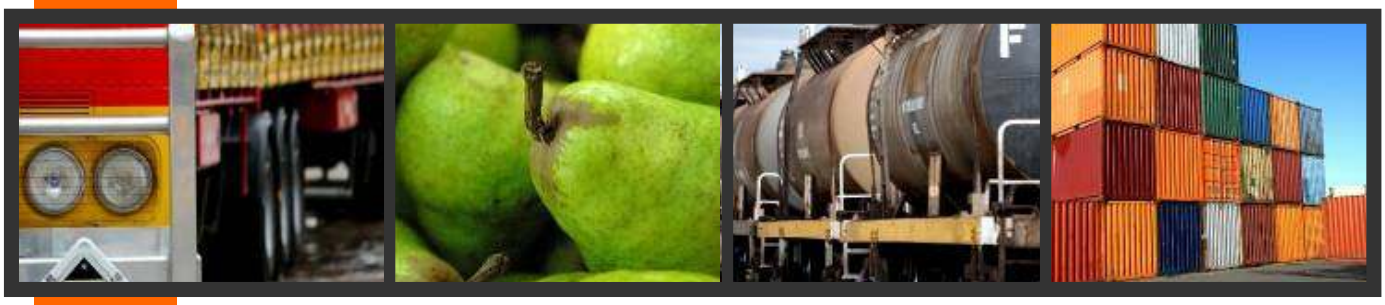
Northern Victoria Regional Transport Strategy

December 2009



Northern Victoria Regional Transport Strategy

December 23rd 2009

Prepared for:

Hume Regional Management Forum
Department of Planning and Community Development
Department of Transport

In conjunction with:

Campaspe Shire Council
Gannawarra Shire Council
Greater Shepparton City Council
Loddon Shire Council
Moira Shire Council
Strathbogie Shire Council
VicRoads, Northern and North Eastern Regions

Table of Contents

Executive Summary

This Strategy

The Northern Victoria Regional Transport Strategy forms part of the Hume Strategy for Sustainable Communities Project and aims to provide comprehensive transport planning for the defined region. This has been achieved by considering the drivers of current and future transport demands, understanding the region's current transport infrastructure and services and developing a coherent series of strategies and actions.

The need for this strategy was identified by the Hume Regional Management Forum (RMF) and the strategy was subsequently developed by the councils of Campaspe, Gannawarra, Loddon, Moira, Strathbogie and Greater Shepparton as well as VicRoads Northern and North Eastern regions.

This strategy has a 15-year focus and is intended to be reviewed every three years.

This strategy is supported by the Department of Transport and VicRoads, and has received funding from the Department of Planning and Community Development and the Department of Transport.

The strategy is consistent with the Victoria Transport Plan, Freight Futures – Victorian Freight Network Strategy (2008), National Transport Links – Growing Victoria's Economy (2007) and Infrastructure Australia – Building Australia Fund. It is important that this document links with the Hume Corridor Regional Transport Strategy as a complimentary strategy as well as with other relevant regional transport strategies.

The Northern Victoria Transport Region

The region covered by this strategy encompasses the shires of Campaspe, Moira, Gannawarra, Loddon, Strathbogie and the City of Greater Shepparton. The region covers approximately 25,000 square kilometres (11% of the state of Victoria) and has an estimated population of 155,000.

The regional economy is driven by a wide variety of agricultural activity. The Goulburn Valley and its surrounding areas are often referred to as the 'Food Bowl of Australia' and the region produces 25 per cent of the value of Victoria's agricultural produce. Dairy, horticulture and food processing are the main industries in the eastern portion of the region with service industry very important to the regional centres of Shepparton and Echuca. The economy of the western portion of the region is driven by dairying, livestock and grain farming. Throughout the region, the availability and reliability of irrigation is critical to agricultural output and hence to the overall economy.

Figure E.1 The Northern Victoria Transport Region (see page 3 for larger map)

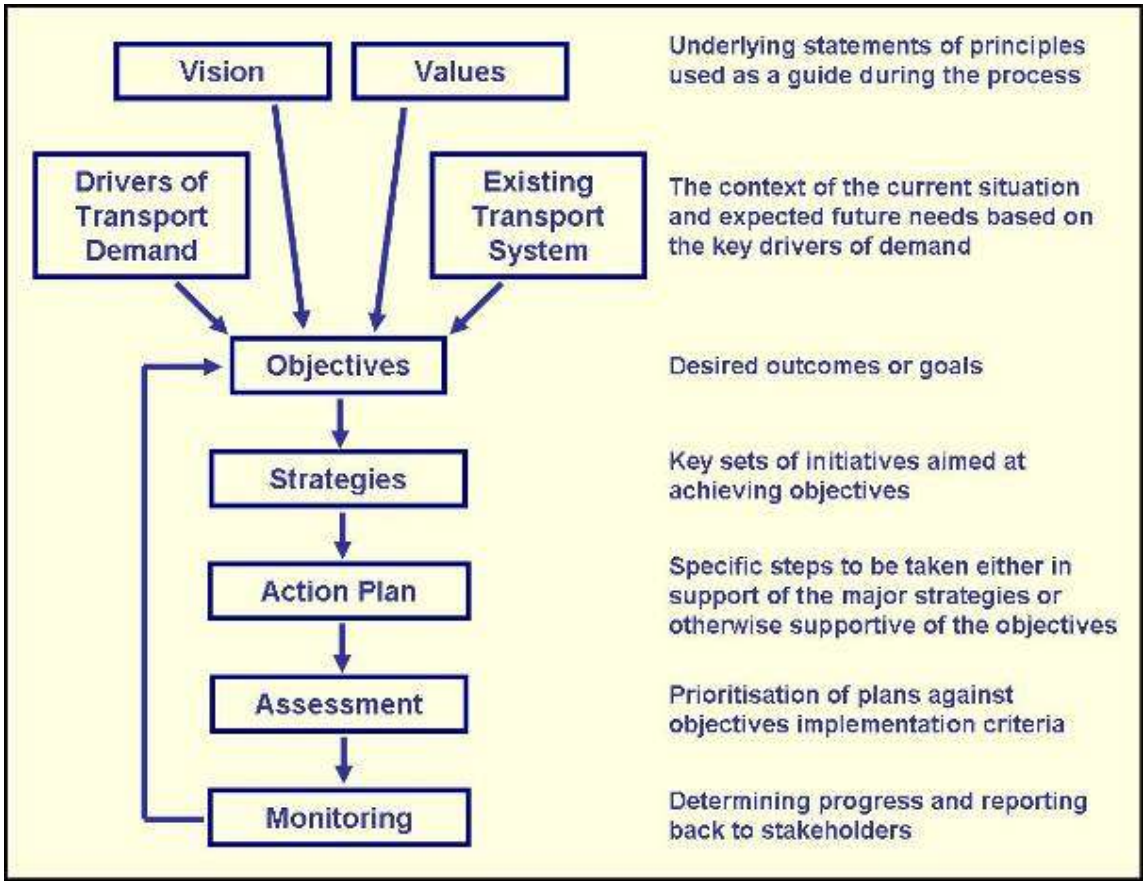
The Strategy Process

The development of the strategy has followed an established 12-step process involving key stakeholders.

Figure E.2 below depicts the logical flow of the main elements of the strategy process.

This report is organised in the same way, with a section devoted to each stage of the process.

Figure E.2 The Strategy Process – and the flow of this report



Vision and Values

The following statements of vision and values were jointly developed and endorsed by the management committee through the workshop process:

Vision

The Northern Victoria Regional Transport Strategy will support a carefully planned network of integrated transport infrastructure. The safe, efficient and sustainable movement of people and freight will promote economic prosperity and balance the needs of business, residents and visitors to the region.

Values

- Safe – a region with infrastructure meeting relevant standards, ensuring the health and wellbeing of visitors and residents and minimising product damage;
- Efficient – a region that provides for modal choice, allocates the necessary resources and encourages appropriate land uses;
- Sustainable – a region that maintains and enhances the natural environment and health of residents, visitors and industry now and in the future;
- Economic – a region that creates the opportunity for a more efficient and competitive supply chain and passenger transport system, promoting economic growth, business development and diversification, and strengthens existing industry and community (competitive, external benefits, sharing of benefits, balanced investment, prioritisation, whole of life costs (asset management)); and
- Community – a region that builds healthy and resilient communities through a range of services, which support mobility, amenity and equity in the community.

Key Drivers of Transport Demand

In order to develop strategies for transport it is first necessary to understand the factors that drive the demand. This understanding can be used to predict future demand trends and to determine key areas requiring improvement.

Northern Victoria is experiencing population growth and a significant investment in irrigation infrastructure which is likely to result in future growth of agricultural and manufacturing output. Demand for passenger and freight transport can be expected to grow commensurately.

Population and Health

The distribution and demographics of population drive both the need for passenger transport and the freight demand for inbound consumer goods.

Population in the region is projected to grow at a regional average of 0.7% per annum, but growth will be concentrated in larger population centres where growth may continue to exceed 1.5% per annum. Less densely populated rural areas will remain relatively stable or decline in population and in these areas the ageing population will be a driving factor for increased public transportation. Consideration should also be given to the transport needs of specific demographic groups such as the aged, young, indigenous, newly arrived immigrants.

Australia has one of the highest rates of obesity in the OECD. Public policy in relation to transport can have a determining effect on the use of alternative modes of transport which encourage exercise as part of everyday life.

Environmental Issues

Changes are likely to result from a carbon constrained future, a peak oil economy, rising fuel prices, social trends and governmental intervention in response to climate change and other environmental concerns. The exact impact of climate change on the region is difficult to predict but it seems sensible to assume that it will drive the need for cleaner transport solutions such as a modal shift from road to rail for freight, alternative fuel systems and increased use of public transport.

Primary Production

Primary production drives freight of outbound crops and intra-region freight to local processors.

The ability to make efficient use of improved irrigation infrastructure and the need to access markets will result in further concentration of agriculture and related transport demand in the future. Efficient mechanisms to transport produce to processors or to major markets will be required for the region to remain competitive.

Manufacturing

Manufacturing drives freight of inbound and intra-region raw materials and outbound finished goods.

Processing of agricultural output will continue to be the dominant manufacturing industry in the region. The emphasis on export and large national markets will continue to drive the need for efficient logistics and transport mechanisms, particularly with freight to Melbourne.

Service industry

The distribution of service industry (e.g. retail, health care, social services, education, entertainment, professional services) relative to population drives a need for passenger transport.

Service industry is likely to remain dominantly in the larger urban centres, driving passenger transport to those centres. Demand for transport between the larger centres and Melbourne is likely to increase due to connections between rural businesses and Melbourne-based parent organisations, partners and business associations.

Access to higher education in regional centres and in Melbourne results in a need by young people for increased public transport.

Visitation

Visitation for tourism and events drives a need for passenger transport.

The more tourist oriented parts of the region are likely to remain the Murray River destinations and wine producing regions. Events are likely to remain strong attractions to larger centres due to lower costs than in capital cities.

The Existing Transport Network

The Road Network

The road network consists of a mix of local and state government managed roadways that provide passenger mobility and freight vehicle access.

The national highway network has major corridors in the region which both service the region and connect cities outside the region. Both the Melbourne to Sydney and the Melbourne to Brisbane corridors pass through the region on highways to varying standards as well as the Adelaide to Sydney route on relatively minor roads.

Significant regional links are provided by the Midland, Northern and Murray Valley Highways.

The Rail Network

The Victorian rail network comprises both a broad gauge intrastate network that links regional areas with Melbourne and a standard gauge interstate line that links Melbourne and some regional areas with the national rail network. Within the subject region, the broad gauge network provides both passenger and freight access but there is no linkage to the interstate standard gauge network. At the eastern edge of the northern region, Violet Town, Euroa and Yarrawonga (Oaklands Line) are soon to benefit from the standardisation of the Melbourne to Albury/Wodonga line.

The Freight Task

Growing populations and increased agricultural efficiency indicate that freight demand will continue to increase within the northern region. It is therefore critical that infrastructure and transport strategies are developed in order to ensure ongoing and improved productivity within the region

Victoria is heavily reliant on road transport but with growing investment in the rail network by the State and Federal Government, there is an opportunity to shift a greater part of the freight task from road to rail in line with government objectives.

Strategically located intermodal facilities will assist in the efficient movement of goods to and from the Port of Melbourne and will encourage a greater proportion of freight to be carried by rail. The northern Victoria region is currently serviced by very basic intermodal facilities at Mooroopna and in southern NSW at Tocumwal. A third terminal at Boort has recently ceased operations. The Goulburn Valley Freight and Logistics Centre (GVFLC) is intended to be a regional centre for freight handling and logistics and ultimately to function as an inland port. Another intermodal terminal has been proposed at Mangalore, where there is access to road, rail and air infrastructure and over 200 hectares of land available for development.

Public Transport

The provision and usage of public transport in regional and rural areas is challenged by the geographic dispersion of the population and the reduced demand resulting from the relative ease of using personal vehicles for those with the means and ability to do so.

Passenger rail demand continues to grow. There has been recent upgrading of rolling stock on the Shepparton line and increased service on the Echuca line with increases in patronage of 7% and 12% respectively in 2008-09. Patronage on the Bendigo-Swan Hill line has increased by over 38% over the last two years. However, passenger rail services in our region remain too infrequent and too slow to be a viable option for the majority of potential passengers.

Coach and bus transport is used primarily by school students and others who lack the means and ability to drive themselves. With the exception of bus services within a few regional centres, services are generally sparse and there are significant deficiencies in connections between regional centres and their surrounding rural areas. This presents significant difficulty for people in those rural areas to gain access to services such as retail, education and health care in the larger regional centres.

Aviation

Each municipality in the region has light aircraft capacity sealed airstrips and capacity for air ambulance service. However no regular passenger services are currently provided from these facilities and past attempts have been discontinued due to insufficient demand.

The Mangalore aerodrome has capability for large aircraft and the potential for expansion, particularly in the area of pilot training.

Objectives

Given an understanding of the drivers of transport demand and the context of the existing transport network, the vision and values have been developed into the following more-specific objectives.

- Objective 1 Enhanced safety of the transport network
- Objective 2 Removal of through traffic (particularly heavy goods traffic) from built-up residential areas e.g. Nagambie, Shepparton, Echuca
- Objective 3 Preserved and enhanced community amenity
- Objective 4 Transport infrastructure of appropriate standards for industry
- Objective 5 An Improved regional heavy vehicle road network to facilitate the movement of goods
- Objective 6 Improved infrastructure to support rail freight movement
- Objective 7 Improved network access and infrastructure to support the logistics chain
- Objective 8 A transport network that better supports tourism
- Objective 9 A safe, fast and efficient road and rail passenger network
- Objective 10 Other appropriate people, movement, infrastructure e.g. Airstrips for air ambulance, bike tracks, taxi ranks, bus interchanges

Strategies

The drivers of transport demand and existing transport network are again considered in order to develop strategies for action that will best achieve the objectives. The following high level strategies have been identified as critical to achieving the objectives. Each of the strategies is supported by a range of sub-strategies that lead to specific project proposals.

- Strategy 1 - Provide safety upgrades to transport networks
- Strategy 2 – Maintain and upgrade key roads to support freight and people movement
- Strategy 3 – Create road by-passes around major towns
- Strategy 4 – Further develop road-based public transport
- Strategy 5 – Improve access to key tourism and recreation areas
- Strategy 6 – Develop and standardise the rail network
- Strategy 7 - Develop rail freight infrastructure
- Strategy 8 - Improve frequency, speed and safety of passenger rail services
- Strategy 9 – Further develop regional airports

The specific action plans identified by this strategic plan can be found in Section 7.0. Specific projects sorted first by strategy and then by municipality are listed in Appendices C and D respectively.

Assessment

Given the extensive range of potential projects identified in this strategy, it is useful for government departments, municipalities, businesses and communities to understand where funding opportunities might exist and to be able to prioritise project proposals.

An assessment framework has been developed to assist prioritisation of projects by municipalities. The tool has been used independently to perform an initial assessment using the following groups of criteria:-

- Alignment with objectives of this strategy
- Level of government commitment

The objective of the framework is to enable relative assessments of project priorities. Caution should be exercised in making relative assessments between projects in different municipalities without sufficient and comparative detail regarding each project.

The assessment framework is outlined in Section 8.

Funding Sources

A matrix has been developed (Section 9) which identifies potential funding streams for each sub-strategy from private and government sources.

Monitoring

It is intended that this strategy should be monitored by the Hume Regional Management Forum and by participating municipalities, VicRoads and the Department of Transport on an annual basis. This will allow for a progress check and for updating where actions have been accomplished or potentially usurped by other activity.

The strategy as a whole should be reviewed every three years to ensure that objectives and strategies are maintained as relevant and are up to date.

1.0 Introduction

This strategy aims to provide a transport related assessment and recommendations for the Hume Strategy for Sustainable Communities. The overall objective is to move towards a well-planned and modern network for the safe and efficient movement of freight and people that meets the needs of our communities and industries.

This strategy connects local, state and federal governments' transport objectives with the needs and economic drivers within northern Victoria, to generate a series of strategies and actions for the development of road, rail and other infrastructure.

In line with the Hume Strategy for Sustainable Communities and the Regional Strategic Planning Initiative (RSPI) this strategy has a 15-year time frame.

1.1 The Strategy Process

The strategy results from specific objectives relating to the Hume Strategy for Sustainable Communities and subsequent funding for its development form the Hume Regional Management Forum and the Department of Transport.

The development process followed an established twelve-step process as follows:

- Step 1 – Establish a Management Committee;
- Step 2 – Consultation with Key Stakeholders;
- Step 3 – Strategic Goals;
- Step 4 – Context Scan;
- Step 5 – Set Objectives and Outcomes;
- Step 6 – Develop Strategies;
- Step 7 – Develop Assessment Criteria;
- Step 8 – Undertake Assessment and Ranking;
- Step 9 – Workshop Strategic Choice;
- Step 10 – Regional Transport Strategy;
- Step 11 – Implementation;
- Step 12 - Monitoring.

This process is summarised in the Executive Summary, figure E.2.

The development of this strategy was led by a management committee formed with a representative from each of the six regional municipalities and VicRoads. The management committee engaged key stakeholders to ensure that the strategy was representative of the whole region.

This strategy is a living document providing a framework for the region to assess projects and put them forward for funding. It is important that there are strategic alignments to the Hume Strategy, the Hume Corridor Regional Transport Strategy and to other regional transport strategies. It is also acknowledged that this strategy correlates well with the recently prepared Victorian Transport Plan.

This report is structured in line with the strategy development process as follows:

- Section 1 - Introduction
- Section 2 – Vision and Values of the strategy
- Section 3 – Drivers of Transport Demand
- Section 4 - Existing transport system
- Section 5 –Objectives of the strategy
- Section 6 - Strategies and sub-strategies developed
- Section 7 - Action Plan
- Section 8 - Assessment

1.2 The Northern Victoria Transport Region

The Northern Victoria Transport Region encompasses the shires of Campaspe, Moira, Gannawarra, Loddon, Strathbogie and the City of Greater Shepparton. The total area of the northern transport region is around 11% of the state.

The region's economy is largely based on agriculture and agriculture related activity. The Goulburn Valley and its surrounding areas are often referred to as the 'Food Bowl of Australia' and the region produces 25 per cent of the value of Victoria's agricultural produce. The region has a strong export focus and substantial growth projections.

Dairying and fruit growing are the major primary industries, with significant growth in the viticulture and tomato industries. There is a growing trend within the region to provide value-added manufacturing services to support primary production. A number of Australia's largest food processing companies have their home in the region. There has been a growth of ancillary agribusiness activities such as seed supply, agrichemicals, farm machinery, wholesale and distribution, processing, marketing, and retail sales.

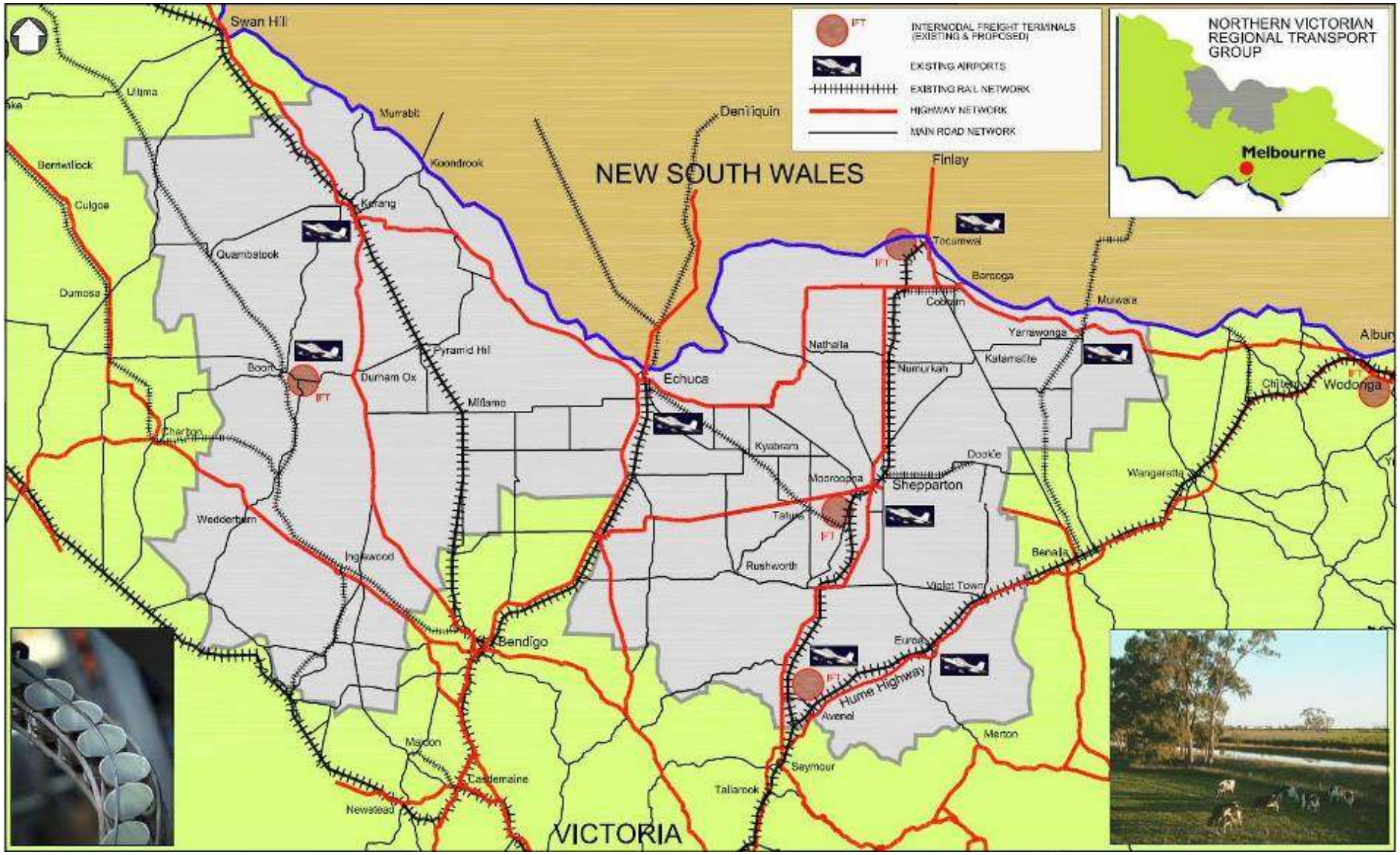
Irrigation is a key element of agriculture in a large portion of the region. Irrigation water and irrigation infrastructure in the region is managed by Goulburn-Murray Water.

To support agricultural activities, the Victorian Government strategy 'Our Water, Our Future' aims to deliver water security and improve water availability in the region. The State Government has targeted 'Modernising Victoria's Food Bowl' as a key project within its overall strategy.

A $2 billion initial investment from Federal, state and local contributions aims to improve the reliability of the Goulburn Murray system and is currently being implemented. It is anticipated that this investment will encourage businesses to take advantage of the world standard irrigation system and in turn add to the growing transport task of the region as they establish new enterprises.

Dry land farming is also significant, particularly in the southern and western parts of the region.

Figure 1.2 The Northern Victoria Transport Region



1.3 Government Funding Programs and Policies

This strategy document will be used by municipalities from the region to apply for funding from a variety of government sources. This section identifies current federal and state funding programs and policy initiatives that are most relevant to transport in the region.

1.3.1 Infrastructure Australia

Infrastructure Australia was established by the Australian Government to develop a strategic blueprint for the nation's future infrastructure needs and - in partnership with the states, territories, local government and the private sector - facilitate its implementation.

Infrastructure Australia will provide advice to Australian governments about infrastructure gaps and bottlenecks that hinder economic growth and prosperity. It will also identify investment priorities and policy and regulatory reforms that will be necessary to enable timely and coordinated delivery of national infrastructure investment. Infrastructure Australia will provide advice on nationally significant infrastructure, including transport, energy, communications and water infrastructure where further investment will improve national productivity. Advice and reports from Infrastructure Australia also will be considered by the Infrastructure Working Group of the Council of Australian Governments (COAG).

