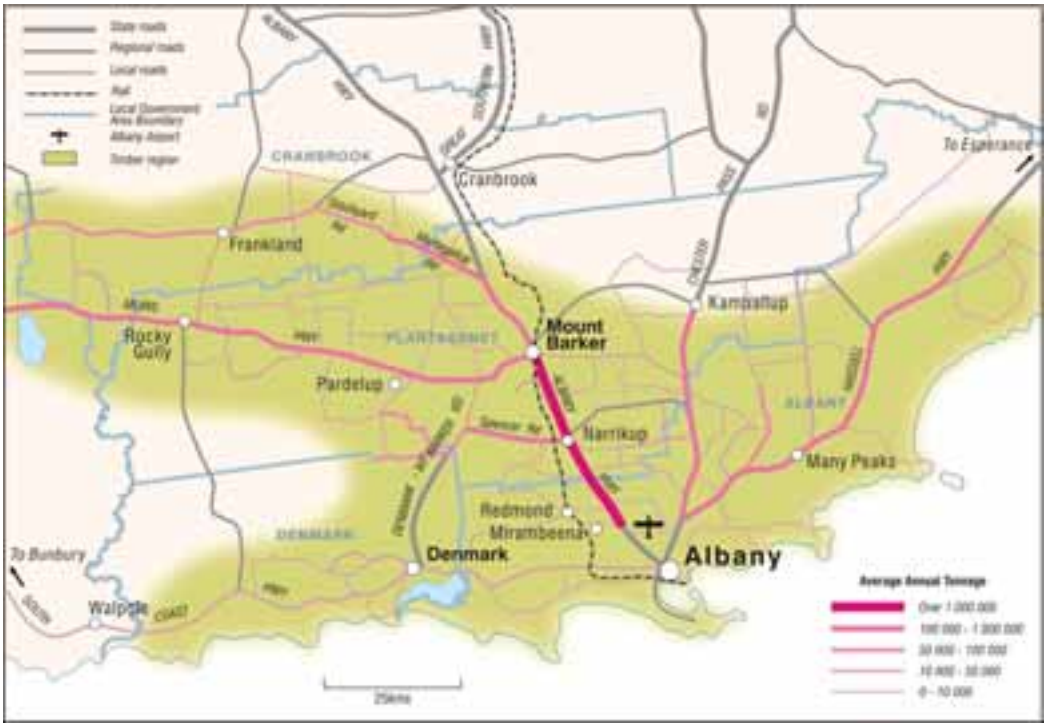
4.2 The Impact on the Road Network

The estimated impact of the 2004/2011 harvest on the road network is summarised in Table 4.2 and shown in Figure 4.2. This figure shows the accumulated tonnage on the State Roads that increases with proximity to the Albany Port.

Table 4.2: Accumulated Annual Tonnage by Road Class

Class	Tonne.km	% Tonne.km	% Length
State	3,021,016	48%	20%
Regional	549,771	9%	10%
Local	2,761,429	44%	70%
Total	*6,332,216*		

Figure 4.2: Cumulative Tonnage Expected 2004/2011



4.3 The Impact on the Rail Network

The rail link that is relevant to the transport task for the timber industry is the 20km section between Mirambeena (APEC's chipping mill) and Albany Port. The access road to the mill (Down Road) plant has been upgraded and a spur line to the main southern railway line constructed. Berthing infrastructure has also been provided at the port to handle the loading of wood chips transported by rail.

The transport logistics are working well and no further infrastructure investment to support the rail operation is identified in the strategic plan although some consideration may need to be given to passing loops to allow two-way rail movements.

5. THE INFRASTRUCTURE PLAN

The transport infrastructure plan comprises a number of components, namely:

- A list of the highest priority projects in the region based on the forecast loading by timber haulage and the condition and standard of the existing roads; and
- A program of maintenance needed to maintain the infrastructure network in a serviceable condition appropriate to the function of the road.

The profile of the Infrastructure Plan is summarised in Table 5.1 and represents a total value of $41,410,000 including $12,910,000 for regional and local roads.

The highest priority infrastructure priorities are summarised in Tables 5.2. Detailed scopes of works are included as Appendix A. Appendix B shows the relationship between the priority and the forecast tonnages on each road.

These roads are not the only roads in the region that will require upgrading over the planning period, however they represent the highest priority based on the forecast timber tonnages. These other roads will be funded from outside the funding commitments made in the plan.

The maintenance requirements are summarised in Table 5.3, which represents the costs attributed to timber haulage. Whilst it would represent a high proportion of the maintenance costs required for the local and to a lesser extent the regional roads, it is only part of the funding needed to maintain the State Roads where other commodities such as grain are hauled by road to the port.

The location of the projects is shown in Figure 5.1.

Table 5.1: Profile of the Plan

Class	Restore to Existing Standard	Upgrade to Higher Standard on Existing Alignment	Upgrade to Higher Standard with Realignment	New Route	Total
State Road					
Length, km	0	5.6	4.7	11.2	21.5
Cost, $	$0	$10,900,000	$5,100,000	$12,500,000	$28,500,000
Regional Road					
Length, km	0	27.1	17.2	2.5	46.8
Cost, $	$0	$1,110,000	$4,900,000	$1,500,000	$7,510,000
Local Road					
Length, km	73	76.7	0	0	149.7
Cost, $	$1,310,000	$4,090,000	$0	$0	$5,400,000
Total					
Length, km	*73*	*109.4*	*21.9*	*13.7*	*218*
Cost, $	*$1,310,000*	*$16,100,000*	*$10,000,000*	*$14,000,000*	*$41,410,000*

Table 5.2: The Infrastructure Plan

Priority	Class	Road Name	Project No	Cost, $
1	State	Albany Ring Road Stage 1	ALB5	$7,500,000
1	Regional	Spencer Rd	PL01	$6,400,000
1	Regional	Stockyard/Martagallup Rd	CRAN1/PL03	$1,110,000
1	Local	Palmdale Road	ALB1	$650,000
		Total Priority 1		*$15,660,000*
2	Local	Blue Lake Road	PL04	$420,000
2	Local	Springs Road	PL06	$600,000
2	Local	Mettlers Lake Road	ALB2	$130,000
2	Local	Pfeiffer Road	ALB3	$250,000
2	Local	Noobijup Road	CRAN2	$160,000
2	Local	Jackson Road	PL05	$650,000
2	State	Mt Barker Bypass	PL09	$5,000,000
		Total Priority 2		*$7,210,000*
3	Local	Deep Creek Road	ALB4	$280,000
3	Local	St Werburghs Road	PL08	$790,000
3	Local	Scotsdale/Roberts Rd	DE2/DE5	$1,310,000
3	Local	Perillup Sth Road	PL07	$160,000
		Albany Ring Rd (Stage 2&3)	ALB6/ALB7	$16,000,000
		Total Priority 3		*$18,540,000*
		Grand Total		*$41,410,000*

Table 5.3: Maintenance 5 Year Plan

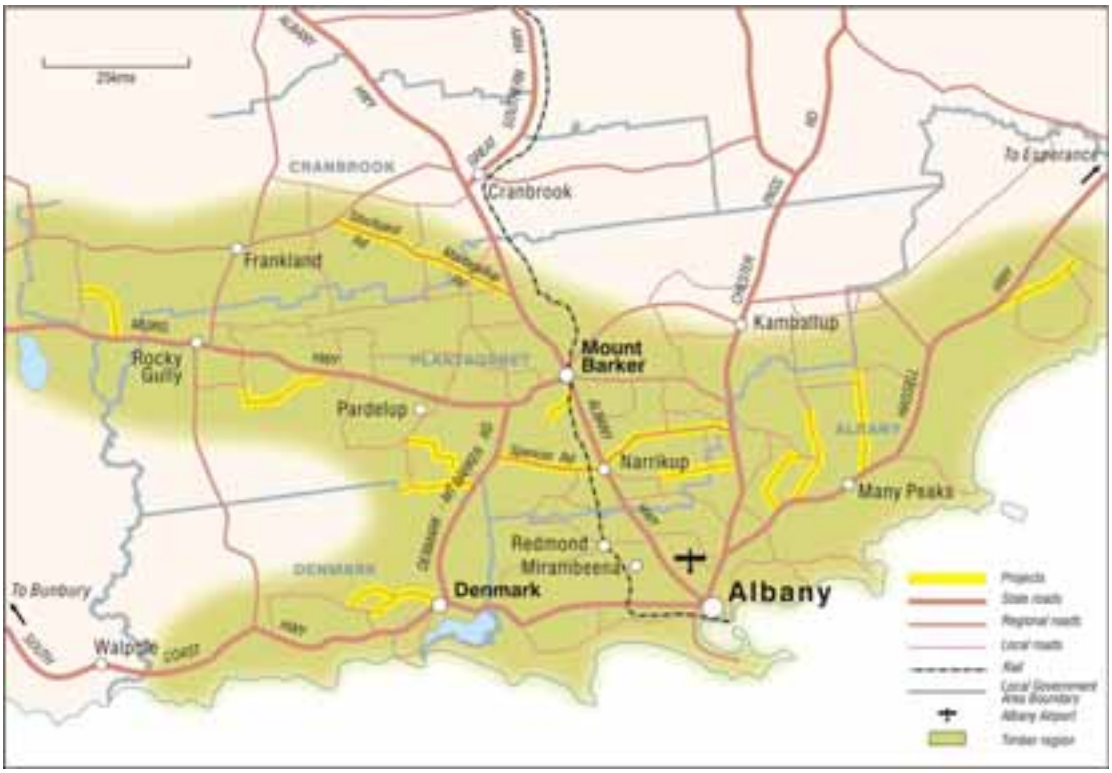
Class	Length, km	Avge Cost, $/km pa*	Cost, $
State Roads	516	$2,340	$6,041,034
Regional Roads	103	$500	$257,500
Local Roads	1,417	$500	$3,627,733
Total			*$9,926,267*