In the 2008/2009 budget, the Australian Government announced the establishment of the Building Australia Fund. Allocations from this fund will be guided by Infrastructure Australia. Other recent government announcements provide opportunities under the Economic Stimulus Package, Rail Safety Improvement and Black Spot funding programs.

1.3.2 AusLink White Paper, 2004

The Commonwealth AusLink initiative sets out to fund those land transport infrastructure projects that are considered to have the greatest long term impact for the Australian economy.

1.3.3 AusLink Corridor Strategies (2007)

An early initiative of AusLink was the development of corridor strategies in conjunction with the respective state governments. Of relevance to this strategy are the Melbourne-Brisbane and Melbourne-Sydney corridor strategies.

1.3.4 National Road Safety Strategy (Australian Transport Council 2001–2010)

In Australia's federal system of government, road safety strategy and policy measures are principally driven by state, territory and local governments who conduct their own comprehensive programs. Accordingly, this strategy has been developed as a framework document which recognises the safety plans of the Federal, state, territory and local governments and other organisations involved in road safety. Individual governments will continue to develop and implement their own road safety strategies and programs consistent with this strategy but reflecting local imperatives. The target is to achieve a 40% reduction in the number of fatalities per 100,000 of population by 2010.

1.3.5 National Strategy for Ecologically Sustainable Development (1992)

This document (adopted by all levels of government in 1992) sets out the broad strategic and policy framework under which governments will cooperatively make decisions and take actions to pursue Ecologically Sustainable Development (ESD) in Australia. It will be used by governments to guide policy and decision making, including achieving more sustainable use of energy and natural resources in urban areas through integrated urban and transport planning and more efficient sub-division and building design.

1.3.6 National Climate Change Policy

The Australian Government recognises climate change as one of the greatest social, economic and environmental challenges of our time.

Australia formerly ratified the Kyoto protocol in December 2007, requiring the nation to meet targets for greenhouse gas emissions over the five year period from 2008 to 2012 - Australia's annual target is 108% of our 1990 emissions.

The Australian Government is expected to introduce legislation for a national climate change policy in the near future.

The Department of Climate Change identifies the following elements of a national action plan.

- A commitment to reduce Australia's greenhouse gas emissions by 60% on 2000 levels by 2050.
- Implementing an emissions trading scheme by 2011, subject to passing of legislation.
- Setting a 20% target for renewable energy by 2020.
- Investing in research and development on low emissions technologies.
- Helping households and businesses to use energy more wisely.
- Managing our land to reduce emissions.

Appendix A provides a detailed assessment and discussion of the potential impacts of environmental changes to the northern Victoria region.

1.3.7 National Greenhouse Strategy (1998)

The National Greenhouse Strategy was developed by the Commonwealth and all state and territory governments in 1998.

The strategy maintains a comprehensive approach to tackling greenhouse issues. The range of actions it encompasses reflects the wide-ranging causes of the enhanced greenhouse effect and the pervasive nature of its potential impacts on all aspects of Australian life and the economy.

The strategy focuses action on three fronts: improving our awareness and understanding of greenhouse issues; limiting the growth of greenhouse emissions and enhancing greenhouse sink capacity; and developing adaptation responses.

The National Greenhouse Strategy includes a measure to "encourage greater use of public transport, walking and cycling" as one of many aimed at limiting greenhouse gas emissions and at the same time, improving air quality and reducing traffic congestion.

This includes:

- Integrating land use and transport planning;
- Travel demand and traffic management;
- Encouraging greater use of public transport, walking and cycling;
- Improving vehicle fuel efficiency and fuel technologies; and
- Freight and logistics systems.

1.3.8 Victorian Government

The following strategies and funding programs support improvements to regional transport infrastructure and have a direct influence on the northern Victoria transport network.

- The **Victorian Transport Plan** is the state strategy released on December 8th 2008. It identifies $38 billion of projects and initiatives, provides a framework for future land development in order to reduce travel distances and provides a sequential plan for major transport investment.
- **Freight Futures – Victorian Freight Network Strategy (2008)**, aims to "drive the development of an efficient, sustainable freight network for the future that balances the needs of the growing Victorian economy and population with the quality of life aspirations of the Victorian community".
- **Victorian Rail Freight Network Review (2008)** provides analysis of the state's rail freight network.
- **National Transport Links – Growing Victoria's Economy (2007)** is the Victorian Government's strategy to upgrade the state's transport network under AusLink 2 for the future growth and prosperity of Victoria and Australia.
- **Growing Victoria Together (2005 update)**, aims to 'better link Melbourne and regional ports to industry and agricultural centres across Victoria'. Efficiency and accessibility of moving passengers and freight is critical to regional development. The proportion of freight to be moved by rail to and from ports is projected to increase to 30% by the year 2010.
- **Regional Infrastructure Development Fund** aims to improve the competitive capacity of regional Victoria and enhance economic development through investment, job creation and the promotion of export opportunities.
- **Level Crossing Upgrade Program** is the Victorian Government strategy to ensure level crossings are safe for road, rail and pedestrian traffic across the state.
- **Connect Freight** is a Victorian Government program to improve the movement of freight through the use of technology innovations.
- **Melbourne Portal Strategy** outlines Victoria's need to better integrate the Port of Melbourne with road and rail infrastructure and freight terminal facilities to ensure freight can be moved quickly and efficiently. The portal strategy provides an effective long term strategic planning framework to optimise existing land and infrastructure, ensure development of efficient transport links and manage the predicted freight trade growth in a sustainable manner.
- **Travel Smart** and **Local Area Program Grants** aims to increase the capacity of councils and other organisations to develop and implement a range of projects that encourage changes in travel behaviour.
- **Local Area Access Program (LAAP)** provides funding for small-scale infrastructure projects which aim to improve access to local-area walking, cycling and public transport.
- **Meeting Our Transport Challenge** is the Victorian policy for improving transport infrastructure and services to ensure Victoria remains one of the world's most liveable places.
- **Linking Victoria – Victoria's Rural Arterial Road Network Strategy** aims to provide a clear and community-oriented strategy for managing Victoria's major rural roads which play a vital role in making Victoria a better place in which to live, work, visit and do business.
- **Moving Forward in Provincial Victoria** aims to provide support for growth and development in regional communities.
- **Arrive Alive 2008-2017** –is Victoria's road safety strategy.
- **VicRoads, Midland Highway A300 – Geelong to Benalla Management Study 2004**
- **VicRoads, Murray Valley Highway B400 - Corryong - Robinvale Management Study 2004**
- **VicRoads, Hume Freeway - Management Study 2004**
- **Transport Connections** is a multi-department joint initiative of the Victorian Government aimed at utilising existing assets to provide transport solutions through local coordinators and local working groups.

ACTIONS – Section 1 - Introduction	
A1.1	Develop strong links with federal and state funding bodies and introduce the Northern Victoria Regional Transport Strategy and list of actions.
A1.2	Regularly update the Northern Victoria Regional Transport Strategy on advice from federal and state funding bodies such that the strategy reflects the strategic intent of their programs and therefore our regional actions have the best ongoing ability to attract funding.
A1.3	Continue to engage with industry and transport operators and system users to update the priority actions from time to time.
A1.4	Work with industry and transport operators to understand the environmental and safety benefits of more efficient transport systems.

2.0 Vision and Values

Throughout the strategy development process, a series of workshops were conducted in which the management committee and relevant stakeholders worked together to agree on a vision and a set of values and ultimately on the objectives and strategies.

An examination of the values and vision was a critical component of setting the framework for the Regional Transport Strategy and determining the required outcomes. This provided a clear focus for each theme and helped to ensure a co-ordinated approach to transport planning for the region.

The vision and values are expanded further below.

2.1 Vision

The vision endorsed by the management committee through the workshop process is as follows:

The Northern Victoria Regional Transport Strategy will support a carefully planned network of integrated transport infrastructure. The safe, efficient and sustainable movement of people and freight will promote economic prosperity and balance the needs of business, residents and visitors to the region.

2.2 Values

A set of statements reflecting the values the management committee felt were important in the context of the region are as follows:

- Safe – a region with infrastructure meeting relevant standards, ensuring the health and wellbeing of visitors and residents and minimising product damage;
- Efficient – a region that provides for modal choice, allocates the necessary resources and encourages appropriate land uses;
- Sustainable – a region that maintains and enhances the natural environment and health of residents, visitors and industry now and in the future;
- Economic – a region that creates the opportunity for a more efficient and competitive supply chain and passenger transport system, promoting economic growth, business development and diversification, and strengthens existing industry and community (competitive, external benefits, sharing of benefits, balanced investment, prioritisation, whole of life costs (asset management)); and
- Community – a region that builds healthy and resilient communities through a range of services, which support mobility, amenity and equity in the community.

ACTIONS – Section 2 – Vision and Values	
A2.1	Review the vision, values and objectives every three years.

3.0 Drivers of Transport Demand

3.1 Fundamental Drivers of Transport Demand

The following factors are the fundamental drivers of transport demand:-

- **Population & Health** — The distribution and demographics of population drive both the need for passenger transport and the freight demand for inbound consumer goods. The national need to address a growing problem of obesity needs to drive programs which positively encourage alternate modes of personal transport that incorporate exercise. Transport solutions need to address social inequities caused by the difficulty of certain demographic groups to access education, health care and other services.
- **Environmental Issues** — Changes resulting from fuel prices, social trends and governmental intervention in response to climate change and other environmental concerns.
- **Primary Production** — Primary production drives outbound freight of un-processed goods and intra-region freight to local processors.
- **Manufacturing** — Manufacturing drives inbound and intra-region freight of raw materials and outbound freight of finished goods.
- **Service industry** — The distribution of service industry (e.g. retail, health care, social services, education, entertainment, professional services) relative to population drives a need for passenger transport.
- **Visitation** — Visitation for tourism and events drives a need for passenger transport.

The six municipalities covered in this strategy are highly diverse in their demographics, economic bases and attractions for tourism. Hence their transportation needs, while inexorably connected are somewhat different. This section will identify the diversity and outline the fundamental drivers for transport in different parts of the region.

3.2 Population & Demographics

3.2.1 Population Density

The northern region has a population of approximately 155,000 residents. Table 3.2.1 shows that while the region as a whole has essentially the same population density as regional Victoria, the population is very unevenly distributed across the region. The majority of the region population is in the eastern portion, with 81% of the total within Greater Shepparton, Campaspe and Moira.

Table 3.2.1 Population and Population Density in Northern Victoria Region

	Greater Shepparton	Campaspe	Moira	Gannawarra	Strathbogie	Loddon	Total Northern Region	Total Regional Victoria
Est. Population June 30th 2007	59,730	37,763	28,223	11,634	9,733	8,077	155,160	1,398,528
Area (Square km)	2,422	4,519	4,045	3,732	3,302	6,694	24,714	219,722
Pop. Density (persons/sq km)	24.7	8.4	7.0	3.1	2.9	1.2	6.3	6.4

Source: ABS estimated resident population at 30 June 2007, Areas from ABS Nat. Regional Profile

Greater Shepparton stands out with 38% of the region's total population and a population density almost four times the regional average (more than 20 times greater than in Loddon). The township of Shepparton itself has a population of around 30,000. Shepparton acts as the regional activity centre for much of Moira, Campaspe, and much of Strathbogie. Parts of Strathbogie utilise Benalla as a regional centre for services and residents of Loddon and Gannawarra mainly utilise Bendigo. Both Benalla and Bendigo are outside the region of this study.

Campaspe has 24% of the region's total population and a higher than average population density due to the townships of Echuca (around 12,400) and Kyabram (around 5,600).

Moira has 18% of the region's total population and a slightly higher than average population density due to the border townships of Yarrawonga (around 5,700) and Cobram (around 5,100).

Gannawarra, Strathbogie and Loddon all have densities significantly less than the regional average. This reflects the general rural nature of those municipalities and the lack of any large townships. The largest townships within each of these municipalities is Kerang (around 3,800), Euroa (around 2,800) and Boort (around 800) respectively.

3.2.2 Population Growth

Population trends presented in Table 3.2.2 show that the more populous municipalities have stronger past and projected future population growth. The less populous municipalities are all suffering the fall in population arising from few major employers and a higher concentration of farming activity. These factors cause young people to move out of the region.

Table 3.2.2 Population Trends and Forecasts 1996 - 2026

	Greater Shepparton	Campaspe	Moira	Gannawarra	Strathbogie	Loddon	Total Northern Region	Total Northern Region Growth (AAGR)
1996	54,179	34,708	25,856	12,565	9,285	9,098	145,691	
2001	55,082	36,349	26,810	12,055	9,648	8,604	148,548	0.4%
2006	59,280	37,486	27,983	11,665	9,628	8,095	154,137	0.7%
2011 – Forecast	63,208	39,051	29,516	11,553	9,856	7,990	161,175	0.9%
2016 – Forecast	66,368	40,305	30,728	11,330	10,081	7,874	166,685	0.7%
2021 – Forecast	69,139	41,490	31,859	11,070	10,311	7,749	171,617	0.6%
2026 – Forecast	71,606	42,648	32,964	10,810	10,562	7,674	176,264	0.5%
Growth Forecast 2006-2026	0.9%	0.6%	0.8%	-0.4%	0.5%	-0.3%	0.7%	

Source: ABS Regional Population Growth, 3218.0, ABS 2006 Census of Population and Housing, DSE Victoria in Future 2008, Projection of Estimated Resident Population (ERP)

As the overall population profile in the region is ageing and there are changes in land use patterns across the region, we expect to see increasing population concentration in the various urban centres that provide access to services, particularly retail, recreation, health and education services. Therefore the regional's major central cities will continue to grow more strongly than most other locations in the region. As an example, Shepparton has experienced one of the strongest annual growth rates in regional Victoria for the past ten years.

A secondary driver of population growth is the search for suitable retirement locations and the attraction of the Murray River resulting in above average population growth in municipalities bordered by the river with good access to the afore mentioned services. Yarrawonga and Bundalong have experienced spectacular growth and Moama (across the border from Echuca) is one of the fastest growing townships in New South Wales.

Concentrated urban population growth will lead to increased demand for residential housing in the urban growth areas, particularly in Shepparton, Moira and Campaspe. To satisfy this demand for housing stock, it will be necessary to increase the overall supply, leading to an increase in demand for residential land, or in some cases redevelopment or reuse of urban sites. The increased demand for residential housing will be exacerbated by trends towards smaller household sizes, mainly as a result of an ageing population.

Urban development and population growth likewise leads to (or is led by) employment growth. Demand for land is increased with demand for retail, services and various commercial and light industrial uses that is directly related to the size of the residential population. Changes in industry structure will also lead to an increase in demand for land, but this demand will depend on the rate of re-use of existing sites, relative cost structures of reuse compared with Greenfield development.

It is also worth noting that Greater Bendigo is forecast to experience population growth exceeding 1% between 2006 and 2031. While outside the region of this report, Bendigo is the main service centre for Loddon and Gannawarra.

3.2.3 Population Age Profile

As has been shown with population growth, the age profile within the region is also skewed according to population and population density.

Greater Shepparton, Campaspe and Moira have higher percentages of younger people.

Gannawarra, Loddon and Strathbogie have smaller populations, and a smaller share of their residents is in the active labour force age bracket. With over 20% aged 65 years and over, their population is older in comparison with the more populous municipalities. In comparison, the share of residents aged 65 years and over is only between 14% and 20% in Shepparton, Campaspe and Moira.

Table 3.2.3 Population Age Profile for Northern Victoria Region, 2006

	Shepparton	Campaspe	Moira	Gannawarra	Strathbogie	Loddon	Total Northern Region
0-14 years	22%	22%	20%	20%	17%	19%	21%
15-24 years	13%	11%	11%	10%	9%	9%	12%
25-44 years	26%	24%	23%	22%	20%	20%	24%
45-64 years	25%	27%	27%	28%	32%	31%	27%
65 yrs. & over	14%	17%	20%	21%	22%	21%	17%
Total	100%	100%	100%	100%	100%	100%	100%

Source: ABS 2006 Census of Population and Housing

The disparity in age profiles results in differing needs for public transport. Both young and old people have needs for public transport when driving is not an option. Young people have needs for education and recreation activities and old people have increased needs for access to health care and everyday requirements.

Figure 3.2 Centres of Population in the Northern Victoria region

3.2.4 Employment

Employment categories for the resident labour force are shown in Table 3.2.4.

Table 3.2.4 Employment by Industry in the Region – 2006

By percentage of total and by job numbers in thousands

Industry	Shepparton	Campaspe	Moira	Gannawarra	Strathbogie	Loddon	Total for Region	Regional Victoria
Agriculture, forestry & fishing	10%	16%	21%	30%	22%	48%	17%	9%
	2.6	2.6	2.4	1.4	0.9	0.9	10.7	
Retail & Wholesale Trade	17%	15%	14%	14%	11%	7%	15%	16%
	4.4	2.3	1.6	0.7	0.4	0.1	9.7	
Manufacturing	13%	15%	16%	9%	12%	13%	14%	12%
	3.4	2.4	1.8	0.5	0.5	0.2	8.8	
Health care & social assistance	12%	10%	10%	9%	9%	2%	10%	11%
	3.1	1.6	1.1	0.4	0.4	0.0	6.6	
Construction	7%	7%	7%	6%	7%	7%	7%	8%
	1.9	1.1	0.8	0.3	0.3	0.1	4.6	
Education & training	7%	6%	5%	5%	7%	2%	6%	8%
	1.9	1.0	0.6	0.3	0.3	0.0	4.1	
Accommodation & food services	5%	6%	7%	4%	5%	2%	6%	6%
	1.3	1.0	0.8	0.2	0.2	0.0	3.5	
Professional, technical & financial services	6%	5%	4%	4%	5%	2%	5%	6%
	1.5	0.8	0.4	0.2	0.2	0.0	3.1	
Transport, postal & warehousing	4%	4%	4%	4%	6%	5%	4%	4%
	1.0	0.6	0.5	0.2	0.2	0.1	2.6	
Public administration & safety	4%	4%	3%	5%	6%	4%	4%	6%
	1.0	0.6	0.3	0.2	0.2	0.1	2.4	
Electricity, gas, water & waste services	2%	1%	1%	2%	1%	2%	2%	1%
	0.5	0.2	0.1	0.1	0.0	0.0	1.0	
Mining	0%	0%	0%	1%	0%	1%	0%	1%
	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
Other services	9%	8%	7%	6%	8%	5%	8%	10%
	2.3	1.3	0.8	0.3	0.3	0.1	5.1	
Inadequately described/Not stated	2%	2%	2%	2%	3%	2%	2%	2%
	0.6	0.4	0.2	0.1	0.1	0.0	1.5	
Total Jobs	100%	100%	100%	100%	100%	100%	100%	100%
	25.5	16.0	11.6	4.9	4.1	1.8	63.8	

Source: Derived from ABS 2006 Census of Population and Housing

Note: Certain ANZSIC codes for industry have been merged to enhance clarity of distribution.

The category of manufacturing includes food processing.

It should be noted that there is significant variation within the region, particularly between the highly agriculture-based eastern municipalities of Loddon and Gannawarra compared to the more diversified economies of Shepparton and Campaspe in particular.

Not surprisingly, the municipalities with larger townships have a higher percentage of jobs and significantly greater total numbers of jobs in service industries of retail, health care, education, accommodation and food services. These jobs are concentrated in the townships of Shepparton/Mooroopna, Echuca, Yarrawonga/Mulwala, Cobram and Kyabram.

Tourism is an important driver of the economy but its impact is dispersed over a number of industries and therefore not readily measurable. ABS has prepared the Tourism Satellite Account to the Australian National Accounts and this shows the industries that have a significant tourism component. Tourism comprises approximately 14% of the gross value added by Air & Water Transport and by accommodation; it comprises 10% for cafés and restaurants, and 12% of other retail trade, with the remaining 50% distributed over all other industries.

The employment statistics suggest differing priorities for transport around the region, especially when consideration is given to the actual number of jobs in addition to the relative percentages.

Personal transport to work is only practical by personal car for most people in less populated areas.

In the larger centres with high numbers of jobs in service industries and higher population densities, there is a strong case to be made for increased public transport. Public transport encourages increased exercise for access at each end of the trip and relieves the burden of parking in town centres.

3.2.5 Health

Rates of overweight and obesity have been dramatically increasing in Australia. According to the National Health Surveys conducted by ABS, over the period from 1995 to 2004-5 the rate of adults classified as overweight grew from 32% to 35% and the rate of adults classified as obese grew alarmingly from 12% to 18%. These figures are determined by a calculation of body mass index based on self-reported data of height and weight. Studies by the Organisation for Economic Co-operation and Development (OECD) indicate that Australia's obesity rate ranks amongst the highest of economically developed nations in the world.

The cost of obesity to Australia has been widely estimated. A 2008 study by Access Economics for Diabetes Australia estimated that the direct financial cost of obesity to Australian was $8.3 billion in 2008. Significantly higher figures are reached if a financial value is placed on human life.

The relevance to transport is that the major causes of excessive weight are diet and exercise – and exercise can be encouraged through choices of public transport strategy. Strategies which include encouragement or facilitation of walking or bicycle riding as an element of transport will have an impact on the lifestyle and health of the population. Policies which promote public transport will also encourage walking since few trips by public transport will be door-to-door.

Conclusion – Population and Health

There are significant disparities in population demographics around the region which means that different transport solutions will be priorities in different parts of the region.

At one extreme are the larger population centres with urban characteristics of lifestyle and employment. These areas have the highest population densities, the strongest population growth and the youngest population. In some of these areas there will be issues of congestion requiring by-passes and road widening. The population is sufficient to warrant and enable significant public transport which will have benefits to public health and to parking and congestion relief in town centres.

At the other extreme are the large areas with sparse, older populations exacerbated by little growth or even population declines. In these areas, there will be issues of funding for maintenance and upgrading of roads with low local rate bases. The aging population will require increased levels of public transport, which will be challenged for financial viability by the low population densities. Innovative public transport solutions are required to connect residents of rural areas with services and onward transport modes which are only available at larger centres.

Public health should not be ignored by a transport strategy. There are conscious choices which can be made – particularly in relation to public transport in larger towns – which can promote alternative modes of transport and encourage walking and bicycle riding as an increased part of the personal transport mix. Incorporation of infrastructure for public transport, pedestrians and bicycles into planning guidelines and public area developments can enable local Councils to promote non vehicle transport.

3.3 Environmental Issues

Future Climate Change in Northern Victoria

Appendix A contains a detailed assessment of the potential impacts from climate change.

Human-induced change in climate is inevitable in Australia. While Victorian climate change scenarios for the year 2030 have been used to assess the impacts on the northern Victoria region, the exact impact of climate change on the food bowl is difficult to predict. It seems likely however, that left unmitigated, these impacts are likely to affect the dynamics of the northern Victoria region through local changes such as declining agricultural productivity.

CSIRO data, as published in the Goulburn Broken Catchment Management Authority's report on "Climate Change in the Goulburn Broken" suggests that our region has increased in average daily maximum temperature by 0.4°C during the decade 1998 to 2007 compared to the previous 30 year average. Projections for the Goulburn Broken region using medium emissions assumptions indicate that between 1990 and 2030, the average annual temperature will increase by 0.9°C and average rainfall will decrease by 3%.

Recent global experiences also indicate that climate change might also result in a higher incidence of more extreme weather conditions. Transport modes must be prepared to react to such events.

The Victorian Climate Change Green Paper, released in June 2009 proposes three broad options for reducing emissions from the transport sector; reducing the number of trips, encouraging modal shift and promoting low emissions vehicles and transport.

The recently released draft Northern Victoria Sustainable Water Strategy discusses ways to maximise utilisation of water in the future when reduced availability and reliability can reasonably be expected. This document is significant in that it represents regional approaches to countering falling water supplies in a way that might sustain the viability of agriculture – one of the key drivers of the local economy and of freight transport.

Conclusion – Environmental Issues

While the future extent of climate change and the degree to which it is human-induced will be sources of ongoing research and debate, there is little doubt that climate change is real and will have an impact on the way in which we live, what methods of agriculture are employed and how we use water. There is also little doubt that we will live in a carbon constrained future with the economy impacted by peak oil and volatile fuel prices. The significance to transportation is twofold.

Firstly, we must consider whether the changing environment will significantly affect the drivers of transport. The key question for our region is whether we believe that the changing environment will affect the agricultural basis of our economy resulting in changes to population and production volumes. There seems little doubt that agriculture types and methods will change and will be more sophisticated in order to compensate for changes to the water supply. However, the long term demand for agricultural production will be increasingly strong due to rising world population. It seems logical to conclude that economic forces will drive the necessary changes to agricultural practice and that production volumes will remain, albeit with a potentially different mix of output. We must conclude for transportation that there will be an ongoing need for freight of agricultural output and that the regional population will continue to increase. Extreme weather conditions, which appear to be increasing in frequency and severity, should prompt further consideration of backups for critical infrastructure such as single river crossings and critical parts of the rail network.