Note: * average costs are rounded off

Table 5.4: Funding by Priority

Road Priority	Total Length, km	Cost, $
1	79.8	$15,660,000
2	80.5	$7,210,000
3	57.7	$18,540,000
Total	*218*	*$41,410,000*

Figure 5.1: Location of Projects in Infrastructure Plan



6. THE ECONOMIC PLAN

6.1 Project Evaluation

A cost benefit analysis was conducted on the major projects in the plan. The analysis excluded projects where gravel surfaces will be retained (eg gravel re-sheeting, strengthening and drainage projects) and also the construction of new roads (eg bypass and link roads). The projects that were analysed are listed in Table 6.1.

Table 6.1: Projects Evaluated

Road Name	Council	Length, km	Cost, $
Spencer Road	Plantagenet	20	$4,900,000*
Martagallup/Stockyard Road	Plantagenet/Cranbrook	9.5	$1,110,000
St Werburghs Road	Plantagenet	6.3	$790,000
Jackson Road	Plantagenet	3.6	$650,000
Noobijup Road	Cranbrook	1.0	$70,000
Scotsdale Road	Denmark	17.2	$1,120,000
Total		*57.6*	*$8,640,000*

* excludes bypass of Narrikup ($1.5 million)

A conventional cost benefit analysis was conducted to compare estimated vehicle operating and time savings benefits with the expected incremental project costs. However, in the case of the Spencer Road project (excluding the town bypass), the projected benefits accruing to timber haulage vehicles of avoiding a diversion via Denbarker Road and Muirs Highway have been combined with the benefits accruing to the remainder of the traffic stream.

The results of the analysis are shown in Table 6.2 and indicate that the Spencer, Martagallup/Stockyard and St Werburghs Road projects would be economically viable at the benchmark real rate of discount of 7% per annum. When all the projects are combined the discounted benefits exceed the costs by a ratio of 1.1. Details of the economic evaluation are given in as Appendix C.

Table 6.2: Summary of Cost Benefit Analysis at 7% Discount Rate

Road Name	Council	Benefit Cost Ratio
Spencer Road	Plantagenet	1.4
Martagallup/Stockyard Road	Plantagenet/Cranbrook	1.0
St Werburghs Road	Plantagenet	1.0
Jackson Road	Plantagenet	0.8
Noobijup Road	Cranbrook	0.6
Scotsdale Road	Denmark	0.5
All Projects		*1.1*

The sensitivity of the cost benefit ratio with the discount rate is shown in Table 6.3. At the lower rate of discount, the Jackson road project would become viable, but only the Spencer road project would remain viable at the higher real rate of discount of 10% per annum.

Table 6.3: Sensitivity Testing at 4% and 10% Discount Rate

Road Name	Benefit Cost Ratio	
	4% Discount Rate	**10% Discount Rate**
Spencer Road	2.0	1.0
Martagallup/Stockyard Road	1.6	0.7
St Werburghs Road	1.4	0.7
Jackson Road	1.1	0.6
Noobijup Road	0.9	0.4
Scotsdale Road	0.8	0.3
All Projects	*1.7*	*0.8*

6.2 Economic Assumptions

The main assumptions of the analysis are set out in Tables 6.4 and 6.5.

A number of assumptions were made in the analysis due to the lack of reliable data. These need to be reviewed when the plan is updated. Further the economic analysis has been limited to projects involving a change in surface type (eg from unsealed to sealed surface) or a major upgrade of a sealed road (eg Spencer Road). The analysis has not been applied at this stage to those projects involving gravel resheeting or minor improvements in standard to a sealed road.

Whilst the analysis permits a comparison of the economic merits of a number of projects, it is important to appreciate that all projects in the plan need to be undertaken. The transport task is critically dependent on all roads in the plan including those with low traffic volumes. When the benefits and costs for the six projects in the analysis are added, they show a net positive economic return from the plan.

Table 6.4: General Assumptions for Selected Road Projects

Road projects:	Spencer Rd	Martagallup/ Stockyard Rd	St Werburghs Rd	Jackson Rd	Noobijup Rd	Scotsdale Rd
Capital cost $'000	$4,900	$1,110	$790	$650	$70	$1,112
Project life (years)	30	30	30	30	30	30
Residual value at end of period	Nil	Nil	Nil	Nil	Nil	Nil
Period of construction (years)	3	2	1	1	1	3
Real discount rate % pa	7% (4%, 10%)*	7% (4%, 10%)*	7% (4%, 10%)*	7% (4%, 10%)*	7% (4%, 10%)*	7% (4%, 10%)*
Benefits commence in year	4	3	2	2	2	4
AADT	210	265	55	55	20	100
Traffic composition:						
Commercial cars	30%	30%	30%	30%	30%	30%
Rigid trucks	2%	5%	5%	5%	5%	5%
Semi-trailers	5%	7%	7%	7%	7%	7%
Combination vehicles	4%	10%	11%	11%	8%	8%
Traffic growth % pa	3%	3%	3%	3%	3%	3%

* ( ) analysis incorporates testing at the upper and lower bound limits for real discount rate.

Table 6.5: Comparative Assumptions; Base and Project Cases for Selected Road Projects

	Spencer Rd		Martagallup/Stockyard Rd		St Werburghs Rd	
Parameter:	**Base**	**Project**	**Base**	**Project**	**Base**	**Project**
Model road state	Sealed <=5.8m	Sealed <=9.1m	Sealed <=5.8m	Sealed <=9.1m	Paved >=4.5m	Sealed <=7.0m
Pavement type	Flexible	Flexible	Flexible	Flexible	Unpaved	Flexible
Surface type	Sprayed Surf seal	Sprayed Surf seal	Sprayed Surf seal	Sprayed Surf seal	Unsurfaced	Sprayed Surf seal
Terrain	Undulating	Undulating	Undulating	Undulating	Undulating	Undulating
Sealed shoulders	N	Y	N	Y	na	Y
Roughness	100	40	106	40	na	40
Curvature	Pred curving	Pred. straight	Pred curving	Pred curving	Pred curving	Pred curving
Safe free speed kph	80	100	80	100	70	100
Project length km	20	18	9.5	9.5	6.3	6.3
Generated traffic vpd	na	na	na	na	na	11
Potential stock damage	N	N	N	N	Y	N
	Jackson Rd		**Noobijup Rd**		**Scotsdale Rd**	
Parameter:	**Base**	**Project**	**Base**	**Project**	**Base**	**Project**
Model road state	Paved >=4.5m	Sealed <=7.0m	Paved >=4.5m	Sealed <=7.0m	Sealed <=7.0m	Sealed <=6.4m
Pavement type	Unpaved	Flexible	Unpaved	Flexible	Flexible	Flexible
Surface type	Unsurfaced	Sprayed Surf seal	Unsurfaced	Sprayed Surf seal	Sprayed Surf seal	Sprayed Surf seal
Terrain	Flat	Flat	Undulating	Undulating	Undulating	Undulating
Sealed shoulders	na	Y	na	Y	N	Y
Roughness	na	40	na	40	120	40
Curvature	Pred. straight	Pred. straight	Pred curving	Pred curving	Pred curving	Pred curving
Safe free speed kph	70	100	70	100	80	100
Project length km	3.6	3.6	1	1	17.2	17.2
Generated traffic vpd	na	11	na	4	na	N
Potential stock damage	Y	N	Y	N	N	N