Secondly, we must consider what means are available through transportation strategy to mitigate the causes of human-induced climate change. For freight transport, we must pursue means to improve the efficiency of logistics networks such that vehicles can operate more efficiently, including larger vehicles with reduced fuel consumption and emissions per tonne of freight carried. We must also pursue means to achieve a modal shift for freight from road to rail. For passenger transport, we must pursue policies and projects which encourage greater use of public transport, walking and cycling as an alternative to private motor vehicles. Improved bus networks, improved connectivity between public transport and improved passenger rail services will all contribute.

3.4 Primary Production

Various types of agriculture are the major industries in the study area. Agriculture, forestry and fishing provides employment to almost 17% of the working population; significantly higher than the 9.2% average for regional Victoria.

Table 3.4 provides an overview of the value of agricultural production to the study area.

Agriculture relies on the availability of water for irrigation, a temperate climate suitable for growing many fruits and vegetables, irrigated pasture for dairy herds, and the availability of labour for harvesting, fruit picking, manufacturing and transport logistics.

Table 3.4 Value of agricultural production in Northern Victoria

	Value of crops ($ million)	Value of livestock processing ($ million)	Value of livestock products ($ million)
Loddon	57.7	36.4	31.1
South Loddon	42.1	17.6	22.1
Gannawarra	79.1	60.7	109.4
Echuca	0.7	0.7	3
Campaspe	91.9	98.1	226.1
Strathbogie	29.5	26.2	18.3
Shepparton	206.9	57.3	147.6
Moira	116.7	49.5	155.2
Totals	**624.6**	**346.5**	**712.8**

Source: ABS 2001

3.4.1 Irrigation

Irrigation is the lifeblood for much of the agricultural industries in the northern Victoria region. Recent drought, reduced long-term stream run-off and potential climate change impacts have raised concerns for the long range security of water availability.

To support agricultural activities in the region, the Victorian Government strategy 'Our Water, Our Future' aims to deliver increased water security and availability. In October 2008, the Victorian Government released a draft for community comment of a Sustainable Water Strategy for the northern region. This document aims to identify threats to water quality and availability over the next 50 years and to assist regional communities to plan for a future with different expectations regarding water.

The State Government has targeted the region through the 'Modernising Victoria's Food Bowl' project as an integral part of its overall water security strategy. With $2 billion of federal, state and local contributions allocated over the coming years to upgrade infrastructure and service performance, it is estimated that there will be significant reductions of water losses in the system. This will result in a more efficient irrigation supply to the northern Victoria region and provide the opportunity to increase economic activity in the area. The outcome of these actions will be to reduce the economic impact of drought (or potential disturbances associated with climate change) to the region and provide security to the residents and industry that rely on the irrigation system.

The national Murray Darling River Basin Strategy, aims to improve security in the availability of water and quality of the key river systems that supply the food production regions of the nation.

It seems likely that while the efficiency of irrigation infrastructure will improve, the cost of water will increase and the availability of water will decline. These changes will favour those irrigators that use water efficiently and it seems likely that there will be trend towards feed-lot style of dairy production and a trend towards horticulture. Both will increase the intensity of transport requirements on local roads.

3.4.2 Dairy Industry

The dairying industry is a major agricultural industry in Gannawarra, Campaspe, Greater Shepparton and Moira and the subject region forms an important part of the northern Victoria/southern NSW dairying district. Dairying pasture in this district is 72% irrigated and recent consolidation in the industry has lead to an increase in average farm size to approximately 270 cows per farm.

In Gannawarra, dairying accounts for half of the shire's total agricultural production. In Shepparton, dairying is the largest industry and accounts for approximately 35% of the value of agriculture (estimated at $142 million in 2001).

Dairy farms are likely to continue to consolidate in order to increase efficiency. This will lead to increased pressure for access by larger vehicles to the farm gate.

3.4.3 Horticulture

The horticulture industry in the study area includes pears, apples, citrus, stone fruit, tomatoes and olives.

Pears and apples are significant crops in Shepparton contributing some $61m and $42m respectively in value to its agricultural production.

Tomatoes are grown around Rochester-Echuca, Corop-Colbinabbin (Campaspe), Boort-Kerang (Chirnside Horticultural in Gannawarra), and the Goulburn Valley (Shepparton). The value of production in Shepparton alone is estimated at approximately $33 million (ABS Value of Agricultural Commodities) which accounts for the major share of the region's production.

The citrus industry is concentrated along the Murray River. There are 15 growers with over 1,000 acres producing Navel and Valencia oranges in Golden Rivers Country, Gannawarra.

Stone fruit is grown in Shepparton (peaches, apricots, plums, and cherries) and in Gannawarra. In Kerang, Gannawarra there is one of the largest cherry orchards in Victoria.

The Timbercorp Olive operation near Boort is the largest single-site olive plantation in the world (2,777 hectares), generating over 50,000 tonnes of olives per year and is coupled to a processing plant for production of olive oil.

As with dairy farms, there is likely to be further consolidation of horticultural operations. Storage and packing operations will consolidate resulting in the need for service by larger vehicles.

3.4.4 Broadacre Cropping

Broadacre cropping has experienced strong growth in Victoria over the past 20 years (average of 4.7% annual growth in grain production).

Wheat and other grains are grown extensively in the western part of the region (Campaspe, Gannawarra and Loddon) and constitute a significant portion of the economy for that part of the region. Oilseed is growing in popularity and is used both as a stockfeed and for making canola oil.

Grain distribution is a significant issue for the transport network due to the volume and structure of the industry. Since grain is more of a commodity business than other crops, farmers typically sell to a small number of distributors such as GrainCorp, AWB and ABB who operate storage facilities, marketing and logistics. The industry has traditionally utilised road transport from the farm to the distributors which are established on rail lines with silos and rail car loading facilities. Grain is then transported to Melbourne, Geelong and Portland terminals by rail for processing or export. Reduced crops during the drought however, have caused the rail operators to make significant losses due to high fixed costs and there is currently a government subsidy in operation. Without the protection of the subsidy there is danger that rail operators could withdraw from the business and the grain industry would find it difficult to secure road transport when harvest volumes improve.

There are strong economies of scale for grain production which results in consolidation of farms and the consequent demand for access by larger vehicles and larger farming equipment.

3.4.5 Livestock and Meat

Livestock generates $345 million and livestock products $710 million in the region (ABS 2001).

The value of the livestock industry in Shepparton is approximately $43m, i.e. approximately on par with the value of the apple production. The pork industry has been important to the agricultural development of Gannawarra and represents 30% of Victoria's total production. Beef cattle, lambs and goats are also produced in Gannawarra. Pork and poultry production is growing with a number of significant piggeries and broiler farms, particularly in Strathbogie Shire.

There are livestock selling centres (saleyards) in Shepparton, Echuca, Cobram and Kerang.

There are abattoirs at Cobram, Echuca, Gunbower, Inglewood, Nathalia, Numurkah, Pyramid Hill, Stanhope, Tatura and Yarrawonga.

A large proportion of Australian meat is exported and there is a general trend towards consolidation and foreign ownership. The top five meat processors in Australia have over 55% of the market.

3.4.6 Equine Industry

Strathbogie Shire has a reputation in Victoria as being a centre for excellence in breeding with a number of established studs and broodmare farms. Recent strategies being implemented are trying to further enhance the standing of the region as an equine industry cluster. Shepparton has an all purpose trotting facility and training complex that provides support to the continuing growth of the industry. The report 'Economic and Social Contribution of Thoroughbred Horse Racing in Country Victoria' (2006) identifies that the equine industry contributes over $800 million to the regional economy and over 7000 employment positions, with Strathbogie and Shepparton key contributors to the industry.

3.4.7 Forestry

Forestry in the region is limited to the red gum industry along the Murray River, with some production around Koondrook, including the Arbuthnot Sawmill. The future of this activity is uncertain due to changes in timber harvesting practices along the Murray River. However, it is understood that the recently released Victorian Environment Assessment Council report on protecting the River Red Gums in northern Victoria will allow provision for limited sustainable forestry activity.

3.4.8 Mining & Quarrying

With the closure of the gold mining operations at Nagambie, there are no longer any significant mining operations in the region. There are quarrying operations Barmah, Corop, Dookie, Katandra, Kerang, Pyramid Hill, Lake Cooper, Violet Town and Yarrawonga.

Conclusion – Primary Production

Primary production in the Northern Region is anchored by the Goulburn Murray irrigation district. With anticipated climate change, increasingly tenuous water supplies and rising water costs, the emphasis is likely to shift towards those industries which can gain high leverage from water. These areas will require efficient freight solutions for transport of produce to processors or markets.

Of particular concern is the infrastructure for the high volume producers such as grain. The rail network must be maintained such that these industries have a viable transport mode when volumes rise in the future. A private enterprise model applied to the infrastructure will be unlikely to maintain the services and assets in times of drought when volumes are low.

Consolidation of operations in most areas of primary production results in a greater need to access production and storage sites with larger vehicles. It is increasingly common to see b-double vehicles travelling on local roads to the farm gate.

3.5 Manufacturing

3.5.1 Food Processing

Food processing is a high value manufacturing industry in the study area, enabling local value-adding to the agricultural production in the study area. Particularly, the processing of agricultural products employs many residents. Detailed data from ABS indicate that these industries provide significant employment to the regions population base, as well as for transient workers.

Dairy processing is one of the largest manufacturing industries across the study area. A large share of the finished dairy product is exported, i.e. milk powders, nutritional supplements, and cream cheese, which are exported by container through Port of Melbourne.

Murray Goulburn is the single largest exporter of containerised goods from the Port of Melbourne. In the northern region Murray Goulburn has dairy processing facilities including a cheese factory in Leitchville (which employs 110 staff and is planning an expansion); milk processing, cheese and nutritional supplements facilities in Cobram which employs approximately 400 people and a cheese factory in Rochester. Meiji, located adjacent to Murray Goulburn exports milk powders.

Tatura Milk Industries in Tatura manufactures a range of products and employs approximately 320 people, excluding freight to/from the factory. Snow Brand, located adjacent to Tatura Milk is a major exporter of milk powders to Asia.

Other significant dairy processors include Nestle in Echuca, Heinz Watties in Echuca and Girgarre, Fonterra (Bonlac) in Stanhope and Kraft in Strathmerton.

Fruit and vegetable processing is the other major manufacturing industry. Fruit and vegetable processing employs 1,100 people in Shepparton alone according to detailed Census data from ABS (ABS Cat No 2068.0).

Tomato processing is a major industry in Echuca (Cedenco and Simplot), Tatura (Unilever), Shepparton (Campbell's Soups and SPC-Ardmona) and Girgarre (Heinz).

Border Packers in Koondrook within the shire of Gannawarra, handles more than 400,000 cartons of fruit annually and there are large fruit packers in Shepparton including Geoffrey Thompson as well as many connected to orchards and coolstores.

Riverland Oilseed in Numurkah processes oilseed for stock feed and oil production.

Figure 3.5 shows the location of food processing centres in this region. Table 3.5 contains a breakdown of industrial locations within each of the six regional councils.

Some consolidation has occurred within the industry. SPC and Ardmona merged in 2002 and are still in the process of consolidating production of particular fruits to single sites.

3.5.2 Stock Feed Processing

Many businesses operate in the region to process and distribute stock feed. In addition there are businesses that specialise in exporting containerised hay and other stock feeds.

Stockfeed processors include Ridley Agriproducts in Mooroopna and Cohuna, CopRice in Tongala, Teangi Stockfeeds in Gunbower and Riverland Oilseed in Numurkah.

3.5.3 Wine Industry

In Strathbogie, Mitchelton and Tahbilk near Nagambie are major players in the viticulture industry. Further south, the cooler Strathbogie ranges are home to many boutique wineries and cellar doors. New wineries are continuing to be developed.

Large scale vineyards can be found in the areas surrounding Kangaroo Lake and Lake Charm in Gannawarra, northwest of Kerang. Conditions in the region have encouraged the production of bulk wines and there is scope for further plantings. The key to efficient processing of high-quality wine is to undertake crushing close to primary production, as transporting grapes over long distances is detrimental to the quality of the wine produced.

Vineyards are also significant in the Mt Camel Range in Campaspe.

While some wine is produced at the vineyard, there are also centralised facilities such as the extensive wine crushing and bottling facility developed by Ozpak near Nagambie.

In addition to freight traffic, there is passenger traffic associated with wine tourism in the major regions.

3.5.4 Other manufacturing

Many manufacturing businesses other than food processing operate in the region.

In Gannawarra Shire, these include Mawsons Group (Quarrying and Construction), AWMA (Water Control Infrastructure), Ellwaste (Waste Management) and Dunstan Farmers Engineering at Cohuna, Macs Biscuits at Kerang, Arbuthnot Sawmill and furniture manufacturers in Koondrook.

In Greater Shepparton these include; VisyPak (steel cans), Furphy Foundry (cast iron), J Furphy & Sons (pressure vessels, process/storage tanks, galvanising and laser cutting), Telfords (engineered buildings), Rubicon (irrigation control gates), Pental Soaps, SCS Plastics (food containers), EDP (fruit picking and food packaging equipment).

In Campaspe these include; Nelson Silos, Humes (engineered concrete products), Foodmach (food packaging equipment) and JNR Engineering (agricultural equipment).

In Loddon these include Bush's Pet foods and Pyramid Salt in Pyramid Hill.

In Moira these include Recopak (food packaging equipment) and Yarroweyah Engineering (rotary dairy equipment).

Conclusion – Manufacturing

Food processing is the volume-dominant manufacturing industry throughout the area and the only segment of sufficient scale to warrant specific consideration in the transport strategy. An efficient road network for receiving raw produce and efficient logistics infrastructure for outbound products is required. Significant economies could be achieved through co-location of distribution centres at intermodal terminals to enable consolidation of outbound loads, more likelihood of back-haulage, and common access to rail for export and potentially interstate produce.

Processed food represents a significant export for Victoria and it is of national importance to maintain competitive industry in this area.

Figure 3.5 Locations of major food processing centres in the Northern Victoria region

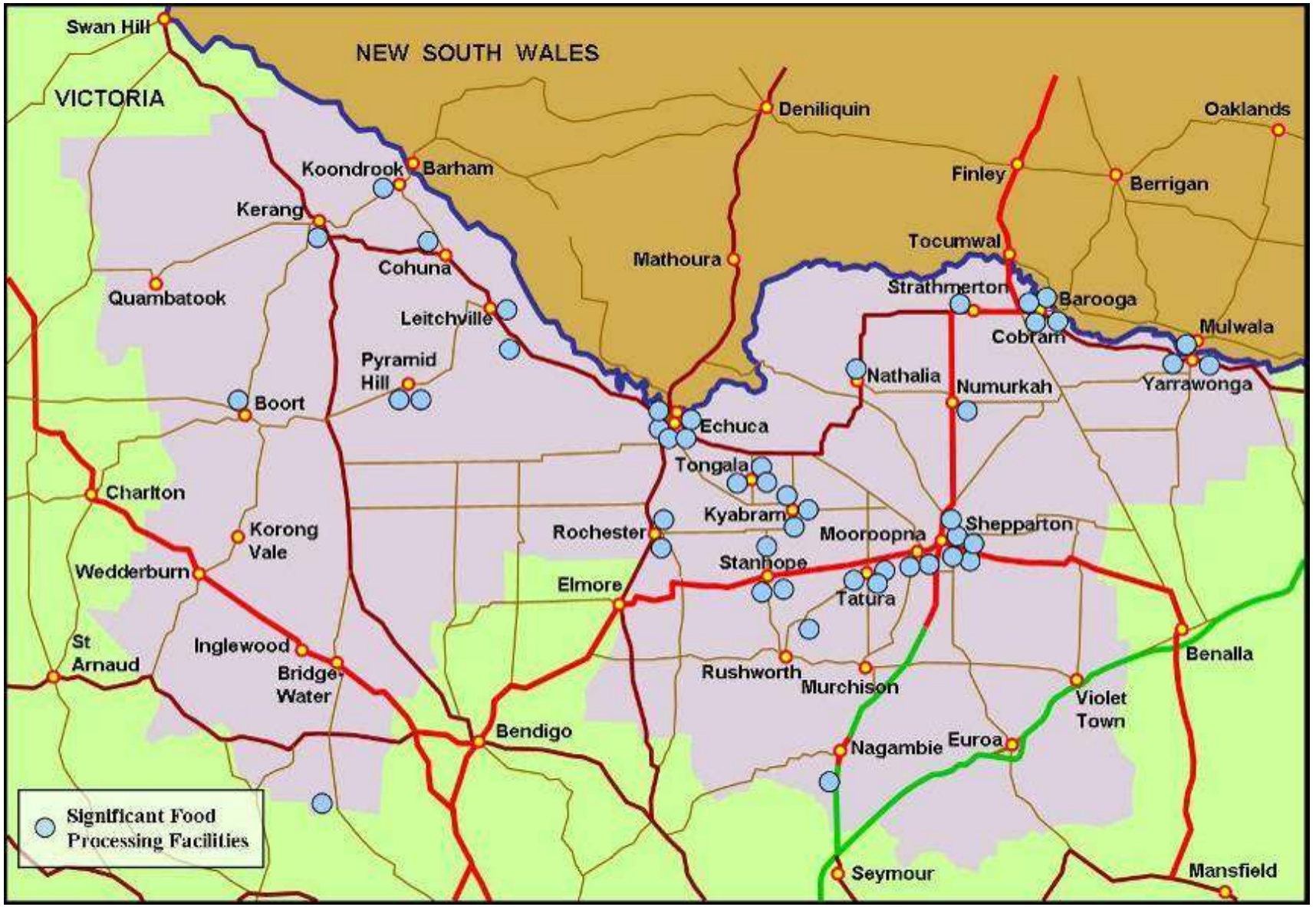


Table 3.5 Regional Manufacturing Industry

Township	Municipality	Company	Business
Shepparton	Greater Shepparton	SPC-Ardmona	Processed fruit & vegetables
		Campbell's Soups	Soup
		J Furphy & Sons	Pressure vessels, tanks, galvanizing, laser cutting, fabrication
		Furphy Foundry	Cast iron furniture
		Telford Building Systems	Engineered buildings
		Geoff Thompson Packing	Fruit storage & packing
		VisyPak	Steel cans
		Pental Soaps	Soaps
		SCS Plastics	Plastic food packaging
		Dairy Farmers	Milk processing
Mooroopna	Greater Shepparton	SPC-Ardmona	Processed fruit & vegetables
		Ridley Agriproducts	Stock feed mill
		EDP	Food wrapping equipment & fruit picking platforms
Tatura	Greater Shepparton	Tatura Milk	Milk processing
		Unilever	Processed fruit & vegetables, tomato products, dried soups
		Snow Brand	Powdered milk products
Echuca	Campaspe	Simplot	Tomato products
		Nestle	Dairy deserts
		Cedenco	Tomato processing
		Heinz Watties	Baby food
		Riverside Meats	Meat processing
		Humes	Engineered concrete products
		Foodmach	Food packaging equipment
Kyabram	Campaspe	SPC-Ardmona (formerly IXL)	Jams & preserves
		JNR Engineering	Agricultural machinery (30 staff)
		Amcor Cans	Steel cans
Rochester	Campaspe	Murray Goulburn	Cheese, milk powder, whey powder, whey protein, lactose
		Nelson Silos	Silos

Regional Manufacturing Industry - continued

Tongala	Campaspe	Nestle	Dairy deserts
		CopRice	Stock feed
		HW Greenham & Sons	Meat processing
Stanhope	Campaspe	Fonterra (Bonlac)	Dairy processing
		Stanhope Knackery	Meat processing
Gunbower	Campaspe	Teangi Stock Feeds	Stock feed, 43 staff, over 80,000 tonnes per year, owned by Ridley Agriproducts
Girgarre	Campaspe	Heinz (Girgarre Country Foods)	Tomato products
Colbinabbin	Campaspe	Reid's Stock Feed	Stock feed
Yarrawonga	Moira	ICM Farm Products	Beef cattle feedlot
		Swift Australia	Meat processing (115 staff 330 beef cattle per day capacity)
(Mulwala)	(Corowa, NSW)	Thales Australia (ADI)	Munitions
Cobram	Moira	Murray Goulburn	Cheese, whey powder, whey protein, Lactose
		Murray Goulburn Nutritionals	Infant formulas, specialty ingredients
		Swift Australia	Meat processing (150 staff 3,000 sheep per day capacity)
		High Country Meats	Meat processing
		Recopak	Food packaging equipment
Numurkah	Moira	Riverland Oilseed	Canola oil, stockfeed
Nathalia	Moira	Ryan's Abattoir	Meat processing
Yarroweyah	Moira	Yarroweyah Engineering	Dairy equipment
Strathmerton	Moira	Bega Cheese	Cheese
Kerang	Gannawarra	Cumco Gypsum	Gypsum
Koondrook	Gannawarra	Border Packers	Citrus fruit packing, 30 staff, 400,000 cartons per year
Leitchville	Gannawarra	Murray Goulburn	Cheese 110 employees 120 tonnes per day
Nagambie	Strathbogie	Oz Pak	Grape crushing & wine packaging
Boort	Loddon	Timbercorp	Olive growing and processing more than 50,000 tonnes per year
Eddington	Loddon	Freemantle Stock Feeds	Stock feeds
Pyramid Hill	Loddon	Bush's Pet Foods	Pet food
		Pyramid Salt	Salt
		Pyramid Quarries (Mawson's)	Crushed stone

3.6 Service Industry

Service industries employ approximately 55% of the employed labour force across the study area, with retail trade comprising 11.7 % and health care and social assistance comprising 10.3 %. Other service activities include accommodation and food; financial and insurance; administrative and support; education and training; and arts and recreation.

It should be noted that the spread of service industry is highly non-uniform. Larger cities such as Echuca and particularly Shepparton serve as regional centres for large geographic areas and have much higher densities of service industries. This drives a transportation need between rural areas and corresponding regional centres which is inherently poorly serviced by public transport.

3.6.1 Retail

Retail trade employs 11.7% of the employed labour force across the study area. Shepparton is an important regional city with the role as regional service centre for a substantial hinterland which includes much of northern Victoria and parts of southern NSW. In Shepparton and Mooroopna alone there is approximately 120,000 m^{2}[2] of retail floor space providing direct employment in retail for 3,370 people, which generated $1,600 million in 2005/06 (ABS 2006).

The retail industry has a high transport component. This transport component involves deliveries of goods for sale on the premises and transport of shoppers to and from the shops. Many of the consumer goods that are sold in shops are manufactured elsewhere outside of the study area and have to be transported to the region. Much of this freight is transported in trucks on the major routes from Melbourne. Shopper access to retail premises is likewise an important transport aspect of retail. As there is limited public transport in the region, this transport will predominantly be by private vehicles. A few shoppers will be able to walk to and from the shops.

3.6.2 Health care and social assistance

Health care and social assistance services are dispersed through the region based on population, access and local requirements. It covers hospitals, medical and other health care services, residential care services, and social assistance services including child care services.

Goulburn Valley Base Hospital in Shepparton is the largest hospital in the study area, and has also been granted Regional Referral Hospital status for the Hume Region. The hospital provides 280 beds and a wide range of services, managing patients from an extensive region covering northern Victoria and southern NSW with a patient catchment of approximately 160,000 people.

Echuca Regional Health is a 65-bed hospital employing 565 people which also services the neighbouring Moama in NSW.

Smaller hospitals are found in Kyabram, Rochester, Rushworth and Tatura (operated by Goulburn Valley Health), Kerang, Cohuna, Nathalia, Cobram, Numurkah, Yarrawonga, Boort and Inglewood.

Residents in Loddon and Gannawarra requiring more specialist services are also serviced by Bendigo Health Care Group in Bendigo.

Private hospitals exist in Shepparton, Euroa and Nagambie.

Primary medical care is provided by a large number of generally small GP clinics. Attracting sufficient doctors to regional Australia is a constant challenge and most areas remain underserved. A very large proportion of incoming doctors to country areas are trained overseas.

Demand for hospital and aged care services in the region will increase in the future due to the ageing of the regional population and overall population growth.

Child care services and social assistance services are dispersed through the region.

3.6.3 Education

Primary and secondary schooling is provided throughout the region. Schools in less populated areas are smaller and have larger catchments, relying on busses for student transportation.

Tertiary education is only available in the larger centres.

There are TAFE locations at Shepparton, Dookie College, Echuca and Kerang.

The University of Melbourne operates the School of Rural Health in Shepparton which incorporates the university department of rural health focussing on rural health research, and the Rural Clinical School which provides training for medical students.

The University of Melbourne, School of Land and Management operates Dookie Campus (formerly Dookie College for agricultural students and agriculture research.

La Trobe University has a campus in Shepparton and is planning a major expansion. Bendigo (outside the study area) has a significant La Trobe campus.

The Academy of Sport, Health and Education (ASHE) in Shepparton aims to involve Indigenous students in tertiary education through a focus on sport. ASHE is a joint venture of the University of Melbourne and the Rumbalara Football Netball Club.

There are various Adult and Community Education (ACE) providers throughout the region.

Transportation is a key issue for rural tertiary education. Provision of efficient public transport enables students to attend tertiary education while living at home (a culture-driven requirement of some immigrant populations) and enables students to be based in rural or regional areas while still able to attend education or training in larger centres or in Melbourne.

3.6.4 Accommodation

Table 3.6.4 Accommodation, 5 rooms or more, September Quarter 2007

Municipality	Tourism Region	Establish-ments with 5 – 14 rooms	Establish-ments with 15+ rooms	Key Destination	Number of rooms	Visitor Capacity per night (3 per room unless otherwise noted)
Gr Shepparton	Goulburn	7	18[3]	Shepparton	589[1]	1,802[2]
Campaspe	Central Murray	11	14	Echuca	516	1,548
Moira	Central Murray	9	7	Cobram	293	879[2]
Strathbogie	Goulburn	4	4	Nagambie	156	468
Gannawarra	Mallee	3	2	Cohuna Kerang	88	264
Loddon	Bendigo Loddon	2	1		49	147
Total		**36**	**46**		**1,691**	**5,108**

Source: ABS 8635255001 Tourist Accommodation, Small Area Data, Victoria, Sept 2007; Maunsell Australia Pty Ltd

Note (1): average of 3.2 beds/room, employment of 0.9 person/room for establishments with 5 - 14 rooms, and average of 3.0 beds per room, employment of 0.5 person per room for establishments with 15 rooms or more.

Note (2): ABS data

Note (3): For establishments with between 5 and 14 rooms, allow 10 rooms per establishment, for 15 rooms or more allow 29 rooms (average for Shepparton C)

Although accommodation requires passenger transport, the volume of accommodation activity is driven largely by business activity, events and tourism and hence those factors should be considered the major drivers of the transport need.

Conclusion – Service Industry

The service industry has the highest concentration in the larger urban areas. Improved public transport, encouragement of alternate commuting modes (pedestrian, cyclists) and fast access to Melbourne by passenger rail will be high priorities for these areas.

The prevalent rural Australian culture is that people use personal vehicles for shopping. This drives a high need for public parking in areas of retail concentration which can compete with needs for traffic flow and pedestrian utility. Improved public transport could reduce reliance on personal vehicles (as it does in other cultures), while providing access for those lacking the option of driving.

Public transport is especially important for health care. The ageing population is both more in need of health care and also most likely to be lacking in transport alternatives. Local bus services, taxi provisions and connectivity to train services for access to Melbourne are all important.

It is also extremely important that there should be strong public transport connections to centres of education. Young people engaged in further education may not have the financial resources to own a car and should not have this be a limiting factor in educational choices. Visitation to town centres for educational purposes should also be targeted as an area where alternative transport can play a role in reducing town centre congestion and parking limitations.

A fast, regular and reliable train service to Melbourne might make it possible for regional students to attend higher education in Melbourne without the expense of leaving home and living in an expensive city. Similarly, public transport connecting smaller rural communities to regional centres can provide educational opportunities for students while living at home.

Public transport, pedestrian and bicycle facilities can also play a broader role in improving the health of communities and impact to the environment through reducing the reliance on door-to-door car transport.

3.7 Visitation - Tourism and Events

The study area is comprised of part of the Murray region with the exception of Strathbogie, which is considered part of the high country region. The study area includes attractive and well-developed tourist destinations. In particular, the towns along the Murray River are popular holiday destinations; these include Echuca in Campaspe, and Cobram in Moira Shire. Shepparton is an important centre for meetings, conferences, and other events due to its size, central location, ease of access, facilities and accommodation. Strathbogie is host to a number of rowing and regatta events at its Nagambie Lakes regatta facility.

Tourism activity is not defined as a separate sector in employment statistics but is included in retail, transport, accommodation, restaurants and cafés. Tourism employment is estimated at approximately 5.0% of total employment in the region (The Murray Economic Profile 2005, Tourism Victoria).

Overall the Murray Region, which covers the area along the Murray from Mildura to Wodonga, is estimated to receive approximately 4.6 million visitors per annum. Of these, 2.1 million or 46% are overnight visitors and 2.5 million or 54% are day trip visitors. Intrastate visitors comprise approximately 75%, or 3.45 million; and of the 1.15 million interstate visitors, the largest share comes from NSW.

Visitor spending is estimated by Tourism Research Australia at $112 per day for daytrip visitors and $104 per night for overnight visitors. This daily spend highlights the importance of continuing to attract visitors to the region for holiday, leisure, or business purposes and to ensure that the region is easily accessible for travellers.

Visitors typically travel by car to the region, and only 25% stay in hotels, motels or serviced apartments. Instead, some 41% stay with friends or relatives while visiting the region, in caravan parks (18%) or in rented accommodation, a B&B, guesthouse or camp on private property.

There is a trend towards cyclists using public transport to explore tourism opportunities (a nationwide economic benefit estimated at $213 million). An efficient rail service could contribute to this benefit for this region.

The relative capacity to accommodate overnight visitors can be used as an indicator of the tourism industry's size in each area, keeping in mind that many visitors travel to visit family and friends and stay in private accommodation or in smaller B&Bs. Table 3.5.4 shows the number of accommodation establishments with five rooms or more in the municipalities in the region, and the estimated number of rooms and overnight visitor capacity in this type of accommodation.

There are many tourist parks and camping areas along the Murray River, near lakes and rivers and similar locations suitable for small towns in the northern part of the region where the climate is relatively mild. In Gannawarra, for example, there are eight caravan parks with capacity to accommodate over 1,700 visitors located in Kerang, Koondrook, Lake Charm and Cohuna.

The majority of tourists in the region come from the Melbourne area.

The influx of seasonal visitors for harvesting and food processing work is also relevant. Some of these seasonal visitors will seek tourism opportunities and will require transportation. International visitation to the region averages 17,000 per year, with the majority being seasonal workers. Public transport will play an important role for these international visitors who are unlikely to have their own vehicles.

Conclusion – Visitation, Tourism & Events

High quality road access to tourist and recreation areas and improved public transport will encourage growth in this important area of the region's economy. Sealing and maintenance of local roads in high tourist traffic areas should be a priority in order to encourage tourism and to reduce the impact of tourist traffic on the local population. Transport related growth could be accomplished with rail trails, tourist trains (including steam trains), tourist drives (e.g. gourmet food trail) with improved and consistent road signage and general aviation.

SUMMARY SECTION 3 – Drivers of Transport Demand

The key drivers of transport demand in the northern region are:-

Population	While the overall population of the region is expected to grow, the growth will be predominantly in the higher population density centres. Rural areas will experience declining and ageing populations.
Environmental Issues	Changes are likely to encourage freight transport by rail and a shift towards public transportation where possible.
Primary Production	Agriculture will continue to dominate the economy with emphasis on those areas which can capitalise on improved irrigation infrastructure. Farm size is likely to increase with increased concentration of most sectors.
Manufacturing	Manufacturing will continue to be dominated by food processing.
Service industry	Retail, health care and professional services are dominant in the larger urban centres of Shepparton and Echuca.
Visitation	Visitation for tourism will be concentrated on Murray River and wine growing centres. Events will attract visitors to larger centres with good facilities. Transport needs of seasonal workers should be considered.

CONCLUSION - SECTION 3 – Drivers of Transport Demand

The predicted doubling of the freight task across Australia is likely to also occur in the Northern Victoria Transport Region, leading to increased pressure on road infrastructure.

The $2 billion irrigation infrastructure modernisation programme is likely to most benefit those irrigators who can make best use of the increased control and higher available flow rates. This is likely to result in increased sophistication and additional consolidation within agricultural sectors.

The net result will be increased efficiencies and higher output which will require additional transportation. In the short term this is likely to increase the usage of B-doubles, but transport providers will look towards rail for export goods, particularly when factors of road congestion, lack of driver availability and rising fuel prices make road transport less attractive.

The growth in urban populations will drive an increased need for passenger transport between major centres (specifically Shepparton and Echuca) and Melbourne. Improved passenger rail services to centres such as Shepparton and Echuca and potentially to Cobram could help develop the economy in those centres by enabling service businesses that require efficient connectivity to Melbourne. Analysis of schedules and comparison to other regional centres indicates that frequency of service, followed by speed of service, are the key issues that need to be addressed with the train service.

Public transport is a necessary requirement for rural residents to access services only available in larger regional centres, particularly for those who do not have the ability to drive.

Population health would benefit from increased inducement or encouragement to utilise public transport in addition to walking and cycling for personal transport in and around larger towns.

Tourism would benefit from urban bypasses both due to improved access to Murray River destinations and from the reduction in through traffic to townships such as Echuca and Nagambie which have tourism potential. There are opportunities for increased tourism through improved public transport for seasonal workers and for cyclists.

Climate change will not diminish the need for freight transport or result in reduced regional populations but should drive changes in transport such as increased utilisation of public transport and a modal shift for freight from road to rail.

ACTIONS - Section 3 – Drivers of Transport Demand

A.3.1	Continue to monitor transport growth in all areas and check actual versus estimated trend into the future.
A.3.2	Monitor economic development, tourism and industry growth and plan for the impact of such growth on the transport network and transport services.
A.3.3	Influence regional and state strategic planning to recognise the growth of the region and the need for transport infrastructure to match the increasing transport demands.

4.0 Existing Transport System

4.1 The Road Network

The northern Victoria region is supported by a mix of local, state and federally funded roads, including several road corridors within the National Land Transport (AusLink) Network. The table below indicates those of most strategic significance to the region.

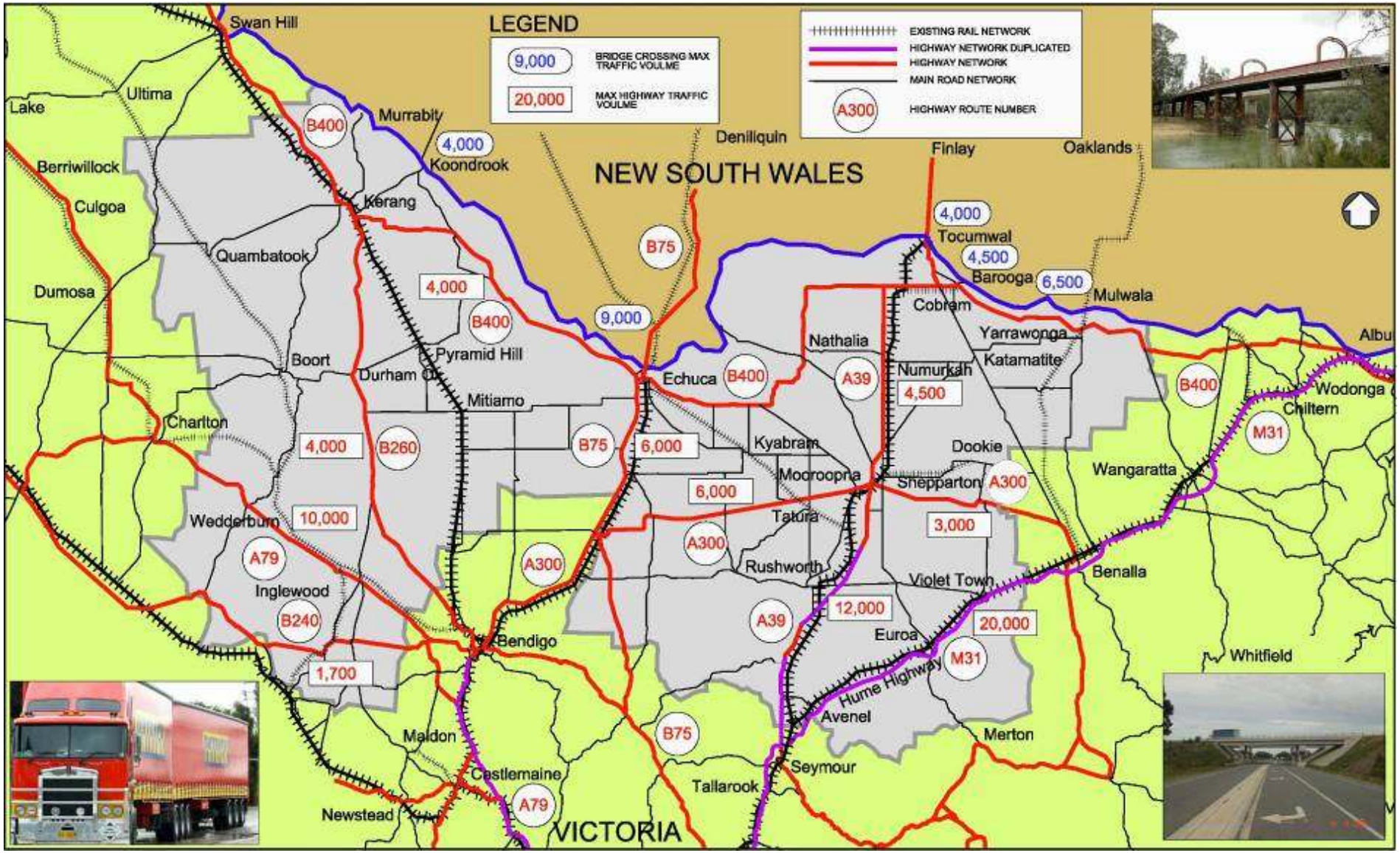
The Arterial Road Network of M, A, B and C roads is managed and maintained by the Victorian Government's State Road Authority, VicRoads. There are some roads which carry out an arterial function that are maintained by councils.

Arterial roads have become subject to increased traffic volumes and require upgrading in a number of key locations. Other requirements can include rest area improvements, shoulder sealing pavement and bridge strengthening and town bypasses.

Table 4.1.0 Strategic Road Corridors in Northern Victoria

Route	Description	Function	Max Traffic in NV region (vpd)	Length within the NV region
Hume Freeway / Highway M31	Melbourne to Sydney corridor. Passes through Strathbogie Shire.	AusLink Corridor	20,000	73 km
Goulburn Valley Highway A39	Melbourne to Brisbane corridor. Connects Tocumwal and Shepparton via the Hume Hwy.	AusLink corridor	12,000	152 km
Calder Highway A79	Melbourne to Mildura corridor. Links Loddon, Gannawarra to Melbourne via Bendigo.	AusLink corridor	10,000	53 km
Northern Highway B75	Links Echuca to Melbourne.	Regional	6,000	71 km
Midland Highway A300	Links Benalla, Shepparton, Bendigo, Ballarat and Geelong	Regional	6,000	110 km
Loddon Valley Highway B260	Links Kerang to Bendigo and then Melbourne.	Regional	4,000	103 km
Murray Valley Highway B400	Links Robinvale, Swan Hill, Echuca, Cobram and Wodonga.	Regional	4,000	280 km
Wimmera Highway B240	Links Bendigo to St Arnaud.	Regional	1700	64 km

Figure 4.1.0 Existing Highways showing Route Numbers and Traffic Volumes



4.1.1 Interstate Road Corridors

Melbourne to Sydney Corridor (M31) Hume Freeway

The Hume Freeway is the busiest interstate corridor in Australia. In southern NSW and northern Victoria traffic volumes reach around 20,000 vehicles per day, with 40 per cent of these being commercial vehicles (semi-trailers and increasingly B-doubles). The Victorian segment of the corridor is a dual carriageway freeway standard. The entire road length has been designated to carry B-double capacity vehicles.

The corridor serves three purposes. Firstly, it connects the capitals - carrying 10-20 million tonnes of freight and one million car passenger movements per year. Secondly, it is an important intrastate and regional link for the Northern Victoria region. Finally the corridor provides a vital link for local traffic.

Melbourne to Brisbane Corridor (A39) Goulburn Valley Highway

The Melbourne to Brisbane corridor passes through central Victoria along the Goulburn Valley Highway to Tocumwal, where it connects with the Newell Highway continuing north to Queensland. Commencing at the Hume Freeway on the edge of Melbourne, the southern segment of the corridor travels north-east to Seymour and then on through central Victoria. The Victorian portion of the corridor is 240 kilometres long. The road is designated as a B-double capacity road within Victorian borders. The Newell Highway within New South Wales is designated as a B-double route with some sections allocated as double road train routes.

4.1.2 Intrastate Road Network

Calder Highway (A79)

Serves as a link between Melbourne and Mildura via Bendigo. In the Shire of Loddon, the Calder Highway passes through the townships of Wedderburn, Inglewood and Bridgewater.

Northern Highway (B75)

In the Shire of Campaspe, the Northern Highway provides a link between the townships of Echuca, Rochester and Elmore with Melbourne via Heathcote.

Midland Highway (A300)

Provides an east west link between the Hume Freeway and the port of Geelong via the regional cities of Benalla, Shepparton, Bendigo and Ballarat. Through the City of Greater Shepparton and the Shire of Campaspe, this highway connects the townships of Elmore and Stanhope. This highway also provides the link to the snow ski fields of Mt Buller and other alpine region mountain resorts.

Loddon Valley Highway (B260)

This highway connects the township of Kerang in the Shire of Gannawarra with the regional city of Bendigo through the township of Serpentine.

Murray Valley Highway (B400)

Provides an east-west link between the Hume Freeway at Wodonga and the Goulburn Valley Highway at Cobram. In the shires of Gannawarra, Campaspe and Moira, the Murray Valley Highway provides an east west link between the townships of Kerang, Cohuna, Echuca, Nathalia, Strathmerton, Cobram and Yarrawonga.

This highway also provides a connection to the major Murray River crossings at Echuca, Cobram and Yarrawonga in Victoria and Tocumwal in NSW.

Wimmera Highway (B240)

At the south west corner of the Shire of Loddon the Wimmera Highway provides a link between the regional City of Bendigo and the township of St Arnaud. Both these community centres are outside the northern Victoria region as defined in this strategy.

4.1.3 Interstate Linkages - Murray River Road Bridges

Within this region, the Murray River represents the border between Victoria and New South Wales. Road bridges across the Murray exist at the seven locations described below (in order of average daily traffic). All of the Murray River Road bridges are maintained by the New South Wales RTA.

Echuca-Moama Road Bridge

Detailed traffic modelling was conducted in 2008 for a new crossing approximately 1.5km west of the existing road bridge. Traffic studies have shown that over 75% of existing bridge traffic has destination in either Echuca or Moama – there is relatively little through traffic. The existing bridge is two lanes wide, was constructed in 1879 and is estimated to carry up to 20,000 vehicles per day.

Yarrawonga-Mulwala Road Bridge

The declared arterial crossing is Mulwala Bridge. It was opened in 1924, is 5.5m wide and carries two lanes with no shoulders. It carries approximately 6,500 vehicles per day.

The Yarrawonga Weir also carries a road crossing which handles approximately 1,200 vehicles per day via a single direction, light controlled traffic lane. This crossing is planed to close in 2020.

By 2020, the average river crossing traffic has been estimated to reach 16,000 vehicles per day with peaks of 21,000 per day in holiday periods. A new bridge is to be constructed by 2020.

Cobram-Barooga Road Bridge

A new $9.6million bridge was opened in June 2006. It carries approximately 6,000 vehicles per day.

Barham - Koondrook Road Bridge

The Barham Bridge is a 6.6m wide, two lane, timber and steel bridge with a central counterweighted lift span. It was opened in 1905 and has state heritage significance. The bridge is located almost equidistant from Echuca and Swan Hill, approximately 80km west of Echuca. The bridge carries approximately 3,800 vehicles per day including interstate traffic between Adelaide and Sydney.

Tocumwal Road Bridge

The 12.0m wide concrete Tocumwal road bridge was constructed in 1987 and connects the Goulburn Valley Highway with the Newell Highway, thus forming part of the strategically important Melbourne to Brisbane corridor. It carries over 3,000 vehicles per day.

Barmah Road Bridge

The two-lane 10.0m wide concrete bridge was constructed at Barmah in 1966. The bridge is approximately 20km east of Echuca and carries approximately 800 vehicles per day of mostly local traffic.

Murrabit (Gonn Crossing) Road Bridge

This is a 5.5m wide steel bridge constructed in 1926. It connects the township of Murrabit in Victoria with Gonn in New South Wales and is located approximately 50km west of Swan Hill. It carries approximately 250 vehicles per day of mostly local traffic between Murrabit and Gonn.

4.1.4 Other Arterial Roads

The region is well served by an extensive network of other arterial roads that also provide crucial links between local community centres. The Arterial Road Network is managed and maintained by the Victorian Government's State Road Authority, VicRoads.

Arterial roads have become subject to increased truck volumes and require duplication in a number of key locations.

4.1.5 Council Controlled Municipal Roads

Municipal roads are impacted by increased truck traffic and truck loads, historic narrow width seals and historic light bush gravel pavements.

The financial sustainability of our regional municipal road network is as follows:

Table 4.1.5 Sustainability of Municipal Roads

As of 2007/2008 financial year

Municipality	Municipal Road Length (km)	Replacement value ($000)	Annual depreciation ($000)	Annual renewal expenditure ($000)	Annual Renewal gap ($000)
Shepparton	2,496	$439,210	$9,467	$7,551	$1,916
Gannawarra	2,281	$163,230	$2,670	$1,342	$1,328
Strathbogie	2,011	$129,192	$1,829	$1,270	$559
Campaspe	3,374	$388,387	$8,221	$4,711	$3,510
Loddon	4,713	$188,492	$3,789	$2,058	$1,731
Moira	3,853	$244,544	$3,350	$2,290	$1,060
Total	18,728	$1,553,055	$29,326	$19,328	$10,104

The target for local road funding is that average annual renewal expenditure will ultimately match annual depreciation. Different councils plan to achieve this target within the next five to twenty years.

Equivalent data for arterial roads was not available at the time of writing, but it is believed there is also an annual renewal gap for arterial roads.

Conclusion – The Road Network

The region has a wide range of road challenges.

The through-routes from Melbourne to Sydney and Melbourne to Brisbane carry heavy traffic volumes and in the latter case, the Goulburn Valley Highway is still in the process of being upgraded to enable this traffic to be carried more safely and efficiently.

Arterial roads, maintained by VicRoads make the critical connections between smaller regional and rural communities and facilitate access to major routes and larger regional centres.

The network of municipal roads covers a wide and often sparsely populated area and has been difficult to adequately maintain with local funds.

Many of the region's bridges are old and the rapidly growing population and growing tourism in Murray River communities is putting great strains on them.

4.2 Road Freight Task

The Victorian freight task identified in the Department of Transport document, Linking Melbourne: Metropolitan Transport Plan shows that in 2000, 14.4 million tonnes of freight was transported from regional Victoria to Melbourne, with 14% of this via rail and 86% by road. Within the state, 22.1 million tonnes of freight was transported and 11.4 million tonnes directly interstate.

Road transport is one of the largest industries within the northern Victoria region. Shepparton is provincial Victoria's largest truck sales and service centre and is often referred to as the transport hub of regional Victoria. An extremely high number of freight movements are associated with the food industry which relies on a high quality and effective distribution and transport network. Major local players in the transport and distribution industry include Patrick (Asciano), Toll and SCT Logistics.

The freight task has grown significantly in recent years. The Victorian Government Freight Futures Report (2008) quoted BTRE figures indicating 128% growth in road freight (tonne-kilometre) for regional Victoria over the period from 1991 to 2007, which represents an average annual growth rate of over 5% for that period.

BTRE modelling of future freight volumes has led to a widely held view that freight volumes will double between 2000 and 2020, which would represent an average annual growth rate of 3.5%. This projection was validated in the Auslink White Paper (2004) and has been widely supported by subsequent reports and studies.

Freight Futures (Appendix 2 – the Victorian Freight Story – Regional) quotes 2002 DOT forecasts for road freight tonnage in the Hume/Goulburn region to rise from 32 million tonnes to 58 million tonnes between 2000 and 2020 which represents an average annual growth rate of 3%.

Freight Futures separately estimates growth in the total Victorian freight task of 47% by 2020 and 97% by 2030 from 2008.