7. THE FINANCIAL PLAN

7.1 Funding Needed for the Plan

The financing of the strategic plan is based on contributions from all three levels of government and the private timber sector. The funding needed to implement the plan over the 5 years between 2004/05 and 2008/09 is shown in Table 7.1. This funding schedule is based on funding all the projects in the Infrastructure Plan with the exception of Stages 2 and 3 of the Albany Ring Road. Only $2,500,000 of the funding needed for these 2 stages is included in the Financial Plan. It is envisaged that the remainder will be funded subsequent to 2008/09.

The five year period is divided into 2 periods. The first is the funding committed for the current 2004/05 financial year whilst the second is the four year period corresponding to the period of the Commonwealth Roads to Recovery Program (2004/05 – 2008/09). A third period will be introduced in the first review of the plan to add another five years to the planning period.

Table 7.1: Five Year Financial Plan

	Funding, $ million		
	2004/05	**2005/06-2008/09**	**Total**
Projects			
State Road	$0	$15,000,000	$15,000,000
Regional Road	$1,122,700	$4,490,800	$5,613,500
Local Road	$1,567,300	$5,729,200	$7,296,500
Total	*$2,690,000*	*$25,220,000*	*$27,910,000*
Maintenance			
State Road	$1,208,207	$4,832,827	$6,041,034
Regional Road	$51,500	$206,000	$257,500
Local Road	$709,077	$2,918,656	$3,627,733
Total	*$1,968,784*	*$7,957,483*	*$9,926,267*

7.2 Sources of Funding

There are four sources for the funding of the plan. They are:

- Commonwealth Government through the Roads to Recovery Program (the formula allocation and the special regional development fund);
- State Government though the Regional Road Group Fund, Special TIRES Appropriations and the Main Roads Fund;
- Council sources through their rate revenue, Financial Assistance Grants and developer contributions; and
- Private Sector (the timber companies) restoring single user local roads following any damage as a result of the transport of the timber logs.

The various financial contributions are shown in Table 7.2.

Table 7.2: Financial Contributions

	Funding, $ million				
	Common-wealth	**State**	**Council**	**Private Sector**	**Total**
Projects					
State Road	$0	$15,000,000	$0	$0	$15,000,000
Regional Road	$3,883,500	$1,300,000	$430,000	$0	$5,613,500
Local Road	$4,161,500	$2,350,000	$785,000	$0	$7,296,500
Total	*$8,045,000*	*$18,650,000*	*$1,215,000*	*$0*	*$27,910,000*
	29%	*67%*	*4%*	*0%*	*100%*
Maintenance					
State Road	$0	$6,041,034	$0	$0	$6,041,034
Regional Road	$0	$193,125	$64,375	$0	$257,500
Local Road	$0	$0	$2,419,358	$1,208,375	$3,627,733
Total	*$0*	*$6,234,159*	*$2,483,733*	*$1,208,375*	*$9,926,267*
	0%	*63%*	*25%*	*12%*	*100%*
Total Plan	*21%*	*66%*	*10%*	*3%*	*100%*

The State maintenance has been estimated at a rate of 0.33 cents per tonne.km, which is the estimated variable maintenance cost for the entire road freight to the port from the Great Southern Region[3].

APEC has an agreement with the Councils in the region to restore those single user unsealed roads that it damages during the haulage of their timber logs. This cost translates to about 35 cents per log tonne. APEC will impose a similar levy on Great Southern for the logs that are transported to its chipping facilities at Mirambeena. The funding for this work is recorded in Table 7.2 as the private sector contribution to the maintenance plan.

The private sector contribution to the plan accounts for 12% of the total maintenance budget (including State Roads) and about half the Councils' contribution. Opportunities will be sought to encourage the other two companies to make similar contributions.

In addition to this direct funding contribution, the timber companies have also installed Central Tyre Inflation (CTI) technology to their heavy haulage vehicles. This technology allows drivers to lower their tyre pressures when hauling over low standard roads. The cost of the CTI equipment is about $20,000 but is less than the additional road damage that would be caused if not installed.