In 2006, BTRE forecast non-bulk freight in Australia to grow by an average of 3.6% per year between 2003 and 2020. More specific to this report, BTRE forecast that road freight in Victoria would grow by an average of 3.5% per year between 2004 and 2020. (Source: Freight Measurement and Modelling in Australia – BTRE Report 112, March 2006)

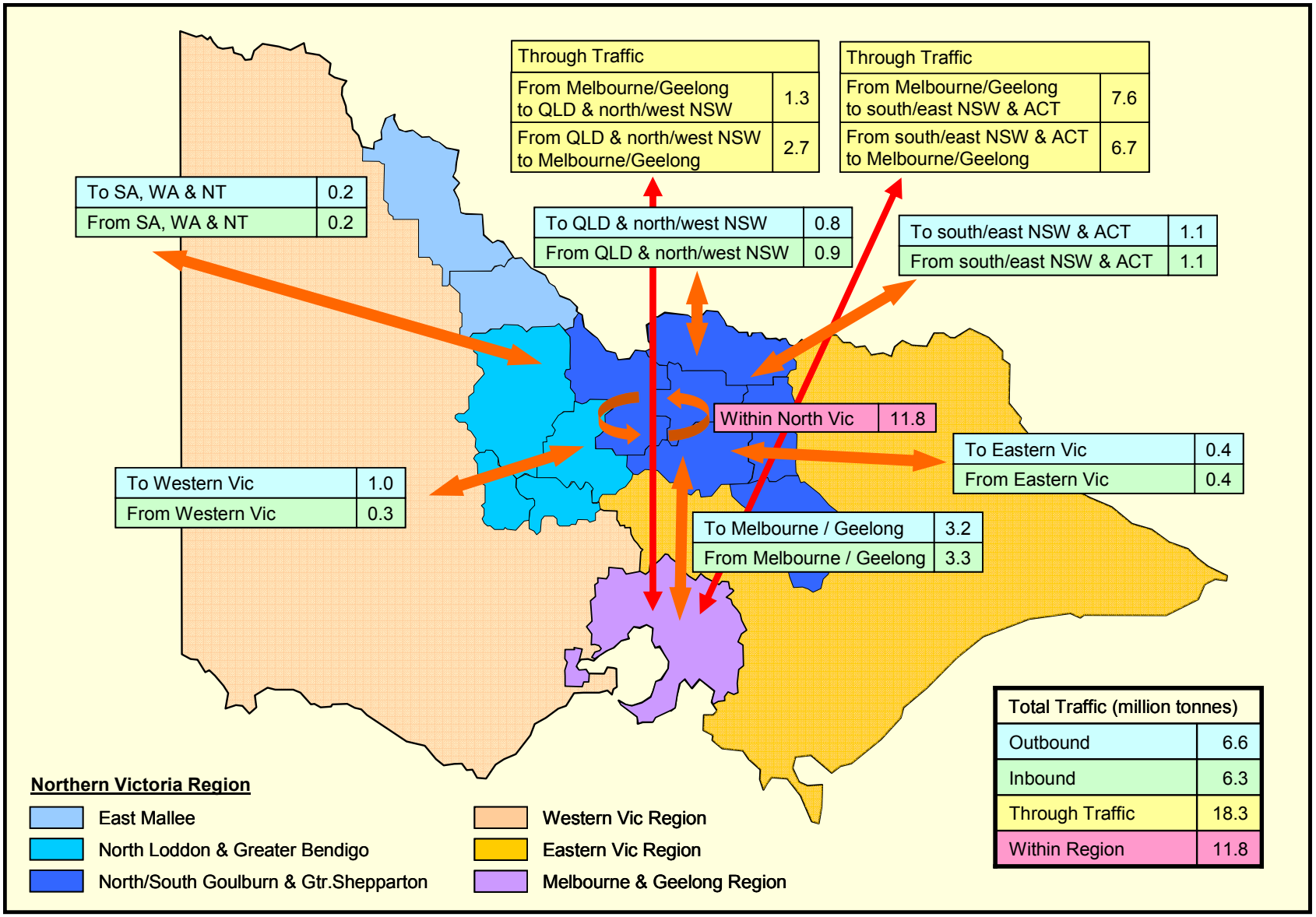
BTRE also estimates that between 2005 and 2030, traffic growth on the National Land Transport Network (NLTN) non-urban corridors in Victoria will average 1.8% per year which represents a 56% total increase (Source: BTRE Working Paper 75 - National Road Network Intercity Traffic Projections to 2030).

Whichever estimates and projections are used, the general consensus is that freight volumes will rise and at a rate in excess of the projected population increase.

Figure 4.2 below shows estimates of road freight in relation to the northern region of Victoria. The data is drawn from an analysis of 2001 ABS statistics applying an annual growth rate of 3% to estimate road freight in 2008.

Note that the geographical area of the northern district defined here does not coincide exactly with the shires that are the focus of this report due to limitations of the underlying ABS data being aggregated differently. The data includes the additional shires of Swan Hill, Greater Bendigo, Central Goldfields, Mount Alexander, Mansfield and Benalla. However, more than 50% of the total freight volumes in this region are contributed by the shires of Greater Shepparton, Campaspe and Moira and the patterns are very similar.

Figure 4.2 Northern Victoria Road Freight Volumes – 2008 estimates (million tonnes)



Conclusion – The Road Freight Task

Roads carry the majority of the freight task and although the largest freight routes are the through-routes between capital cities, there is a very significant road freight task within the region. This is largely driven by the haulage of primary produce (milk, fruit and vegetables and livestock) to processing facilities and distribution centres.

Public transport is insufficient to represent a viable alternative to personal vehicles for the majority of people, particularly in rural areas.

4.3 The Rail Network

The Victorian rail network comprises a regional network which is either broad gauge or standard gauge depending on the region and an interstate network which is standard gauge. The subject region is serviced for freight and passengers by the broad gauge network. There is currently no standard gauge rail link between the subject region and the national rail network.

The role of rail within the northern Victoria region can be divided into three categories

- Passenger traffic – Limited services are available to Melbourne from some towns in the region
- Containerised freight – Mostly processed food for export and containerised grain for export
- Bulk Freight – Dominantly grain

4.3.1 Interstate Rail Corridors

Melbourne to Sydney Corridor

The standard gauge rail line from Melbourne to Sydney does not currently service the region directly. It passes through Strathbogie Shire between Seymour and Benalla but has no stopping points for freight or passengers within the region. Planned standardisation of the second (currently broad gauge) track between Melbourne and Wodonga will provide passenger access at Euroa, Violet Town and Benalla. It will also result in standardisation of the grain line from Oaklands to Benalla.

The standard gauge network is owned by VicTrack and leased to the Australian Rail Track Corporation.

Melbourne to Brisbane Inland Corridor

Rail infrastructure along the Melbourne to Brisbane Corridor consists of a broad gauge track running from Seymour to Shepparton and on to Tocumwal in New South Wales. The Melbourne to Brisbane Rail Corridor has been identified by the Federal Government as a priority route for the movement of freight within Australia. The *ARTC has been charged with undertaking a feasibility assessment on the route options for the corridor with the study to be complete by August 2009.

The potential route alignment of the inland rail corridor through the northern Victoria region provides the region with the opportunity to expand the market base for their goods, offering a more efficient network for the movement of goods north to New South Wales and Queensland. This would necessitate standardising and upgrading the Seymour to Tocumwal rail line, thereby connecting the intermodal terminals at Tocumwal and Shepparton with the standard gauge network and providing opportunities for additional rail carriers to compete for these services.

4.3.2 Interstate Linkages – Murray River Rail Bridges

There are three rail bridges across the Murray within the subject region. The only other rail bridge across the Murray between Victoria and New South Wales is the crossing at Albury-Wodonga.

Tocumwal Rail Bridge

Opened in 1895. Steel structure. Bridge services the intermodal terminal and grain terminals in Tocumwal.

Echuca-Moama Rail Bridge

Opened in 1989 to enable the existing 1878 bridge to service road traffic only. Services grain lines from Moulamein and Deniliquin.

Yarrawonga-Mulwala Rail Bridge

Opened in 1989. Carries the Benalla-Oaklands grain line.

4.3.3 Intrastate Rail Network

The broad gauge line is the main rail system in operation through Victoria, providing both passenger and freight access to most areas within the state. Within the subject region, there is no access to the National standard gauge network.

The following broad gauge rail lines service the northern Victoria region:

Tocumwal – Shepparton - Melbourne

This line operates to transport bulk grains, containerised grain and other containerised freight from terminals in Tocumwal and containerised freight from the terminal in Mooroopna. It also provides the limited passenger service to Nagambie, Murchison East, Mooroopna and Shepparton.

- Melbourne – Seymour 99km
- Seymour – Shepparton 83km
- Shepparton – Tocumwal 70km

A 26km branch from Dookie connects to this line about 1km north of Shepparton. This line is exclusively used for bulk grain.

Deniliquin/Moulamein - Echuca - Bendigo - Melbourne

This line operates to transport bulk grains (including a significant volume of rice) form Deniliquin with additional silos at Mathoura and Barnes. It also provides the limited passenger service to Echuca.

- Melbourne – Bendigo 162km
- Bendigo – Echuca 88km
- Echuca – Deniliquin 73km

A branch from Moulamein connects to this line at Barnes (22km north of Echuca). This line has exclusively been used for bulk grain.

- Moulamein – Barnes 127km

Some freight is currently diverted on the line from Echuca to Toolamba and then south via Seymour due to daytime conflicts with passenger services between Bendigo and Melbourne.

- Echuca – Toolamba 67km

Piangil – Swan Hill - Bendigo - Melbourne

This line carries bulk grains. It also provides the limited passenger service to Swan Hill with stops at Kerang, Pyramid Hill and Dingee.

- Melbourne – Bendigo 162km
- Bendigo – Kerang 126km
- Kerang – Swan Hill 56km
- Swan Hill – Piangil 44km

Robinvale - Bendigo - Melbourne

This line is used for bulk grain transport and services the currently inoperative intermodal terminal at Boort.

- Melbourne – Bendigo 162km
- Bendigo – Korong Vale 81km
- Korong Vale – Boort 29km
- Boort – Robinvale 44km

Oaklands - Benalla - Melbourne

This branch line (126km from Oaklands to Benalla) is used for bulk grain transport. It is to be upgraded to standard gauge in order that it can remain connected to the network when the line from Melbourne to Albury is exclusively standard gauge.

4.3.4 Rail Freight Network Review

The Victorian Rail Freight Network Review (2007), undertaken by a committee led by the Hon Tim Fisher AC, identified a number of broad gauge rail lines as being critical to the continued growth of the Food Bowl region. These lines have been allocated 'Platinum', 'Gold', 'Silver' and 'Bronze' status in line with their priority to economic growth and service to regional Victoria.

Platinum status identifies a track that will continue to be maintained at a high level due to it being part of the V/Line passenger network, ARTC interstate network or declared AusLink network.

Gold status identifies a first priority section of the network for rehabilitation to original track classification that links with the platinum network to provide a sustainable rail freight operation.

Silver status refers to a high priority section of the network to be rehabilitated to original track classification conditional on grain industry collaboration and commitment.

Bronze status refers to the minimum maintenance for sections of the track not prioritised for rehabilitation at this stage. Should industry support and collaboration exist, these lines can be upgraded to silver status.

As indicated in Figure 4.3.4, the Swan Hill to Piangil and the Shepparton to Tocumwal freight lines have been identified as a route of economic significance to the region and will be upgraded to a gold level. The Dookie to Shepparton line, which operates during the grain harvest season, has been allocated bronze status under the review, as it provides an option for the grain industry to move product via rail, reducing the number of trucks on the surrounding local road network.

4.3.5 Safety – Rail Crossings

The Victorian Government has put in place a program to upgrade railway level crossings across the state to ensure that the safety of the community is not compromised. The program will see over $200 million spent across a 10-year period to upgrade 220 crossings within Victoria to improve the safety of pedestrian, road and rail traffic. The program involves changing crossings from passive to active crossings by replacing warning signs with boom barriers and/or flashing lights.

A number of crossings within the northern Victoria region have been identified as requiring an upgrade under the program along locations on the Murray Valley Highway, Midland Highway and the Northern Highway. Timing of works on these crossings will be allocated based on a risk assessment process using the Australian Level Crossing Assessment Model (ALCAM).

During 2008-09, the Railway Crossing Upgrade Program has resulted in upgrades to 45 level and pedestrian crossings and the installation of automatic advance warning signs at 22 sites. In addition, the Australian Government Boom Gates for Rail Crossings Program has allocated $30.3 million to improve safety at 59 high risk crossings over 2008-09 and 2009-10.

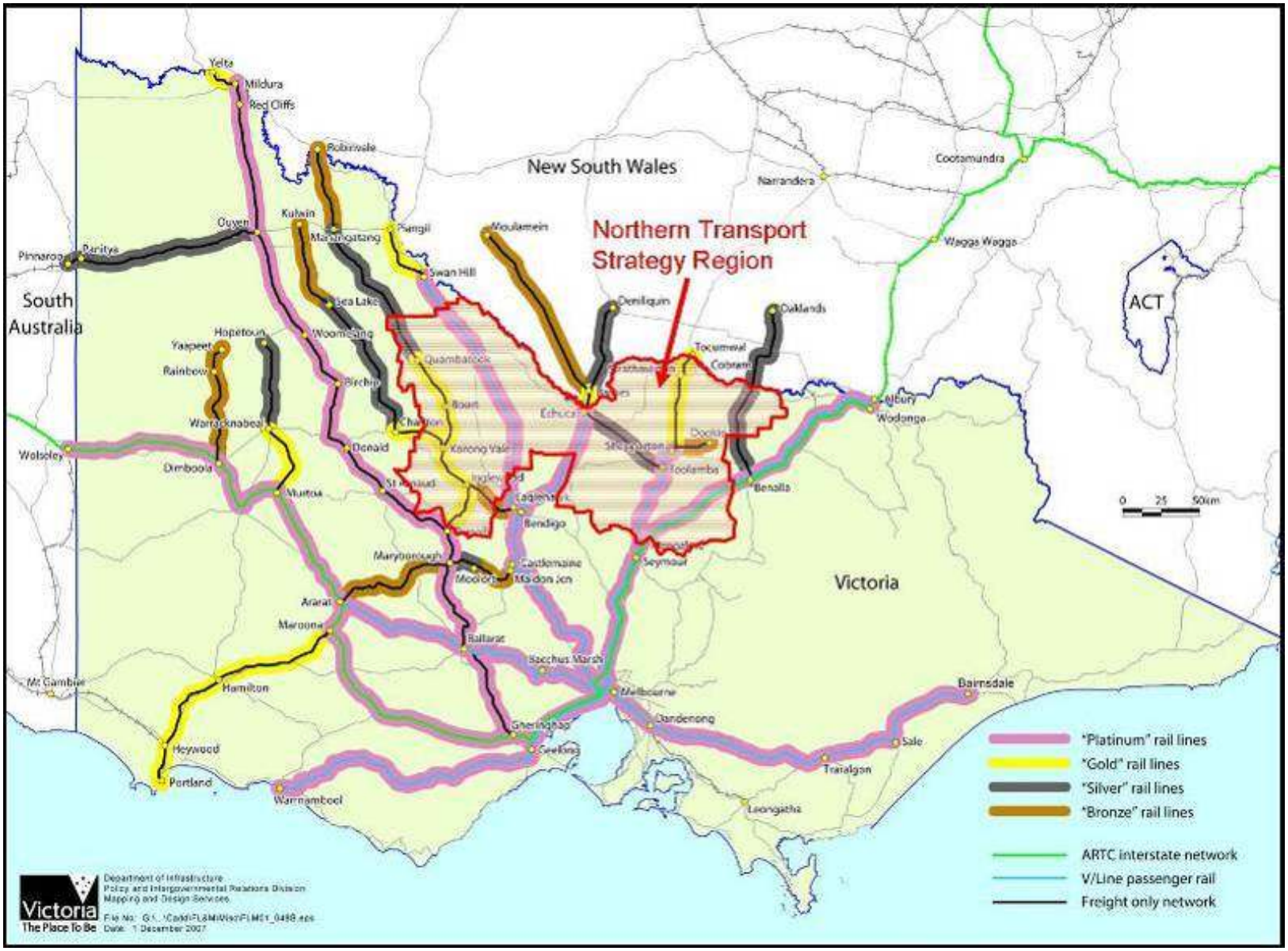
Recently VicRoads has installed rumble strips on all sealed road approaches to rail crossings as part of the State Government's safety improvement initiative. An 80km/hr speed limit has been applied to rail crossings. Trial sites are also in place to study the effect of speed restrictions on road approaches to rail crossings.

Conclusion – The Rail Network

Rail fulfils three niche segments in the transport task. Firstly it carries high volumes of grain from a long-established but recently threatened network of storage facilities and branch lines. Secondly, rail carries export bound containerised goods to the Port of Melbourne. Finally, rail passenger traffic remains on a very limited scale due to the poor frequency and speed of current services. Echuca has experienced significant growth in passenger rail usage since a daily service to Bendigo (and hence to Melbourne) was introduced in 2007.

The rail network in the region suffers from lack of standardisation, which limits the potential for connectivity interstate and limits the potential for a competitive commercial environment.

Figure 4.3.4 Victorian Rail Freight Network Review Recommendations (Source: Victorian Rail Freight Network Review, 2007 - annotated)



4.4 Rail Freight Task

Rail freight is carried across the broad gauge and standard gauge networks in Victoria.

The standard gauge network provides the interstate links between Melbourne and other capital cities and the freight network servicing south-western Victoria. The standard gauge mainline railway from Melbourne to Sydney follows the Hume Highway alignment via Wodonga and passes through the subject region but has no facilities for freight handling. Rail freight movement within the subject region is therefore restricted to the broad gauge network.

In regional Victoria, over five million tonnes of freight is transported by rail.

- Export grain (2 million tonnes average)
- Export containers (1.8 million tonnes)
- Crushed rock and cement (0.93 million tonnes)
- Domestic grain (0.3 million tonnes)
- Paper products (0.27 million tonnes)
- Logs (0.16 million tonnes)

(Source Switchpoint Victorian Rail Freight Network Review, 2007)

Within the subject region, rail freight is dominated by grain for the domestic and export market and containerised freight (mostly processed food) for export.

Bulk petroleum shipments have been made by rail to a terminal north east of Shepparton. This service is believed to have ceased in 2008.

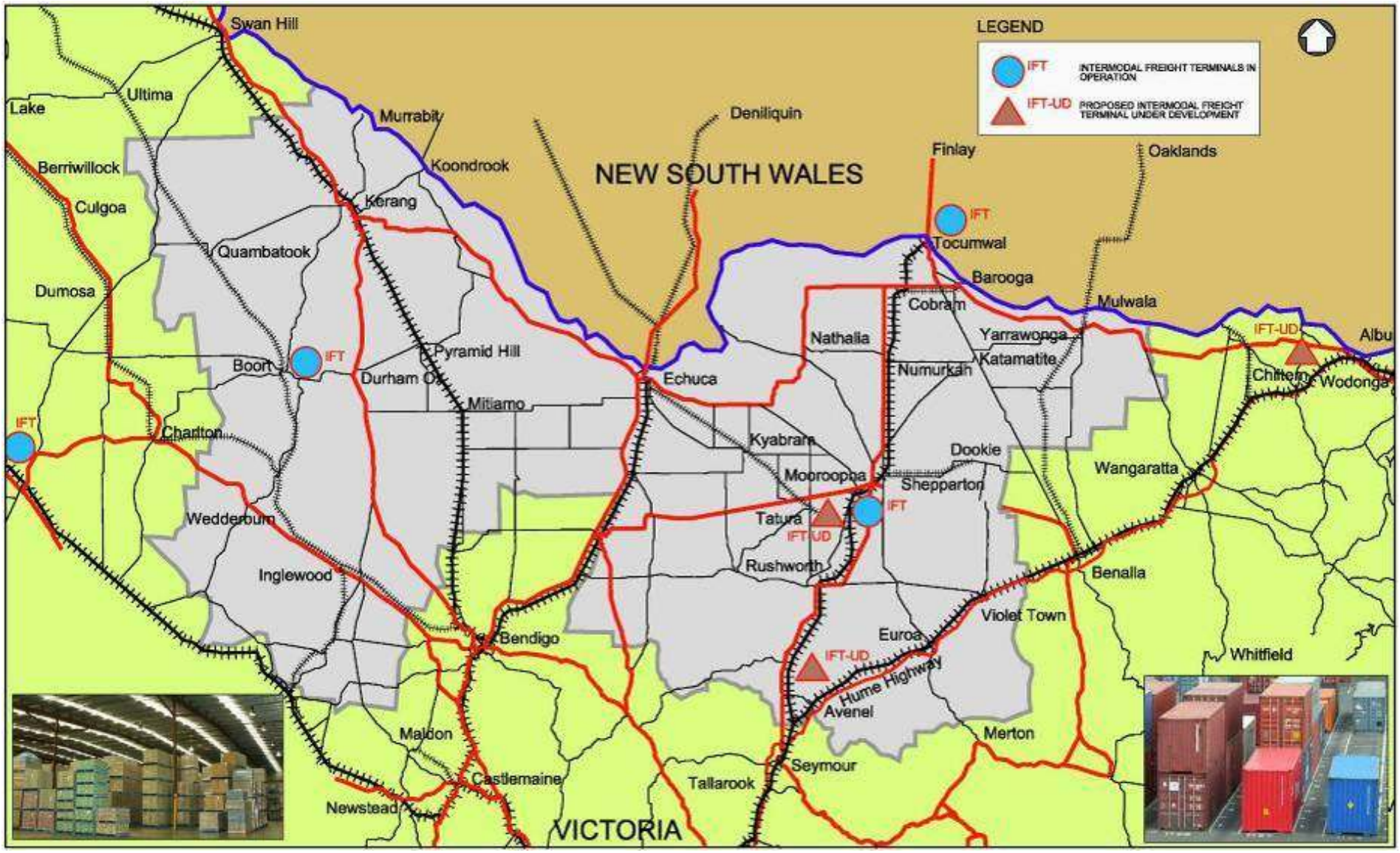
4.4.1 Intermodal Terminals

A network of efficient intermodal terminals is critical to providing the connection between road and rail transport modes and thereby increasing the proportion of freight that travels by rail.

A number of intermodal terminals have been established in Victoria (see Figure 4.4 below). Whilst the majority of attention has been focussed on terminals on the periphery of Melbourne, a network of linked intermodal facilities in key regional centres across the state would assist in the efficient movement of goods to and from the Port of Melbourne. The Food Bowl Region is currently serviced by two key intermodal facilities at Mooroopna near Shepparton and at Tocumwal. Mangalore has also been identified as a potential site for a future intermodal facility that is linked directly to both Melbourne and north to Sydney.

There are currently no common-user intermodal freight facilities on this part of the network, although containers of rice are loaded *in-situ on wagons at Deniliquin and a specialised facility exists at Boort (currently closed due to drought-related downturn in volume). The majority of rail freight on this portion of the network consists of the movement of grains to the ports of Melbourne and Geelong Figure 4.3.4 above identifies key freight rail lines within Victoria and the Food Bowl.

Figure 4.4 Intermodal Facilities (Source: Department of Transport, Victoria)



4.4.2 Existing Intermodal Facilities

Shepparton / Mooroopna

The intermodal facility at Mooroopna is operated by Patrick Portlink (Asciano). The facility is used predominantly to move containerized goods from regional food processing industries. The main goods shipped through the facility are canned goods from SPC/Ardmona, dairy products from the Kraft facility and rice from New South Wales.

The facility is connected via the broad gauge line to Melbourne. Approximately 90% of the product moved by rail goes to the Port of Melbourne for export and the other 10% to Western Australia. The facility has handled over 24,000 TEU (total incoming and outgoing) per annum. Current volumes are somewhat les due to reduced agricultural output during the drought and due to several food processors switching to road freight.

Tocumwal

While technically outside the subject region, the Tocumwal intermodal terminal lies immediately across the NSW border and has strategic importance to the region. The Tocumwal intermodal facility is operated as Gray's Container Terminal. The facility handles both containers and bulk goods utilising the existing broad gauge rail line and the road network. The main goods shipped through the facility are dairy products, timber, stock feed and cereals (oats and grain).

The intermodal facility captures rail connections 50km into Victoria and 200 km into southern NSW.

Boort

The intermodal facility at Boort is connected to the Port of Melbourne via the broad gauge rail line and was operated by Wimmera Container Lines.

In 2006, the facility handled over 8,500 TEU containers – mostly hay for export. The facility ceased operating in 2008 due to drought-related decline in the volume of export hay.

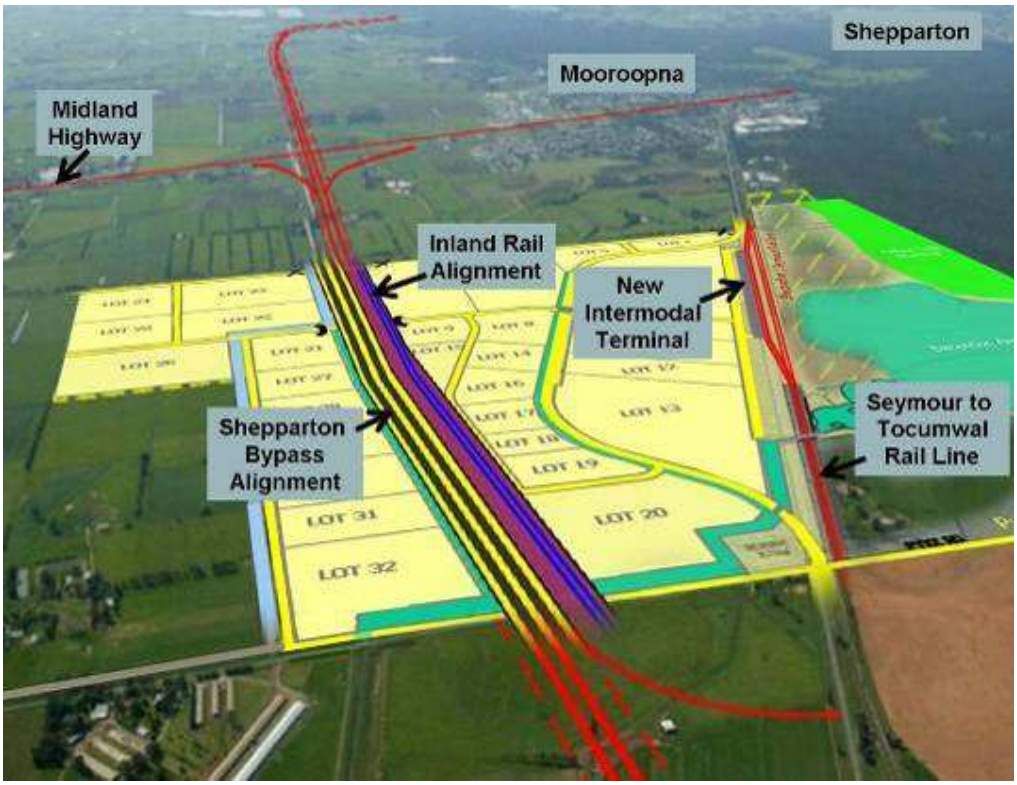
4.4.3 The Goulburn Valley Freight and Logistics Centre

A site for the Goulburn Valley Freight and Logistics Centre (GVFLC) has been identified by the Greater Shepparton City Council. The facility is intended to be a regional centre for freight handling and logistics and ultimately to function as an inland port. The centre will include complimentary freight and storage services combined with a road-rail terminal.