[3] Based on an annual maintenance budget of $10.8 million of which 50% is attributed to variable costs, 45% of grain transport by road and average haulage lengths of 45km for timber and 70km for grain.

7.3 Funding Assumptions

The financial plan assumes that Councils will allocate a certain percentage of their Commonwealth Roads to Recovery funding to the plan. The assumptions used in assessment are shown in Table 7.3

Table 7.3: Funding Assumptions – the Roads to Recovery Funding

Council	R2R Allocation over 4 years, $	Allocation to Plan	
		%	$
Albany	$3,300,000	20%	$660,000
Plantagenet	$1,370,000	40%	$548,000
Denmark	$950,000	10%	$95,000
Cranbrook	$1,590,000	30%	$477,000
Total	*$7,210,000*		*$1,780,000*

The financial plan assumes that the State will fund the Mount Barker Bypass and the Albany Ring Road outlined in the plan and make a significant contribution to Regional and Local Roads through the Regional Road Groups and special funding for TIRES projects. The allocations to be allocated to the plan expressed as a percentage of the average of the three years 2002/03 – 2004/05 are shown in Table 7.4. The proposed matching contribution from Councils own sources are shown in Table 7.5.

An important point of consideration for Councils is their need to fund roads within the TIRES region for reasons other than timber haulage or roads that are outside the defined region. Their commitment to the allocation of their expected Regional Road Group and TIRES funding and the Commonwealth Roads to Recovery funding to the Plan needs to reflect these broader demands on their resources.

Table 7.4: Funding Assumptions – State Funding for Regional and Local Roads

Council	Avge RRG+TIRES Funding 2002/05, $ pa	Allocation to Plan, $	Percentage
Albany	$870,000	$1,500,000	34%
Plantagenet	$710,000	$1,200,000	34%
Denmark	$250,000	$450,000	36%
Cranbrook	$350,000	$500,000	29%
Total	*$2,180,000*	*$3,650,000*	*33%*

Table 7.5: Funding Assumptions – Council Contributions

Council	State Contribution	Council Contribution	Percentage Council
Albany	$1,500,000	$500,000	33%
Plantagenet	$1,200,000	$400,000	33%
Denmark	$450,000	$150,000	33%
Cranbrook	$500,000	$165,000	33%
Total	*$3,650,000*	*$1,215,000*	*33%*

The plan has a shortfall of $6,265,000, which is expected to come from the Commonwealth special regional development fund. This would be allocated to the four Councils as shown in Table 7.6.

Table 7.6: Allocation of Supplementary Commonwealth Funding

Council	Percentage Allocation	Supplementary Commonwealth Funding
Albany	20%	$1,253,000
Plantagenet	40%	$2,506,000
Denmark	10%	$626,500
Cranbrook	30%	$1,879,500
Total		*$6,265,000*

The Plan reflects a strong commitment from the Commonwealth Government to the plantation timber industry in the Great Southern Region, namely 21% of the total value of the Plan.

However it also reflects a strong State commitment to upgrade and maintain their roads to meet the challenge, particularly the Albany Ring Road and the Mt Barker Bypass. Overall the State contribution represents 66% of the value of the Plan.

The mix of funding from the three levels of Government for the regional and local road projects is summarised in Table 7.7.

Table 7.7: Cost Sharing of the Regional and Local Road Projects

	Common-wealth	State	Council	Total
Regional Road	69%	23%	8%	100%
Local Road	57%	32%	11%	100%

8. IMPLEMENTATION OF THE PLAN

The plan has been prepared on the information that was available as of November 2004. Initiatives will emerge that will impact on the plan, such as the proposed Beacon Power Station and the Lignor timber processing plant, both to be located at Mirambeena on Down Road.

Decisions will be made on a number of projects, such as the Albany Ring Road, as the planning proceeds and the technical issues are addressed. Estimates of these projects will change that will have to be reflected in the plan.

The Steering Committee of the TIRES Group has co-ordinated the preparation of this plan. One of its first tasks will be to extend the plan to a ten year planning horizon. It will then play an ongoing role in the annual review of the plan to reflect developments within the region over the previous year such as changes in project estimates and to identify projects that should come into the plan to replace projects as they are completed.

Part of this annual review will provide a transparent audit of the actual funding provided by the three levels of governments and the private sector and the actual costs of projects undertaken by Councils.

The Steering Committee already has a representative for each of the Great Southern Development Commission, the State Department of Main Roads, the four Councils and the local timber industry. The Commonwealth as a source of funding for the plan will be invited to join the Steering Committee.

The Plan identifies $6.265 million of additional funding from the Commonwealth. This will be allocated to Councils according to the percentage of their formula Roads to Recovery allocation that they have committed to the Plan. The construction timetable for projects in the Plan will therefore not only reflect the forecast timber tonnages but also the ability of each Council to put together a package of funding from the three levels of government. The Steering Committee will assist Councils meet their obligations to the various funding agencies.

9. PARTIES TO THE PLAN

The stakeholders on the TIRES Group who are committed to implementing the Plan are:

- Albany Council;
- Cranbrook Council;
- Denmark Council;
- Great Southern Regional Development Commission;
- Plantagenet Council;
- Timber industry; and
- WA Department of Main Roads (Albany Office).

The Commonwealth is invited to nominate a representative for the Group and the Steering Committee.

The Group represents the industry and the three levels of government responsible for the provision of transport infrastructure. The plan reflects the collective view of these stakeholders on priorities for the provision of transport infrastructure.

The Plan will be subject to community consultation before being finalised.

APPENDIX A – SCOPE OF WORKS

Road Name	LGA	Class	Scope of Works	Description	Project No	Cost
Palmdale Road	Albany	Local	Stabilise pavement at failed sections	Restore to Existing Standard	ALB1a	$220,000
Palmdale Road	Albany	Local	Resheet	Restore to Existing Standard	ALB1b	$430,000
Albany Ring Road Stage 1	Albany	State	Construct priority heavy haulage route between Chester Pass Road and Albany Highway	New Route	ALB5	$7,500,000
Stockyard Road	Cranbrook	Regional	Widen formation and seal to 7.0m on straights and 7.5m on curves	Upgrade on Existing Alignment	CRAN1	$190,000
Spencer Road	Plantagenet	Regional	Realign, widen and reconstruct the western end of Narrikup Village to the Denmark Mount Barker Road. The proposed formation width is 9.5m with 7.5m wide bitumen seal	Upgrade with Realignment	PL01a	$4,900,000
Spencer Road	Plantagenet	Regional	Construction of new road to bypass the town of Narrikup	New Route	PL01b	$1,500,000
Martagallup Road	Plantagenet	Regional	Widen, reconstruct, and bitumen seal from 4.1 to 10.7 SLK (Shire Boundary). The proposed formation width will be 9.4m with 7.4m wide bitumen seal	Upgrade on Existing Alignment	PL03	$920,000
Mettlers Lake Road	Albany	Local	Resheet	Restore to Existing Standard	ALB2	$130,000
Pfeiffer Road	Albany	Local	Stabilise weaker sections	Restore to Existing Standard	ALB3	$250,000
Noobijup Road	Cranbrook	Local	Widen formation & seal to 7.0m	Upgrade on Existing Alignment	CRAN2a	$70,000
Noobijup Road	Cranbrook	Local	Clear, form & Gravel resheet	Upgrade on Existing Alignment	CRAN2b	$90,000