Large concentrations of food processing and related industries are located nearby such as SPC/Ardmona, Tatura Milk Industries, and Heinz Girgarre. The centre will be built on a 331 hectare site at 250 Toolamba Road, which is two kilometres south of the Midland Highway at Mooroopna and is 180 kilometres north of Melbourne (See Figure 4.3.2). Greater Shepparton City Council is currently working through the design component of stage 1, which comprises 4 allotments measuring 22 hectares in total. The intermodal terminal is expected to be developed in stage 3.

The GVFLC has a strong alignment with AusLink criteria, State Government objectives to increase the proportion of freight carried by rail to the port, industry based guidelines and Council objectives. Work undertaken by Price Waterhouse Coopers has identified the capital requirements for the terminal, which will likely involve a Federal Government funding contribution of $10 million, state funding of up to $5 million and $2.5 million to be contributed by the Council. The location of the centre closely aligns with one of the options for the proposed Melbourne to Brisbane inland rail corridor. Selection of this route will open up new markets to the region and focus the centre as the key freight hub in the region. In 2000-2001, 12,000 TEU containers of canned and processed food were transported from Shepparton to the Port of Melbourne for export *(DOT 2008). With the freight task expected to double *(NTC 2006) by 2020, and the State Government policy to increase the share of rail for the transport of freight to 30%, the centre is expected to be a major driver in expanding the export market for the region. The GVFLC is expected to replace the intermodal facility at Mooroopna once it is fully operational.

Figure 4.3.2 Goulburn Valley Freight and Logistics Centre Development Plan



The benefits generated by the Goulburn Valley Freight and Logistics Centre are:

- Contribution to the Gross Domestic Product of approximately $55 million during the project's construction and subsequent operation;
- Savings in road maintenance expenses of up to $3 million over the project's life;
- Creation of conditions necessary for efficiency improvements in business operation and logistics value chains and overall economies of scale;
- Quantifiable environmental benefits worth up to $1.5 million over the project's life through reduced air pollution, greenhouse gases, noise pollution and water pollution;
- Up to 10,000 less truck trips and 5,000 tonnes of greenhouse gas emissions per annum over the project's life;
- Quantifiable social benefits worth up to $2 million over the project's life from reduced impacts on nature and landscape's urban separation, congestion and accident costs;
- Contribution to employment (for 475 people, 170 directly in the construction industry and a full time equivalent of up to 20 positions during operation);
- Improvements to the City of Greater Shepparton's employment quality, business diversity and the associated effects on land use and transport routes in and around Shepparton.

4.4.4 Proposed Intermodal Terminal at Mangalore

A separate potential freight and logistics centre site currently under consideration is the Mangalore Food and Logistics Precinct, in the Shire of Strathbogie. The site is located at the junction of the Hume Freeway and Goulburn Valley Highway. The centre would support the nearby industries such as piggeries and broiler farms, processing and packaging warehouses and other intermodal freight facilities based around the Mangalore airport.

Conclusion – Rail Freight Task

Rail freight has clear advantages over road freight in reducing road traffic, improving public safety and reducing environmental impacts.

Rail is challenged by the need for point to point transfers of freight and the cost of switching from road to rail. When the transport distance is short, the cost and time required to transfer to goods to rail can more than offset and cost savings associated with the inherent efficiency of rail transport.

The infrastructure required to facilitate rail freight is capital intensive and it remains difficult to ensure a competitive market for rail freight services. This is exacerbated by the seasonal and cyclical demand for freight volumes which makes it difficult for private investors to maintain capacity of fixed infrastructure and rolling stock. There must clearly be public ownership of critical rail assets in order to ensure the future of rail freight.

There is great potential for improvement to the efficiency of the outbound logistics chain through strategically located intermodal terminals, linking to the Port of Melbourne and to long-distance major destinations. Since these facilities must be common user facilities, there must be some centralisation of planning and injection of public funds for infrastructure.

Proposed intermodal terminals should continue through their next stages of planning which should include coordination between proposed projects.

4.5 Public Transport

4.5.1 The Need for Public Transport

Public transport can be utilised for a variety of travel needs including commuting to work, attending school or higher education, shopping, accessing professional services (such as health care, financial and legal services), recreation and social purposes.

In large cities, public transport is often a preferred mode of transport for a wide range of the population. It can avoid the uncertainties and stress of traffic congestion, avoids the difficulty and cost of finding convenient parking and can be a faster mode of travel overall. In regional and rural areas however, many of the problems associated with personal vehicles are not as apparent and public transport is more often utilised by those who have no other choice. Hence public transport services, where they exist in rural areas, tend to be used by those who are least able to pay for them.

If we are to retain and strengthen the health of our regional and rural communities, we must consider both the opportunity to encourage more of those people with a choice to switch to public transport and make better provisions for those who do not have the choice. By doing both, we will increase the utilisation of services which will make their provision more financially viable.

4.5.2 The Benefits of Public Transport

The benefits of increased public transport can be summarised with a triple bottom line framework as follows.

Social / Community Benefits

Many people have little choice but to rely on public transport. Young, old and disabled people may not be able to drive themselves. Many people cannot afford their own vehicle. Many families share a single vehicle but have competing needs.

While some people are able and willing to avoid the need for public transport and live in close proximity to the services they require, this is not always possible or desirable. For example, it can be socially (and health-wise) advantageous for ageing or disabled people to remain living in their rural communities where they have established networks of friends and relatives but this does not diminish their need to travel to regional centres for access to healthcare and other services.

Economic Benefits

A frequent, fast and reliable public transport system will attract individuals, businesses and investors to our region and will thereby contribute significantly to economic development. Higher use of public transport reduces the need for public expenditure on roads and car parking. Using public transport has health benefits because it is usually associated with increased walking or bicycling at each end of the journey. This health benefit has both economic and social outcomes.

Environmental Benefits

Public transport is usually more efficient in terms of energy consumed and emissions created for collective passenger journeys.

4.5.3 Existing V/Line Passenger Coach Services

V/Line coach services operate extensively throughout Northern Victoria and most towns within the subject region are included along the V/Line coach routes.

Coach services provide multiple roles:

- Connecting smaller communities that are not serviced by rail
- Connecting to rail stations as a means for connection to larger centres and to Melbourne
- Providing increased frequency of services between centres also serviced by rail

Every town within the northern region with a population over 1,000 have access to a V/Line coach service. Of towns with populations between 500 and 1,000, the majority have coach services or are in the close proximity to a town with a coach service.

However, while coach services may exist to service many towns and to bolster service frequencies, the service is mostly too slow to be considered an option for business travel. As an example, the coach service between Shepparton and Melbourne (utilising rail from Seymour to Melbourne) adds two services per day to the three train services but takes 2 hours and 48 minutes – approximately 25% longer than typical driving time.

Figure 4.5 shows the V/Line rail and bus passenger network for Victoria.

4.5.4 Existing Bus Services

A number of private bus companies operate a combination of school bus services, regular passenger services and bus charters in the region.

Greater Shepparton Transit operates 9 bus routes in Shepparton, 2 in neighbouring Mooroopna and a connection between the two.

Yarrawonga has 2 bus routes and a connection service to Mulwala.

Echuca Moama Transit operates a service connecting several locations in the two townships.

Fallons operates a daily service between Bendigo and Shepparton with stops in Kyabram, Lancaster, Merrigum, Byrneside, Tatura and Mooroopna.

Cobram has a local service on Tuesdays and Fridays operated by Thompson's Bus Lines.

In Loddon Shire, B-Line consists of 3 trial bus services between Bendigo-Boort, Tarnagulla-Inglewood and Tarnagulla-Maryborough. B-Line is a result of the State funded Transport Connections initiative.

In Gannawarra, the Transport Connections initiative has resulted in the Quambatook Lalbert Community Bus travelling to Boort, Kerang and Swan Hill, the Lalbert to Swan Hill bus and is investigating a service between Kerang and Echuca.

A number of private companies operate shuttle services to Melbourne (Tullamarine) Airport. Airport Direct has two services each way daily from Shepparton with a stop in Nagambie and a service from Wodonga with a stop in Euroa.

4.5.5 Existing Passenger Rail Services

V/Line is responsible for the maintenance and operation of the regional rail network, whilst Australian Rail Track Corporation* is responsible for those portions of routes that form part of the defined interstate rail network.

Northern Victoria is relatively underserved by passenger rail services. There are four rail lines connecting passengers from the northern Victoria subject region to Melbourne. (See Figure 4.5)

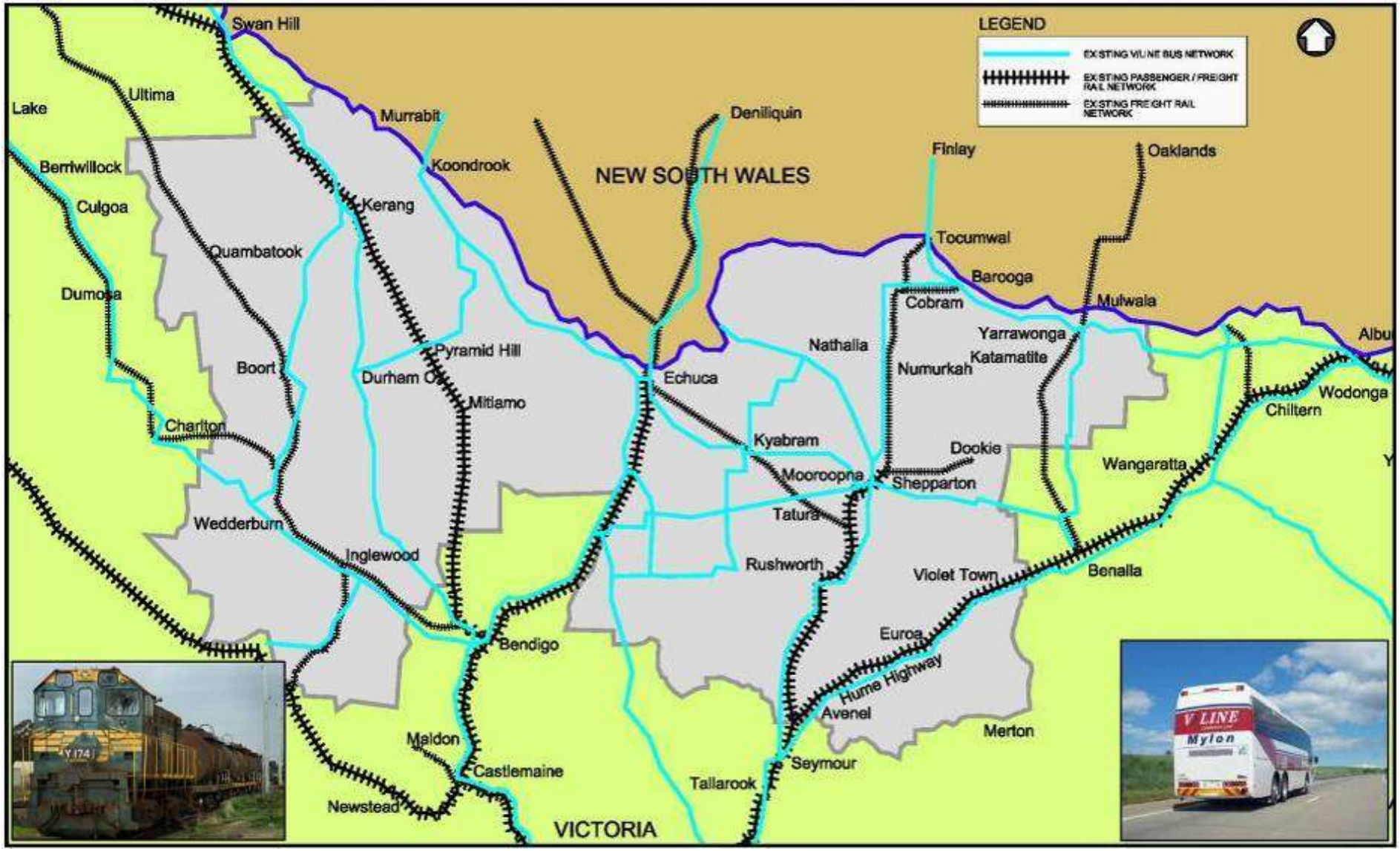
Note: Populations quoted below are for comparable ABS statistical areas for the respective cities.

- Shepparton (est. 2007 population 46,680) connects via Seymour with services from Shepparton, Mooroopna, Murchison East, and Nagambie.
  There are currently three train services (two on weekends) in each direction per day.
  The earliest train doesn't arrive in Melbourne until 9:28am.
  The only train to depart Melbourne after 5pm is at 6:33pm.
  Journey time for 182km from Shepparton to Southern Cross station averages 2hours 27minutes, an average speed of 74 kmph.
  This service had an increase in patronage of 7% in 2008-2009.
- Echuca (population 12,115) connects via Bendigo with services from Echuca and Rochester.
  There is currently one train service (two on weekends) in each direction per day.
  The only inbound train arrives in Melbourne at 10:44am.
  The only outbound train departs Melbourne at 3:15pm.
  Journey time for 250km from Echuca to Southern Cross station is 3hours 24minutes, an average speed of 74 kmph.
  This service had an increase in patronage of 12% in 2008-2009.
- Kerang connects via Bendigo on the Swan Hill line with services from Kerang, Pyramid Hill and Dingee. There are currently two train services in each direction per day including weekends.
  The earliest train arrives in Melbourne at 11:31am.
  The only train to depart Melbourne after 5pm is at 6:17pm.
  Journey time for 289km from Kerang to Southern Cross station averages 3hours 31minutes, an average speed of 82 kmph.
  The Bendigo-Swan Hill line had an increase in patronage of over 38% over the last two years.
- The Albury line connects via Seymour and until November 2008 serviced Violet Town, Euroa and Avenel (Strathbogie). Due to the standardisation of the Albury to Seymour line, the service has been temporarily replaced by a coach service. A passenger train service is expected to resume in 2010. The standard gauge portion of the corridor links Sydney to Melbourne with an *XPT service that operates two services daily, to and from Melbourne via Benalla, Wangaratta and Albury, then passing through southern New South Wales to terminate in Sydney.

By contrast, looking at other regional centres in Victoria:-

- Bendigo (est. 2007 population 86,510) is serviced by 17 trains in each direction per day with four services arriving in Melbourne before 9am and eight departing Melbourne after 5pm.
  Journey time for 162km from Bendigo to Southern Cross station averages 1hour 53minutes, an average speed of 86 kmph (as little as 1 hour 24 minutes and 116 kmph for the fastest service).
- Ballarat (est. 2007 population 89,665) is serviced by 16 trains in each direction per day with five services arriving in Melbourne before 9am and six departing Melbourne after 5pm.
  Journey time for 119km from Ballarat to Southern Cross station averages 1hour 19minutes, an average speed of 90 kmph (as little as 1 hour 4 minutes and 112 kmph for the fastest service).
- Traralgon (est. 2007 population 28,833) is serviced by 18 trains in each direction per day with four services arriving in Melbourne before 9am and five departing Melbourne after 5pm.
  Journey time for 158km from Traralgon to Flinders Street station is 2hours 15minutes, an average speed of 70 kmph (as little as 1 hour 56 minutes and 82 kmph for the fastest service).
- Even Bairnsdale (population 7,796) is serviced by three trains in each direction per day
  Journey time for 275km from Bairnsdale to Flinders Street station is 3hours 35minutes, an average speed of 77 kmph.

Figure 4.5 V/Line Bus and Rail Network (including freight rail network)



4.5.6 Deficiencies in Public Transport

In the Northern region, the public has expressed generally higher than state average limitation of the transport system. Figure 4.5.6 below provides indicative data from a 2007 state-wide survey.

Figure 4.5.6 Transport Limitations Indicator

People who Experienced Transport Limitations in the Last 12 Months (% of adult population)						
Campaspe	Gannawarra	Greater Shepparton	Loddon	Moira	Strathbogie	State Average
22.5%	20.9%	13.3%	25.7%	18.1%	31.2%	20.3%

Source: 2007 Community Indicators Victoria Survey

This data clearly indicates that the limitations are felt more acutely in the more sparsely populated areas. However, it does not reflect the opportunity for shifting people from personal vehicles since it is unlikely that respondents in regional and rural areas would consider it a limitation that they do not have the choice of taking a bus to work rather than using their own car.

There are two main types of deficiency which should be addressed in the public transport system.

The first deficiency is the lack of sufficient high-quality services to encourage a modal shift from personal cars to public transport. This deficiency can be addressed by the provision of higher frequency rail and bus services, improved infrastructure and improved modal connections targeting commuters, students, business travellers and shoppers.

The second deficiency is the lack of services for those who do not have the means or ability to drive their own car. This deficiency can be addressed by extending available networks, particularly those that connect regional centres to surrounding smaller communities.

4.5.7 Transport Connections

Transport Connections is a Victorian Government funded joint initiative of the Department of Planning and Community Development, Department of Transport, Department of Human Services and Department of Education and Early Childhood Development. Transport Connections establishes paid local coordinators and working groups to assess local needs and find innovative solutions using existing infrastructure such as under-utilised school buses and other community vehicles.

There are 32 Transport Connections Program Sites across Victoria. Of relevance to the subject Northern Victoria region are the following Transport Connections Programs:

- Southern Mallee Transport Connections Project serving Gannawarra, Swan Hill and Buloke.
- BLINE – Getting around Bendigo and Loddon – serving Greater Bendigo and Loddon
- Goulburn Valley Transport Connections – serving Moira, Greater Shepparton and Strathbogie
- Transport Campaspe - serving Campaspe

Community Transport programs seek transport solutions for frail aged people and those with a disability under the Home and Community Care (HACC) program. In various areas the program runs busses to regional centres and coordinates the use of other local transport assets.

With an ageing population there is scope and justification for increased resources and geographic expansion of Community Transport programs and a need to streamline the requirements and accessibility to a wide range of limited transport resources.

4.5.8 Public Funding of Public Transport

In large cities, public transport can be financially more effective. Distances are often short due to population density. Passenger volumes are large which results in high asset utilisation rates. The alternatives to public transport can be costly (parking fees) and inconvenient or stressful (traffic congestion) resulting in passengers being willing to pay higher costs for transport.

In regional and rural areas, public transport is more challenged. Distances can be large and populations are less dense. Using personal vehicles is relatively cheap and convenient which means that the economically advantaged population often feels little need for public transport and this further reduces demand density. The net result is that public transport in regional and rural areas is often used predominantly by those who are most socially, medically or economically disadvantaged.

It is therefore very difficult for privately funded public transport to be economically viable in regional and rural areas beyond isolated cherry-picked cases of bus services in the larger regional centres. The economic benefits of public transport are often indirect (health, reduced congestion) or not derived by those who might bear the cost of providing the service (reduced cost of roads, car parks).

Conclusion – Public Transport

Public transport is currently insufficient to represent an attractive or viable alternative to personal vehicles for the majority of people, particularly in rural areas. For those without the option of their own personal vehicle, the lack of public transport can result in isolation, inability to access services or the requirement to relocate to a regional centre.

The regional centres of Northern Victoria are underserved by passenger rail services when compared to other parts of the Victoria. North of Bendigo and Seymour, the frequency and speed of service drops to a level that few travellers even consider rail as an alternative to driving. Significant business and leisure traffic volumes could be switched from road to rail if the frequency and speed of service were to be improved – particularly for train services to Melbourne from the larger population centres of Shepparton and Echuca.

In smaller rural centres such as Kerang, there is an even greater lack of public transport options.

While there are social, economic and environmental benefits of public transportation, the economic benefits are not usually derived directly by those who pay to provide the services. Therefore, the provision of public transport must be a conscious strategic decision and improvements will require public funding.

The success of Transport Connections initiatives indicates that there is some scope for innovative solutions using existing assets to improve service provision. This program should continue to receive funding and backing by the State and local governments. Specific assistance might be given through community access to school busses where capacity is available.

4.6 Aviation

A number of aerodromes service the northern Victoria region, with most providing charter passenger services and some freight services. There are currently no regular passenger services operating from any airport in the region.

The main aerodromes in the northern Victoria area are located at Mangalore, Shepparton, Yarrawonga and Kerang (see figure 1.2). They are summarised below.

Mangalore has the best facilities of the aerodromes in the region, with two sealed runways of length 2,027m and 1,461m. It has a high standard of runway lighting, navigational equipment and an operational control tower. Mangalore Airport has been developed significantly for flight training with Kestrel Aviation and the Civil Aviation Training Academy which can accommodate residential pilot training.

The Shepparton Aerodrome has an 1,380 metres main sealed runway and a 423 metre gravel runway. Users include two flying schools, emergency services (including the Air Ambulance), the Goulburn Valley Aero Club, air couriers, charter, private and business operators. A regular passenger service between Shepparton and Sydney has been attempted at several times in the past, but there was insufficient, consistent demand for the service to remain viable. The Council has undertaken feasibility studies regarding re-location of the aerodrome to an area with lower residential density and has decided that it should remain in its current location for the foreseeable future.

Echuca Aerodrome has a 1,102m sealed north-south runway and a 510m gravel east-west runway.

Kerang Aerodrome is on the outskirts of town and has landing facilities for light aircraft. The main runway is sealed and 1,067m long.

Yarrawonga Aerodrome encompasses 130 hectares of land and is close to major tourism/holiday attractors (e.g. the Murray River and Lake Mulwala). The aerodrome has a sealed 1,150 metre runway with a pilot activated light (PAL) system and freehold hangar sites. The aerodrome has potential for future growth and is on Council owned land providing protection from encroachment by residential developments. Yarrawonga has excellent weather patterns and flat terrain for safe approach and takeoff.

Conclusion – Aviation

Aerodromes in the region are relatively basic and primarily oriented towards general aviation.

There are no scheduled air passenger services operating within the region.

Many of the aerodromes have pilot training facilities and have the advantage of good weather and low traffic volumes compared to Melbourne.

Mangalore has been developed the most for pilot training.

Yarrawonga and Echuca offer potential for aviation based tourism due to their proximity to Murray River attractions.

SUMMARY SECTION 4 – Existing Transport System

Section 4 identifies the key networks within the region and provides the link for the projects identified by stakeholders during the workshops to the assessment framework tool to prioritise projects within the region and drive beneficial outcomes for safety, social, economic, and environmental objectives.

Road	Increased traffic volumes and increased proportions of heavy vehicles on high traffic routes drive a need for bypasses and duplication in key locations. At a local level, municipalities struggle to maintain the local network due to financial constraints.
Rail	Standardisation of key rail lines will be necessary to enable connectivity with the national network. Until that time, rail freight is likely to be limited to freight to the Port of Melbourne and Geelong for export. Increased frequency of service and increased train speed will be necessary to raise the usage of rail for passengers from key regional centres of Shepparton and Echuca. Efficient intermodal terminals will enable users to access rail and logistics services and improve transport efficiency while contributing to the generally desirable modal shift from road to rail.
Public Transport	Public transport has social, health, economic and environmental benefits. However, the economic benefits are often indirect and public transport requires public funding in smaller regional and rural areas. Despite these benefits, public transport in regional and rural areas is primarily utilised by those who do not have the choice to drive their own vehicle. The situation is exacerbated by significant deficiencies in the public transport system becoming increasingly acute for smaller communities. The major regional centres of Shepparton and Echuca have very poor train service connections to Melbourne and most other communities have none. While there is a V/Line coach network, outside the major centres, there are very limited bus alternatives to connect rural communities with their regional centres for access to critical services.
Aviation	Small aerodromes service general aviation needs in all the larger townships within the region. There are no scheduled passenger services at this time. There is potential for growth in pilot training, and specialty freight services which could drive a need for improved infrastructure.

CONCLUSION - SECTION 4 – Existing Transport System

Roads

The northern Victoria road network is ageing (as noted by the table of local road sustainability in section 4.1.5) and is being exposed to increasing traffic volume and higher loads. This combination is leading to increased degradation of the road network with increased incidence of road failures.

Traffic data shows that the arterial road network, such as the Hume Highway, Goulburn Valley Highway, Northern Highway, Midland Highway and the Murray Valley Highway provide key links for passenger and freight traffic within and through the northern Victoria region. Each of the municipalities in this region has key local roads that provide links to the main state and federal road system. These local roads provide the strategic links for local industry and rural sectors to the manufacturing and distribution bases in larger regional centres and in capital cities.

(Continued over page)

Rail

Increased maintenance of the freight-only rail network has started to address its condition since the state resumed control of the regional rail network in 2007.
For freight within the region, the relatively short distances mean that reliability of service and connectivity are more important than maximum train speed.
Standardisation of key lines (initially Seymour to Tocumwal and Bendigo to Deniliquin) will provide freight access to the national network and will provide competition amongst rail service providers. The routing of the Melbourne to Brisbane Inland Rail Corridor through the Food Bowl within the Goulburn Valley would be an additional catalyst for standardisation of the Seymour to Tocumwal line.

For passengers, rail transport will remain underutilised until there are sufficient services to enable rail travel to fit business schedules. A faster trip would also encourage travellers when rail becomes as fast as or faster than, the equivalent trip by driving a personal vehicle.

Intermodal terminals enable a modal shift from road to rail. When coupled with additional logistics facilities, they could significantly improve transport efficiency by enabling load consolidation.

Public Transport

The health of our communities would benefit from increased availability and usage of public transport, both by those who have no alternative and by those who choose public transport over personal vehicles. In order for public transport options to be chosen, the availability, reliability and frequency of services must be increased in almost all areas of the region. Particular needs are for improved rail services to Melbourne and improved bus connections between rural and regional centres for those with limited transport options.

Public funding and local government action will be required to expand services and provide infrastructure to encourage higher utilisation of public transport and to expand services for use by disadvantaged segments of the population.

Aviation

Aviation infrastructure is expensive relative to the demand and is likely to remain little changed other than where unique opportunities to capitalise on existing infrastructure exist.

ACTIONS – SECTION 4 – Existing Transport System

A4.1	Continue to monitor the sustainability figures for each of the network's assets and work towards 100% renewal funding.
A4.2	Continue to improve the network data relating to freight movements.
A4.3	Undertake a full audit of regional safety issues and feed this information into the next review of the strategy.
A4.4	Develop next stage project scopes for each of the intermodal facilities identified in the strategy.
A4.5	Develop a lobbying strategy for increased service frequency and faster trains for passenger rail to Shepparton and Echuca and the introduction of a service to Cobram.
A4.6	Develop a lobbying strategy for the Goulburn Valley Highway by-pass projects in conjunction with the Goulburn Valley Highway Action Group.
A4.7	Develop a strategy to promote timely construction of the second bridge at Echuca.

5.0 Objectives

Objectives are statements defining the desired outcomes. The objectives are derived from the established values and vision through consideration of the drivers of transport demand and the current transport network discussed in the previous sections of this report.

The management committee has agreed to each of the objectives to ensure compliance with the overall values that represent the northern Victoria region.

Each objective is linked to a strategy that is consistent with the government guidelines for funding.

The following objectives were identified as being appropriate for the Regional Transport Strategy:

Objective 1	**Enhanced safety of the transport network**
Objective 2	**Removal of through traffic (particularly heavy goods traffic) from built-up residential areas e.g. Nagambie, Shepparton, Echuca**
Objective 3	**Preserved and enhanced community amenity**
Objective 4	**Transport infrastructure of appropriate standards for industry**
Objective 5	**An improved regional heavy vehicle road network to facilitate the movement of goods**
Objective 6	**Improved infrastructure to support rail freight movement**
Objective 7	**Improved network access and infrastructure to support the logistics chain**
Objective 8	**A transport network that better supports tourism**
Objective 9	**A safe, fast and efficient road and rail passenger network**
Objective 10	**Other appropriate people movement infrastructure e.g. airstrips for air ambulance, bike tracks, taxi ranks, bus interchanges**

6.0 Strategies

Strategies have been developed for achieving the objectives based on the conclusions of the drivers of transport demand and the existing transport network. Each of the strategies helps to achieve a number of objectives for the region.

Through the workshops with stakeholders, a number of key strategies linked to the vision, values and objectives have been agreed for the Regional Transport Strategy. Key stakeholders were identified, including local industry leaders, and their opinions sought as to the best solutions for their transport and logistics requirements

Each strategy is supported by a range of sub-strategies, which will be implemented through a number of actions, identified during stakeholder consultation.

Strategy 1 - Provide safety upgrades to transport networks

Strategy 2 - Maintain and upgrade key roads to support freight and people movement

Strategy 3 - Create road by-passes around major towns

Strategy 4 - Further develop road-based public transport

Strategy 5 - Improve access to key tourism and recreation areas

Strategy 6 - Develop and standardise the rail network

Strategy 7 - Develop rail freight infrastructure

Strategy 8 - Improve frequency, speed and safety of passenger rail services

Strategy 9 - Further develop regional airports

6.1 Linkage between Objectives and Strategies

The strategies are closely tied to objectives. Table 6 shows the linkage between the strategies and the multiple objectives which they support. This table demonstrates that there is at least one strategy aimed at achieving each objective and that all strategies support at least one objective.

Table 6 Alignment between the strategies and the objectives

	Objectives									
Strategies	Enhanced safety of the transport network	Removal of through traffic (particularly heavy goods traffic) from built-up residential areas	Preserved and enhanced community amenity	Transport infrastructure of appropriate standards for industry	An improved regional heavy vehicle road network to facilitate the movement of goods	Improved infrastructure to support rail freight movement	Improved network access and infrastructure to support the logistics chain	A transport network that better supports tourism	A safe, fast and efficient road and rail passenger network	Other appropriate people movement infrastructure
Provide safety upgrades to transport networks	●	●	●	●						●
Maintain and upgrade key roads to support freight and passenger movement	●	●		●	●	●	●			●
Create road by-passes around major towns	●	●	●	●	●				●	
Further develop road-based public transport										
Improve access to key tourism and recreation areas			●					●	●	●
Develop and standardise the rail network						●	●		●	
Develop rail freight infrastructure				●		●	●			
Improve frequency, speed and safety of passenger rail services	●		●					●	●	
Further develop regional airports				●		●	●			●

Strategy 1 - Provide safety upgrades to transport networks

Strategy 2 - Maintain and upgrade key roads to support freight and people movement

Strategy 3 - Create road by-passes around major towns

Strategy 4 - Further develop road-based public transport

Strategy 5 - Improve access to key tourism and recreation areas

Strategy 6 - Develop and standardise the rail network

Strategy 7 - Develop rail freight infrastructure

Strategy 8 - Improve frequency, speed and safety of passenger rail services

Strategy 9 - Further develop regional airports

Strategy 1 - Provide safety upgrades to transport networks

The development and maintenance of a safe transport network throughout the region is a priority.

It is essential that each council works in partnership with key stakeholders (i.e. Vic Roads, DOT, Police, Public Transport Safety Victoria etc.) to improve the safety of both the road and rail network.

Councils are the co-coordinating authority of assets under the Road Management Act for local roads and VicRoads for arterials roads. Both are required to co-ordinate the use of the road reserves including the installation of various road and utility infrastructures so as to:

- Ensure the safety of road users and the community;
- Minimise disruption and inconvenience to road users;
- Protect the environment;
- Protect the physical integrity of the road and infrastructure in the road reserve.

This strategy should include the following elements;

S1.1 Intersection improvements
S1.2 Bridge widening / strengthening
S1.3 Overtaking opportunities
S1.4 Rest stops
S1.5 Upgrade unsealed roads
S1.6 Timely Asset Renewal
S1.7 Improve safety of rail/road crossings
S1.8 Develop information & education programs across region (e.g. Driver behaviour, safety)

Strategy 2 – Maintain and upgrade key roads to support freight and people movement

This strategy aims to improve the efficiency and safety of road based freight while minimising the impact to other road users. Road upgrades are expensive and it is therefore prudent to ensure that strategy elements are linked to established funding mechanisms wherever possible.

As outlined in this document, road vehicles remain the dominant mode of transport for freight and we must consider through traffic, inbound/outbound traffic and a particularly high volume of traffic that moves between points within the region. The latter is driven largely by the need to transfer produce between primary producers and distributors or processors and also the need to consolidate outbound loads to specific long-haul destinations.

It is also necessary to ensure that local roads are maintained to prevent failures and traffic disruption.

Specific elements of this strategy should include:

S2.1 Provide access for higher productivity vehicles to farms and businesses at a local road level to improve operational productivity

S2.2 Improve access to established industry clusters

S2.3 Improve connectivity of emerging local industries with road network

S2.4 Upgrade roads and associated infrastructure to allow the greater use of more efficient, higher productivity vehicle combinations

S2.5 Provide road linkage to intermodal hubs to further enhance the supply chain between regional export industries and the port

S2.6 Provide road improvements to support growth in passenger vehicle traffic in key locations

S2.7 Ensure roads are provided to appropriate standards for freight and passenger movement

The Regional Development Victoria (RDV) funding program supports infrastructure projects that improve the competitiveness of regional Victoria through economic development and the support of export market development. The project steering committee identified a number of key projects associated with the upgrade of roads within the region that are supported by RDV's Regional Infrastructure Development Fund.

Strategy element 2.1 is supported by Regional Infrastructure Development Fund 'Local Roads to Market' strategy, which aims to assist dairy farmers, grain producers and the fruit industry within the region.

The Victorian Government key strategies, Victoria Transport Plan, Freight Futures – Victorian Freight Network Strategy (2008), National Transport Links – Growing Victoria's Economy (2007), focus on improving the connectivity of road freight within Victoria to further drive economic reform. These strategies are supportive of strategy elements 2.2, 2.3 and 2.4 above.

Strategy element 2.5 is supported by the Regional Infrastructure Development Fund 'Intermodal Freight Infrastructure Program'.

Strategy 3 – Create road by-passes around major towns

The local and State Government planning authorities in northern Victoria are embarking on a comprehensive structure and development plan to guide development, and enhance and protect the region's natural environment. The growth of northern Victoria and inland freight make bypass construction a high and urgent national highway priority.

There are numerous community and industry benefits from developing bypasses around key urban centres in the region, in particular Shepparton, Nagambie and Echuca.

For industry, the development of a bypass would enhance the international competitiveness of primary industries and food processing companies through the facilitation of the movement of freight along the Melbourne to Brisbane corridor and through the Goulburn Valley region. The level of service of commercial traffic could improve along with freight capacity, efficiency and reliability.

For residents, bypasses would relieve congestion due to through traffic in urban areas (i.e. Shepparton and Nagambie), improving safety and increasing amenity of urban areas.

Tourist access to the Murray River destinations would benefit from reduced driving times. Tourism opportunities in Nagambie will be changed by the reduction in through traffic following completion of the bypass. While the trade from passing traffic will decrease, there will be more opportunities to develop tourism with Nagambie as a destination.

Specific elements of this strategy should include:

S3.1 Construct Nagambie By-pass

S3.2 Construct Shepparton By-pass

S3.3 Construct Strathmerton By-pass

Strategy 4 – Further develop road-based public transport

Demand is growing for travel between regional centres and Melbourne. With more than 70% of Victoria's economic activities, including many specialised services, concentrated within the metropolitan area, access to Melbourne is a major requirement for communities across provincial Victoria.

Upgraded road corridors are already stimulating growth across regional Victoria. Making maximum use of this core infrastructure is critical to maintaining future growth, as well as to improving access to jobs, services, suppliers and customers for people and businesses in regional areas.

Maintaining liveability and connected communities in regional Victoria requires residential and commercial development with good access to transport links and well integrated public transport.

Specific elements of this strategy should include:

S4.1 Develop community-based regional and urban bus routes

S4.2 Develop safe, affordable and accessible linkages between different modes of public transport

S4.3 Continue support for transport access programs such as Transport Connections and Community Transport

Strategy 5 – Improve access to key tourism and recreation areas

Tourism is an economic and employment growth sector for the region and is an important aspect of the social, economic and physical make up. The six councils within the region encourage the development of new tourist attractions and services throughout the whole region to complement the existing tourist enterprises and further the economic well-being of the community through the creation of employment opportunities and wealth.

Specific elements of this strategy should include:

S5.1 Work with tourism authorities and operators to improve access to new and existing tourist and recreation areas

S5.2 Develop tourist drives across the region with consistent signage

S5.3 Develop trails for active and passive recreational use

Strategy 6 – Develop and standardise the rail network

There are two key aspects to the development of the network – competition and network access. Both have relevance to gauge standardisation. This section will also refute the viewpoint that as long as the only purpose for rail freight is to transport export goods to the ports, then there is no reason to standardise the rail gauge.

At present there is only one provider of rail services on broad gauge and hence there is no competition. While few routes, if any, routes have sufficient volume to enable more than one viable service, the lack of competition does not even enable the opportunity for competition at the time of contract review. There are more operators with standard gauge equipment and it seems reasonable to assume that future growth and/or new entrants will be in standard gauge.

In addition, the issue of complexity must be considered. As long as there are two rail gauges there will be increased complexity of the infrastructure with unnecessary redundancy in some areas and reduced flexibility to deal with malfunctions, accidents or scheduled maintenance.

For all freight lines, gauge standardisation offers the potential for connectivity to the national rail network and hence shipment by rail to other metropolitan centres, ports or distribution points.

In the case of the Tocumwal to Seymour line, gauge standardisation is also relevant to the discussion of the alignment for the proposed Melbourne to Brisbane Inland Rail Corridor. If the corridor is aligned through the Goulburn Valley, this would have the additional beneficial effect of necessitating gauge standardisation. Routing the Melbourne to Brisbane inland rail corridor via the Goulburn Valley would provide superior opportunities than the Albury option to capture business from the northern Victoria Food Bowl region as well as the Murrumbidgee Irrigation Area in NSW. The corridor would provide a direct rail link to Brisbane and an improved rail link to Sydney (via transfer to trucks at Parkes), which would reduce the number of trucks travelling along the Hume Freeway (Sydney) and the Newell Highway (Brisbane) and could result in opening of new markets.

Dual gauge track would only be necessary if the branch line to Dookie was not standardised or if there were reasons to maintain the passenger service to Shepparton on broad gauge.

This strategy will require the lobbying of the State Government to upgrade the existing broad gauge from Seymour to Tocumwal to standard gauge or dual gauge track as well as extensive lobbying of state and Federal government authorities, the *ARTC and other rail companies regarding the

alignment of the Inland Rail Corridor. A whole-of-region approach incorporating industry, local government, community and state members is encouraged.

Specific elements of this strategy should include:

S6.1 Upgrade rail infrastructure to meet demands of freight movement

S6.2 Continue to promote gauge standardisation across the rail network

Strategy 7 – Develop rail freight infrastructure

The development of intermodal centres represents a major economic driver for the northern Victoria region. Efficient intermodal facilities will enable industry in the region to transfer goods to key market areas, including the export market, more cost effectively and competitively, providing the opportunity to expand their market base. The success of the intermodal facility needs to be underpinned by the development of supportive local infrastructure to allow movement of freight to and from the facility.

Intermodal terminals should be developed at the Goulburn Valley Freight and Logistics Centre (GVFLC) at Mooroopna and sustained at Boort and Tocumwal in keeping with the Victorian Portal Strategy.

The Regional Infrastructure Development Fund 'Intermodal Freight Infrastructure Program' provides funding to facilitate the development of intermodal hubs.

Specific elements of this strategy should include:

S7.1 Upgrade the rail line between Seymour and Tocumwal to increase the capacity and speed of trains to allow more efficient movement of freight

S7.2 Continue development of intermodal freight terminals

Strategy 8 - Improve frequency, speed and safety of passenger rail services

Improved transport links – such as the Regional Fast Rail Project – are important in stimulating growth in parts of regional Victoria. Better connections with major infrastructure investments, including improvements to railway stations and interchanges, will be vitally important in supporting economic development and maintaining liveability in Northern Victoria.

Specific elements of this strategy should include:

S8.1 Ensure all rail owners and leaseholders are working together to manage rail infrastructure

S8.2 Provision of higher frequency, fast passenger service on key routes

Strategy 9 – Further develop regional airports

The main airports in the Northern Victoria area are located at Mangalore, Kerang, Yarrawonga and Shepparton. There is potential for growth in tourism, pilot training, freight movement and possibly passenger services in the future but further feasibility studies are required to confirm both the optimal location and potential opportunities at these sites.

Specific elements of this strategy should include:

S9.1 Enhance aerodrome infrastructure to support strategies

S9.2 Improve links between aerodromes and roads (from a freight perspective)

SUMMARY SECTION 6

Section 6 identified the strategies developed by the management committee and stakeholders. Through the workshops with stakeholders, nine key strategies linked to the vision, values and objectives have been agreed for the Regional Transport Strategy. These strategies illustrate the key drivers of developing a safe, efficient and sustainable transport network for the region. Each of the strategies helps to achieve an overarching objective for the region.

The strategies identified in this report are as follows

Strategy 1 - Provide safety upgrades to transport networks

Strategy 2 - Maintain and upgrade key roads to support freight and passenger movement

Strategy 3 - Create road by-passes around major towns

Strategy 4 - Further develop road-based public transport

Strategy 5 - Improve access to key tourism and recreation areas

Strategy 6 - Develop and standardise the rail network

Strategy 7 - Develop rail freight infrastructure

Strategy 8 - Improve frequency, speed and safety of passenger rail services

Strategy 9 - Further develop regional airports

These strategies were used in the development of the Assessment Framework Tool to help prioritise projects identified by stakeholders to achieve the objectives of the region through a range of local, state and federal funding programs.

CONCLUSION - SECTION 6

A range of network improvements are driven by the nine strategies. Each is important and each is very expensive. This region is however the Food Bowl of Australia. It is undergoing billions of dollars worth of irrigation rejuvenation and will need to cope with a massive increase in transport demand. The projects listed in the next section are therefore essential for the economic prosperity of not only the region, but also the State of Victoria.

ACTIONS - SECTION 6

This section contains the nine strategies and strategy elements that will be carried forward into specific actions. In addition to those strategy-driven actions:

A6.1 As state and Federal government policies and programs evolve, ensure that the funding matrix (see Table 9.1) is updated.

7.0 Action Plan

The action plan translates general statements of direction from the strategies into specific statements of proposed action. The action plan identifies the key projects for each of the strategies identified.

Appendix C contains the specific projects identified by sub-strategy and Appendix D contains the same projects sorted by municipality.

7.1 Strategy Action Items

The following is a summary of action items arising from the development of this strategy. They are included at the end of each section and the numbering scheme relates to sections of this report (i.e. A3.1 is the first action arising from Section 3 of this report). These actions generally have more relevance to future development of this strategy than to specific transport strategies.

A1.1 **Develop strong links with federal and state funding bodies and introduce the Northern Victoria Regional Transport Strategy and list of actions.**

A1.2 **Regularly update the Northern Victoria Regional Transport Strategy on advice from federal and state funding bodies such that the strategy reflects the strategic intent of their programs and therefore our regional actions have the best ongoing ability to attract funding.**

A1.3 **Continue to engage with industry and transport operators and system users to update the priority actions from time to time.**

A1.4 **Work with industry and transport operators to understand the environmental and safety benefits of more efficient transport systems.**

A2.1 **Review the vision, values and objectives every three years.**

A.3.1 **Continue to monitor transport growth in all areas and check actual versus estimated trend into the future.**

A.3.2 **Monitor economic development, tourism and industry growth and plan for the impact of growth on the transport network and on transport services.**

A.3.3 **Influence regional and state strategic planning to recognise the growth of the region and the need for transport infrastructure to match the increasing transport demands.**

A4.1 **Continue to monitor the sustainability figures for each of the network's assets and work towards 100% renewal funding.**

A4.2 **Continue to improve the network data relating to freight movements.**

A4.3 **Undertake a full audit of regional safety issues and feed this information into the next review of the strategy.**

A4.4 **Develop next stage project scopes for each of the intermodal facilities identified in the strategy.**

A4.5 **Develop a lobbying strategy for increased service frequency and faster trains for passenger rail to Shepparton and Echuca.**

A4.6 **Develop a lobbying strategy for the Goulburn Valley Highway by-pass projects in conjunction with the Goulburn Valley Highway Action Group.**

A4.7 **Develop a strategy to promote timely construction of the second bridge at Echuca.**

A6.1 **As state and federal government policies and programs evolve, ensure that the funding matrix (see Table 9.1) is updated.**

7.2 Additional Transport Related Actions

During the course of stakeholder meetings, certain comments and suggestions were made which, while not resulting in specific strategies, are worthy of capturing in this document for future work.

Work with relevant agencies to review and define the network hierarchy.

Develop maintenance strategies by working with intra-regional councils, Vic Roads and Federal Government.

Produce Traffic Management and Integrated Transport Plans for each municipality's regional centre and ensure consistency between local strategies (including walking and cycling) and the wider transport strategies and regional priorities.

Strengthen land use planning controls as a means of influencing development.

- Appropriate zoning of industrial areas to ensure network access and a freight network that supports this;
- Buffers between residential and industrial areas;
- Region wide consistency in planning policy;
- Reviewing land uses along arterial routes.

Establish a Freight Quality Partnership working group that encourages an environmental, economic and efficient approach to the transportation of goods within the region.

The strategy focuses on solutions developed and led within the region encompassing the key stakeholders: local and state governments, Industry Associations, Vic Roads, Railway operators, the community and local business. The Freight Quality Partnership is supported by an action plan agreed to by all stakeholders which identifies key local projects, the lead agency, steering group representatives and agreed target dates. Freight Quality Partnerships are developed at a local/regional level with funding and resource contribution sourced by key stakeholders within the program utilising local, state and federal funding options.

8.0 Assessment

Limited resources require continuous assessment of the relative merits of potential endeavours. This strategy has identified nine major strategies, 32 sub-strategies and a much larger number of potential projects proposing specific actions.

It is important that Councils have mechanisms to assign their own priorities in order to best assign resources and seek external funding. For this purpose, an assessment framework has been developed by Maunsell as part of this strategy development process.

The framework has been utilised by Maunsell in a simplified form to assign an initial priority to each of the identified projects (as indicated in Appendices C and D) but this must be viewed only as a first cut. It should be the work of individual councils who best know their own projects to assign final priorities using either this assessment framework or other tools at their disposal.

This assessment framework is described briefly below.

8.1 Assessment Framework

An assessment framework has been developed by Maunsell to enable Councils to prioritise project proposals to achieve key strategic outcomes. This tool establishes assessment criteria, relative importance weightings for those criteria and facilitates the scoring of individual projects against the criteria. It then calculates a final relative score for each project.

8.1.1 Assessment Criteria

Assessment criteria are the measures against which the strategies will be tested to determine if they are likely to be effective in achieving the desired outcomes. In the simplified form used for the independent assessment of all projects by Maunsell, the following two groups of assessment criteria were utilised. Each group consists of between 1 and 10 individual questions/criteria:

- Regional Transport Strategy Objectives (as developed in Section 5);
- Government commitment to the project

8.1.2 Criteria Weighting

The current weighting used in the assessment framework does not prioritise one group of criteria over another (i.e. each group of criteria has a maximum score of 20 and hence the same overall weighting). However, if it is decided that the overall summary scores should place greater emphasis on a particular set of objectives, the weightings can be amended to reflect this.

Each criterion has the same weighting as any other criterion within the same group.

8.1.3 Scoring against Criteria

Each project is scored against each criterion on a scale of 0 to 3. The results are normalised so that each group of criteria has a maximum score of 20 and therefore the total maximum score is 100.

From a practical standpoint, a tool such as this cannot be expected to objectively rank projects to the level of precision implied by a score from 0 to 100. For this reason the numerical scores were translated into groups of high, medium and low priority.

9.0 Funding Sources

Although the sources of funding will vary over time and will be influenced by political program changes, it is worthwhile noting what is currently available and the likely avenue of application matched to the project.

Table 9.1 suggests the current most likely sources of funding for different categories of projects.