Road Name	LGA	Class	Scope of Works	Description	Project No	Cost
Blue Lake Road	Plantagenet	Local	Widen existing road formation to 9.0m, undertake drainage improvements and verge clearing and gravel resheet from 1.66 to 11.5 SLK	Upgrade on Existing Alignment	PL04	$420,000
Jackson Road	Plantagenet	Local	Widen, reconstruct, and bitumen seal a section of Jackson Road that is currently unsealed from 6.1 to 9.7 SLK. The proposed formation width will be 9.0m with 7.0m wide bitumen seal	Upgrade on Existing Alignment	PL05	$650,000
Springs Road	Plantagenet	Local	Widen existing road formation to 9.0m, undertake drainage improvements and verge clearing, and gravel resheet The Springs Road from 1.2 to 16.2 SLK	Upgrade on Existing Alignment	PL06	$600,000
Mt Barker Bypass	Plantagenet	State	Construct a bypass to Mount Barker linking Muirs Highway with Albany Highway north of Mt Barker	New Route	PL09	$5,000,000
Deep Creek Road	Albany	Local	Resheet	Restore to Existing Standard	ALB4	$280,000
Albany Ring Road Stage 2	Albany	State	Construct priority heavy haulage route between Albany Hwy, Sth West Hwy and Lower Denmark Rd	Upgrade on Existing Alignment	ALB6	$10,900,000
Albany Ring Road Stage 3	Albany	State	Construct priority heavy haulage route between George St and Hanrahan Road	Upgrade with Realignment	ALB7	$5,100,000
Scotsdale Road	Denmark	Local	Widening to 7.0m seal with 1.2m shoulders between from Horsley Road to McLeod Road. Stabilise pavement where necessary	Upgrade on Existing Alignment	DE2	$1,120,000
Roberts Road	Denmark	Local	Gravel Sheet and widen formation on curves to 10m	Upgrade on Existing Alignment	DE5	$190,000
Perillup Sth Road	Plantagenet	Local	Widen existing road formation to 9.0m, undertake drainage improvements, and gravel resheet Perillup South Road from 12.0 to 18.5 SLK	Upgrade on Existing Alignment	PL07	$160,000
St Werburghs Road	Plantagenet	Local	Widen existing road formation to 9.5m, undertake drainage improvements and verge clearing and construct and bitumen seal the unsealed section from 6.2 to 12.5 SLK	Upgrade on Existing Alignment	PL08	$790,000

APPENDIX B – COMPARISON OF TONNAGES WITH PROJECT PRIORITY

Road Name	LGA	Class	Total Tonnages	Road Priority	Project No	Cost
Spencer Road	Plantagenet	Regional	1,192,461	1	PL01	$6,400,000
Martagallup Road	Plantagenet	Regional	1,052,435	1	PL03	$920,000
Palmdale Road	Albany	Local	899,380	1	ALB1	$650,000
Stockyard Road	Cranbrook	Regional	773,769	1	CRAN1	$190,000
Blue Lake Road	Plantagenet	Local	587,960	2	PL04	$420,000
Springs Road	Plantagenet	Local	539,196	2	PL06	$600,000
Mettlers Lake Road	Albany	Local	422,892	2	ALB2	$130,000
Pfeiffer Road	Albany	Local	366,077	2	ALB3	$250,000
Noobijup Road	Cranbrook	Local	335,570	2	CRAN2	$160,000
Jackson Road	Plantagenet	Local	278,043	2	PL05	$650,000
Deep Creek Road	Albany	Local	265,842	3	ALB4	$280,000
St Werburghs Road	Plantagenet	Local	186,162	3	PL08	$790,000
Scotsdale Road	Denmark	Local	121,021	3	DE2	$1,120,000
Perillup Sth Road	Plantagenet	Local	92,500	3	PL07	$160,000
Roberts Road	Denmark	Local	44,174	3	DE5	$190,000

APPENDIX C – DETAILS OF ECONOMIC EVALUATION

Projects	Spencer Rd	Martagallup/ Stockyard Rd	St Werburghs Rd	Jackson Rd	Noobijup Rd	Scotsdale Rd	Total
At real discount rate of 7% pa							
Discounted capital costs	4341.7	1003.5	738.3	607.5	65.4	979.7	7736.1
Discounted benefits	5943.5	1038.8	738.9	465.7	39.4	501.5	8727.8
Net present value	1601.7	35.3	0.6	-141.8	-26.0	-478.3	991.5
Benefit cost ratio	1.4	1.0	1.0	0.8	0.6	0.5	1.1
At real discount rate of 4% pa							
Discounted capital costs	4,567.3	1,046.8	759.6	625.0	67.3	1,036.0	8,102.0
Discounted benefits	9,237.2	1,637.3	1,088.8	687.5	58.3	819.7	13,528.8
Net present value	4,666.9	590.5	329.2	62.5	-9.0	-216.3	5,423.8
Benefit cost ratio	2.0	1.6	1.4	1.1	0.9	0.8	1.7
At real discount rate of 10% pa							
Discounted capital costs	4,134.3	963.2	718.2	590.9	63.6	928.4	7,398.6
Discounted benefits	4,036.0	700.0	532.0	334.7	28.2	324.0	5,954.9
Net present value	-98.2	-263.2	-186.2	-256.2	-35.4	-604.4	-1,443.6
Benefit cost ratio	1.0	0.7	0.7	0.6	0.4	0.3	0.8

APPENDIX D - REFERENCES

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