Table 9.1 Funding Matrix

Strategy	Strategy Description	Type	Category	Private Funding	Council Funding	State Funding	Federal Funding
S1	**Provide safety upgrades to transport networks**						
S1.1	Intersection improvements	Road	Arterial Routes			Vic Roads & NSW RTA (Murray Bridges)	Auslink
S1.2	Bridge widening / strengthening	Bridge	Local Routes	Developer contributions	Rates / Loans	Grants Commission	R2R/Auslink
S1.3	Overtaking opportunities	Road	Local access to point of use or distribution (e.g. factory, warehouse, silo) - last mile	Developer contributions	Rates / Loans		
S1.4	Rest areas	Road	Tourism Routes		Rates / Loans	Vic Roads	
S1.5	Upgrade unsealed roads	Road	Freight Handling Infrastructure	Freight Operators, Logistics Providers			
S1.6	Timely asset renewal	Road, Bridge and Rail	Passenger Services	Bus operators	Rates / Loans	V/Line	R2R
S1.7	Improve safety of rail/road crossings	Rail / Road					
S1.8	Develop information & education programs across region (e.g. Driver behaviour, safety)		Freight Services	Freight operators			
S2	**Maintain & upgrade key roads to support freight & passenger movement**						
S2.1	Provide access for higher productivity vehicles to farms and businesses at a local road level to improve operational productivity	Road	Local Routes	Dairy Industry		RDV	
S2.2	Improve access to established industry clusters	Road	Local Routes			RDV	
S2.3	Improve connectivity of emerging local industries with road network	Road	Local Routes			Grants Commission	
S2.4	Upgrade roads and associated infrastructure to allow the greater use of more efficient, higher productivity vehicle combinations	Road	Local Routes			RDV	Grants Commission

Strategy	Strategy Description	Type	Category	Private Funding	Council Funding	State Funding	Federal Funding
S2.5	Provide road linkage to intermodal hubs to further enhance the supply chain between regional export industries and the port	Road	Local Routes			RDV	Grants Commission
S2.6	Provide road improvements to support growth in passenger vehicle traffic in key locations	Road	Local Routes			RDV	Grants Commission
S2.7	Ensure roads are provided to appropriate standards for freight and passenger movement	Road	Local Routes			RDV	Grants Commission
S3	**Create road by-passes around major towns**						
S3.1	Construct Nagambie By-pass	Road	Interstate Routes			Vic Roads	Auslink
S3.2	Construct Shepparton By-pas	Road	Interstate Routes			Vic Roads	Auslink
S3.3	Construct Strathmerton By-pass	Road	Arterial Routes			Vic Roads	Auslink
S4	**Further develop road-based public transport**						
S4.1	Develop community-based regional and urban bus routes	Public Transport	Passenger Services				
S4.2	Develop safe, affordable and accessible linkages between different modes of public transport	Public Transport	Passenger Services			LAAP	
S5	**Improve access to key tourism and recreation areas**						
S5.1	Work with tourism authorities and operators to improve access to new and existing tourist and recreation areas	Road	Tourism Routes			RDV	
S5.2	Develop tourist drives across the region with consistent signage	Road	Tourism Routes			RDV	
S5.3	Develop trails for active and passive recreational use	Cycling	Tourism Routes			LAAP	

S6	**Develop and standardise the rail network**						
S6.1	Upgrade rail infrastructure to meet demands of freight movement	Rail					
S6.2	Continue to promote gauge standardisation across the rail network	Rail					
S7	**Develop rail freight infrastructure**						
S7.1	Upgrade the rail line between Seymour and Tocumwal to increase the capacity and speed of trains to allow more efficient movement of freight	Rail	Passenger Services			VicTrack	
S7.2	Continue development of intermodal freight terminals	Road / Rail	Freight Handling Infrastructure	Industry	Rates / Loans	RDV	Auslink
S8	**Improve frequency, speed and safety of passenger rail services**						
S8.1	Ensure all rail owners and leaseholders are working together to manage rail infrastructure	Rail	Passenger Services		Rates / Loans	VicTrack	
S8.2	Provision of higher frequency, fast passenger service on key routes						
S9	**Further develop regional airports**						
S9.1	Enhance aerodrome infrastructure to support strategies	Aviation	Aerodromes				
S9.2	Improve links between aerodromes and roads (from a freight perspective)	Road & Aviation	Aerodromes				

10.0 Monitoring

While this strategy has a 15-year outlook, it is not possible to predict economic, environmental or social changes over that timeframe. If the strategy is to be used consistently however, it is important that it be kept relevant and up-to-date. It is therefore intended that this strategy should be monitored and reviewed on a periodic basis.

It is proposed that the strategies and actions should be revisited annually by the Hume Regional Management Forum, participating municipalities, Department of Planning and Community Development, Department of Transport and VicRoads. This will allow for a progress check on actions which were proposed and allow for updating where actions have either been accomplished or have been rendered of less importance due to other circumstances.

It is further proposed that the strategy as a whole should be reviewed every three years by the Hume Regional Management Forum, participating municipalities, Department of Planning and Community Development, Department of Transport and VicRoads. While it is unlikely that there will be change to vision or values, it is possible that there might be changes to objectives and to strategies over that timeframe.

Appendix A Environmental Assessment

This appendix is included as background data which supports the development of various environmental aspects of the transport strategy. This section discusses the three salient environment factors of climate change, peak oil and the Emissions Trading Scheme and then examines the potential impact of each on the main economic drivers of transport as identified in this strategy.

Climate Change

Increases in temperature will be exacerbated by any future decreases in rainfall, causing reduced soil moisture and greater evaporative demand. Table A1 below illustrates increases in temperature and decreases in rainfall by 2020 in Victoria with higher levels of evaporation and a lower atmospheric moisture balance. A number of other climate related variables such as levels of solar radiation and fire danger also have the potential to negatively impact the Northern Victoria Food Bowl.

Table A1: Climate change summary in 2030 for North Central Victoria based on simulations by the CCAM (Mark2) climate model (CSIRO, 2007a)

Climate variable	CCAM (Mark2) 2030
Annual average temperature	Increase by 0.5-1.5°C relative to 1990
• Days over 30°C	Kerang = +20.46%; Rutherglen +27.89%
• Days over 35°C	Kerang = +39.78%; Rutherglen +59.54%
• Days over 40°C	Kerang = +63.97%; Rutherglen +163.33%
Annual average rainfall	Decrease by -5 to -10% relative to 1990
Potential evaporation	Increase relative to 1990
Atmospheric moisture balance	Decrease by -200 to -400mm relative to 1990
1-in-40 year extreme daily rainfall	DJF: +12%; MAM: -4%; JJA: +13%; SON: -5% relative to the average simulated for 1961-2000
Extreme daily wind speed	Decrease by 0-3% relative to 1990
Annual average solar radiation	Increase by 0-2%, with largest increase in north central Victoria relative to 1990
Fire danger**	Increase by 4-20% relative to 1990

*DJF = December, January, February; MAM = March, April, May; JJA = June, July, August; SON = September, October, November.

**Fire danger scenarios are for the number of very high and extreme FFDI days by the year 2020.

Peak Oil

Peak oil occurs when the maximum global petroleum production rate is reached, after which the rate of production enters its terminal decline. If measures are not taken to reduce global consumption before this peak is reached, the availability of conventional oil will drop and prices will rise, perhaps dramatically. Modern farming techniques and transport of agricultural products directly or indirectly depend on oil, meaning that the Northern Victoria Food Bowl is sensitive to any price increases.

Emissions Trading Scheme

An emissions trading scheme (ETS) is an administrative approach used to control the release of carbon dioxide (and sometimes other pollutants) into the atmosphere through the provision of economic incentives. Should a price on emitting carbon dioxide be introduced to Australia in the future, it would have a number of impacts on the cost of production and transport for businesses in the Northern Victoria Food Bowl.

Impacts on Economic Drivers

The summaries provided in Section 1 and other relevant research has informed the following impacts on economic drivers for each industry group in Northern Victoria. The impacts for each driver of climate change, peak oil and the introduction of an ETS are discussed in turn, followed by an overall impact score.

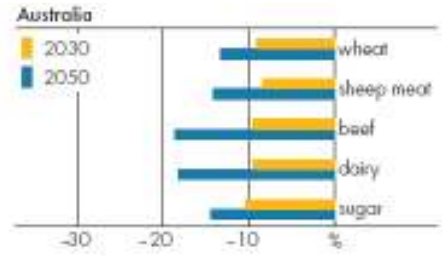
The scoring system used is as follows:

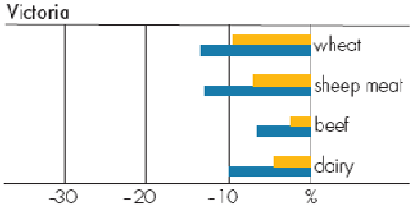
	Positive impact
	Minor or neutral impact
	Significant negative impact

Agriculture

ABARE (2007) recently published a report examining the impacts of climate change on agriculture. This utilises climate predictions based on CSIRO's (2007b) technical report, which estimates a one degree Celsius average increase in temperatures across Australia. Figure A1 indicates ABARE's projected reductions in agricultural production in Australia and Victoria, based on these climate predictions.

Figure A1: Agricultural production relative to the reference case (ABARE 2007)





The report also notes that with potential changes in climate, Australia's exports of key agricultural products are likely to decline by 2030: wheat by an estimated 11 per cent; beef by 29 per cent, sheep meat by 15 per cent; and dairy by 19 per cent respectively, relative to the reference case used.

The matrix below indicates key impacts of climate change, peak oil and the introduction of an ETS on the agricultural industry:

Climate Change	Peak Oil	ETS

These impacts are expected due to the following changes:

- Climate change will affect crops and livestock, depending on their tolerance to elevated maximum and minimum temperatures, moisture availability and tolerance of water stress, changes in exposure to pests, impacts of storms, and increased concentrations of carbon dioxide. Climate change could also have indirect social and economic effects, as regional and international markets respond to climate change. (State Government of Victoria 2008)
- Given that agriculture accounts for 17% of Australia's emissions (NGGI 2007), the introduction of an emissions trading scheme (ETS) incorporating the agricultural sector would lead to a significant increase in the cost of production.
- Increases in agricultural productivity experienced over the last century have been possible predominantly due to fertilisers, pesticides and mechanisation. These are all reliant on petrochemical derivatives, and consequently will be affected by peak oil.

Fruit Industry

The matrix below indicates key impacts of climate change, peak oil and the introduction of an ETS on the fruit industry:

Climate Change	Peak Oil	ETS

These impacts are expected due to the following changes:

- Warmer winters can reduce the yield of stone fruits that require winter chilling.
- Reduced water availability is likely to continue due to projected growth in demand and climate-driven changes in supply for irrigation, cities, industry and environmental flows. A decline in annual rainfall with higher evaporative demand would lead to a tendency for less run-off into rivers by 2030, i.e. a decline of 0-45% in 29 Victorian catchments.
- An escalating frequency of droughts will reduce soil moisture and make irrigation increasingly necessary – at a time when water resources are becoming less available.
- Fruit fly numbers could increase under warmer conditions (State Government of Victoria 2008)
- The fruit industry relies on a number of petrochemical inputs (fertiliser, pesticides and mechanisation) although it is probably less dependent on these than other agricultural sectors (e.g. wheat producers).
- Should carbon be priced in the future there would be a negative impact due to the petrochemical inputs noted above. There would be some scope for adaptation (e.g. shifting towards organic production techniques and focusing on local markets with less need for long distance transport).

Dairy Industry

The matrix below indicates key impacts of climate change, peak oil and the introduction of an ETS on the dairy industry:

Climate Change	Peak Oil	ETS

These impacts are expected due to the following changes:

- As illustrated in Figure A1, the Victorian dairy industry production levels will be negatively affected by future climate change.
- Although higher rainfall areas like East Gippsland may benefit from higher carbon dioxide concentrations, in Northern Victoria any fertilisation effect benefits are likely to be negated by higher temperatures and decreases in rainfall (limiting forage and animal production). Warmer temperatures also increase the risk of heat stress in cattle. (State Government of Victoria 2008)
- Peak oil would have a minor impact on operations at the dairy farm scale. However, repercussions (i.e. higher energy prices) would be felt further down the supply chain (see section on food processing) where energy is an important input for the production of products like cheese and yoghurt. Furthermore, the dairy industry is reliant on long distance transport as approximately half of all Australia's milk is exported (in the form of a variety of dairy products) (Dairy Australia 2008).
- A price for carbon would not impact operations at the dairy farm scale. However, there would be negative consequences further down the supply chain where energy is an important component (for the reasons discussed above). Dairy farmers themselves would be affected if greenhouse gases (as opposed to purely carbon) were included in an ETS. This is because cows and paddocks emit methane and nitrous oxide.

Wine Industry

The matrix below indicates key impacts of climate change, peak oil and the introduction of an ETS on the wine industry:

Climate Change	Peak Oil	ETS

These impacts are expected due to the following changes:

- Climate change is likely to affect Victoria's wine regions – including accelerated ripening, the need for increased irrigation, and potential opportunities for cultivating new grape varieties (State Government of Victoria 2008).
- Viticulture relies on a number of petrochemical inputs (fertiliser, pesticides and mechanisation), but like the fruit growing industry, is probably less dependent on these than other agricultural sectors. As a large proportion of Australian wine is exported, peak oil is most likely to impact transport costs.
- A price for carbon is unlikely to significantly impact the viticulture industry as wine production is not an excessively energy intensive process.

Livestock

The matrix below indicates key impacts of climate change, peak oil and the introduction of an ETS on the livestock industry:

Climate Change	Peak Oil	ETS

These impacts are expected due to the following changes:

- The impacts of climate change on livestock will be very much dependent on the environment in which the animals are reared. For intensively raised livestock, heat stress, reductions in feed availability (such as grain and pasture) and increased pests/disease are likely to be issues. For extensively raised livestock, reduced pasture quality and quantity, increased soil erosion and increased weed invasion will be key challenges.
- The rearing of livestock would not be directly impacted in any significant way by the advent of peak oil. However, there would be a number of indirect effects, such as increases in the price of feed (due to increased cost of producing and moving food for intensively reared animals) and the cost of other energy dependent processes such as storage and transportation of meat.
- A price for carbon would be more significant for operations that raise animals on grain as this is a more carbon intensive process than rearing on pasture. However, as noted above, cattle do produce large amounts methane which would be included if an ETS were to incorporate other greenhouse gas emissions other than just carbon.

Food Processing

The matrix below indicates key impacts of climate change, peak oil and the introduction of an ETS on the food processing industry:

Climate Change	Peak Oil	ETS

These impacts are expected due to the following changes:

- Goulbourn Valley's food processing industry utilises a variety of locally grown agricultural products. These companies may therefore face higher prices of raw materials (e.g. wheat or fruit) as changes in climate increase farmer's costs of production.
- Food processing is typically energy intensive and will therefore be negatively impacted if carbon becomes priced.
- The energy intensive nature of food processing means that it is vulnerable to fluctuations in the price of oil.

Manufacturing

The matrix below indicates key impacts of climate change, peak oil and the introduction of an ETS on the manufacturing industry:

Climate Change	Peak Oil	ETS

These impacts are expected due to the following changes:

- Manufacturing encompasses a broad range of industries and inputs, some of which are more vulnerable to climate change than others. For instance, an industry reliant on agricultural raw materials or water is more likely to suffer repercussions than one reliant on mined geological materials.
- Mining is typically energy intensive and will therefore be negatively impacted in the short term if carbon becomes priced.
- The energy intensive nature of mining and subsequent transport needs mean that it is vulnerable to increases in the price of oil.

Forestry

The matrix below indicates key impacts of climate change, peak oil and the introduction of an ETS on the forestry industry:

Climate Change	Peak Oil	ETS

These impacts are expected due to the following changes:

- In forestry, the CO2 benefits may be offset by decreased rainfall, increased bushfires and changes in pests.
- Peak oil is likely to have little impact on forestry yet may have some implications for energy intensive pulping/processing facilities.
- Pricing of carbon is likely to have a positive impact on the forestry industry – plantations and production native forests remove a millions of tonnes of carbon dioxide from the atmosphere each year.

Tourism

The matrix below indicates key impacts of climate change, peak oil and the introduction of an ETS on the tourism industry:

Climate Change	Peak Oil	ETS

These impacts are expected due to the following changes:

- Much of the tourism in the Goulburn Valley is based on the food and wine produced in the region. Although the productivity of (and perhaps the demand for) some of these agricultural products will be affected by climate change, it is unlikely to reduce the number of tourists wanting to visit.
- Peak oil is likely to impact the cost of travel and therefore may reduce the number of tourists visiting the area.
- Should carbon become priced it would negatively impact the tourism industry which is heavily reliant on travel.

Summary Matrix

The summary matrix below provides an overview of the selected environmental impacts to the economic drivers of the Northern Victoria Food Bowl.

Economic Drivers	Climate Impact	Peak Oil Impact	Price of Carbon Impact
Agriculture			
Fruit Industry			
Dairy Industry			
Wine Industry			
Livestock			
Food Processing			
Manufacturing			
Forestry			
Tourism			

Appendix B Project Pro-forma

Transport Infrastructure Project Suggestions

Proposing Council……

Project Title……

Location of Works……

Scope of Works……

……

……

Order of Magnitude Cost $……

What is the Strategic importance of this project?

……

……

……

Who are the key community and business stakeholders that will benefit from the works?

……

Does the project enhance the ability of regional industry and/or communities to compete in the national and global market-place? If so how?

……

……

Does the project perform a connecting function to a larger road network within the shire or through a neighbouring shire to a railhead, freight depot or higher order regional roads connecting to ports and airports? If so explain the link.

……

……

Does the project form part of an economic development strategy (consistent with existing or developing regional plans)? Identify the strategy and explain its context.

……

……

……

Does the project contribute to reduction in the environmental impact of passenger or freight transport?

……

……

……

Does the project enhance access for regionally significant production, resources, attractions or services?

……

……

Does the project enhance social equity by providing access for disadvantage demographic groups?

……

……

Completed by……

Contact telephone number……

Appendix C Action Plans - Projects sorted by Sub-Strategy

Strategy	Strategy Description	Locality (LGA)	Responsible Authority	Project Type	Project Location	Priority
S1	**Provide safety upgrades to transport networks**					
S1.1	Intersection improvements	Gannawarra	Gannawarra Shire Council, VicRoads	Upgrade for B-Doubles	Kerang – Airport Road (Airport Road Intersection)	Medium
S1.1	Intersection improvements	Gannawarra	Gannawarra Shire Council	Intersection Upgrade	Bowlands / Kow Swamp Rd Intersection	Medium
S1.1	Intersection improvements	Moira	Moira Shire Council, VicRoads	Intersection Upgrade	Gemmel Street, Campbell Road and Murray Valley Highway Intersection	Medium
S1.1	Intersection improvements	Moira	VicRoads	Intersection Upgrade	Construction of a Roundabout at the intersection of the Murray Valley Highway and Punt Road at Cobram	Medium
S1.1	Intersection improvements	Strathbogie	VicRoads, Strathbogie Shire Council	Interchange	Ballantynes Road - Goulburn Valley Freeway Interchange	Medium
S1.1	Intersection improvements	Loddon	VicRoads, Loddon Shire Council	Intersection Upgrade	Pyramid Yarraberb,Loddon Valley Highway	Medium
S1.1	Intersection improvements	Campaspe	VicRoads, Campaspe, GSCC	Freight	Freight route from Kyabram to Shepparton - upgrade intersections and road condition to improve conditions for heavy vehicles	Medium
S1.1	Intersection improvements	Campaspe	VicRoads, Campaspe Shire Council	Intersection Upgrade	Murray Valley Highway/Warren Street intersection north west of Echuca (Vicroads Suggestion)	Low
S1.1	Intersection improvements	Campaspe	VicRoads, Campaspe Shire Council	Intersection Upgrade	Murray Valley Highway/Sturt Street intersection east of Echuca (Vicroads Suggestion)	Low
S1.1	Intersection improvements	Campaspe	VicRoads, Campaspe Shire Council	Intersection Upgrade	Upgrade Bowen Street/Murray Valley Highway to accommodate B-double movements	Low
S1.1	Intersection improvements	Campaspe	VicRoads, Campaspe Shire Council	Intersection Upgrade	Echuca-Nanneella Rd & Kyabram-Echuca Rd intersection	Low
S1.1	Intersection improvements	Campaspe	VicRoads, Campaspe Shire Council	Intersection Upgrade	Echuca-Nanneella Rd & Kyabram-Rochester Rd intersection	Low
S1.1	Intersection improvements	Campaspe	Campaspe Shire Council	Intersection Upgrade	Hare Street & Heygarth Street	Low
S1.1	Intersection improvements	Campaspe	Campaspe Shire Council	Intersection Upgrade	Finlay Road & Trevaskis Road	Low

Strategy	Strategy Description	Locality (LGA)	Responsible Authority	Project Type	Project Location	Priority
S1.1	Intersection improvements	Campaspe	Campaspe Shire Council	Pedestrian safety	Upgrade of paths around Echuca Hospital for pedestrian amenity	Low
S1.1	Intersection improvements	Campaspe	Campaspe Shire Council	Pedestrian safety	Upgrade of Warren street for pedestrian access (esp. at bridge)	Low
S1.1	Intersection improvements	Campaspe	Campaspe Shire Council	Pedestrian safety	Upgrade of Allen St Kyabram for pedestrian access (esp. eastern end around school)	Low
S1.1	Intersection improvements	Campaspe	Campaspe Shire Council	Intersection Upgrade	Mackay & Elizabeth Streets outside Murray Goulburn factory	Low
S1.1	Intersection improvements	Campaspe	Campaspe Shire Council	Intersection Upgrade	Mundarra Road/Hovell Street intersection with Ogilvie Avenue	Low
S1.1	Intersection improvements	Campaspe	VicRoads, Campaspe Shire Council	Intersection Upgrade	DenmarkRd/Brown Rd/Maryann Rd intersection with Murray Valley Highway	Low
S1.2	Bridge widening / strengthening	Loddon	Loddon Shire Council	Widen/Seal/Bridge strengthening	Echuca Serpentine Road	Low
S1.2	Bridge widening / strengthening	Loddon	Loddon Shire Council	Widen/Seal/Bridge replacement	Bridgwater Raywood Road	Medium
S1.2	Bridge widening / strengthening	Moira	VicRoads, Moira Shire Council	Bridge	Yarrawonga Murray Valley Bridge	Low
S1.2	Bridge widening / strengthening	Strathbogie	Strathbogie Shire Council	Bridge strengthening	Mitchelltown Road Bridge	Low
S1.2	Bridge widening / strengthening	Campaspe	VicRoads, Campaspe Shire Council	Bridge	Rushworth - Tatura Road Bridge replacement over Waranga Channel north of Rushworth (Vicroads suggestion)	Medium
S1.2	Bridge widening / strengthening	Campaspe	VicRoads, Campaspe Shire Council	Bridge strengthening	Girgarre - Rushworth Road bridge over irrigation channel at 8.4km south of Girgarre (Vicroads suggestion)	Low
S1.2	Bridge widening / strengthening	Campaspe	VicRoads, Campaspe Shire Council	Bridge strengthening	Prairie-Rochester Road bridge over irrigation channel at 21km east of Tennyson (Vicroads suggestion)	Low
S1.2	Bridge widening / strengthening	Campaspe	VicRoads, Campaspe Shire Council	Bridge strengthening	Bendigo - Tennyson Road bridge over Piccaninny Creek at 29km (Vicroads suggestion)	Low
S1.2	Bridge widening / strengthening	Campaspe	VicRoads, Campaspe Shire Council	Bridge strengthening	Other bridge strengthening projects on arterial roads as determined by State wide priorities (Vicroads suggestion)	Low
S1.2	Bridge widening / strengthening	Campaspe	VicRoads, Campaspe Shire Council	Bridge widening	Murray Valley Highway – McCoy's Bridge over the Goulburn River at 195km needs to be widened (VicRoads suggestion)	Low
S1.2	Bridge widening / strengthening	Campaspe	Campaspe Shire Council	Safety	Investigation of standards of bridge guard rails & upgrades	Low

Strategy	Strategy Description	Locality (LGA)	Responsible Authority	Project Type	Project Location	Priority
S1.3	Overtaking opportunities	Loddon	Loddon Shire Council	Widen	Tandarra Serpentine Road	Low
S1.4	Rest stops	Campaspe	VicRoads, Campaspe Shire Council	Freight	Provide wayside truck stops for long distance operators	Medium
S1.4	Rest stops	Campaspe	VicRoads, Campaspe Shire Council	Freight	Truck/Trailer parking bay near Echuca	Low
S1.4	Rest stops	Loddon	VicRoads, Loddon Shire Council	Freight - provide truck parking	Bridgewater Serpentine or adjacent to Calder Highway - truck parking	Low
S1.5	Upgrade unsealed roads	Campaspe	Campaspe Shire Council	Seal	Quarry Road from end of existing seal to quarry	Low
S1.5	Upgrade unsealed roads	Loddon	Loddon Shire Council	Widen seal	Broughman St Sebastian Road	Medium
S1.5	Upgrade unsealed roads	Loddon	Loddon Shire Council	Seal	Silo Woolshed Road to grain bunkers - seal entrance	Low
S1.5	Upgrade unsealed roads	Strathbogie	Strathbogie Shire Council	Seal / New alignment	Kirwans Bridge Longwood Road	Low
S1.5	Upgrade unsealed roads	Strathbogie	Strathbogie Shire Council	General Road Safety Improvements	Euroa - Strathbogie Road Upgrade, widening sealing	Medium
S1.5	Upgrade unsealed roads	Strathbogie	Strathbogie Shire Council	General Road Safety Improvements	Upton Road, widening sealing	Low
S1.5	Upgrade unsealed roads	Strathbogie	Strathbogie Shire Council	Construct / Seal	Upton Road (Tarcombe to Longwood Ruffy Road)	Low
S1.5	Upgrade unsealed roads	Strathbogie	Strathbogie Shire Council	Construct	Gap Road Construction	Medium
S1.5	Upgrade unsealed roads	Strathbogie	Strathbogie Shire Council	Seal	Racecourse / McDonalds Road Construction	Low
S1.5	Upgrade unsealed roads	Campaspe	Campaspe Shire Council	Seal	Murphy Road missing link	Low
S1.6	Timely Asset Renewal	Campaspe	Campaspe Shire Council	Planning Study	Assess all local roads using an industry accepted model to identify a priority of safety remedial works in order e.g. NetRisk	Low
S1.6	Timely Asset Renewal	Gannawarra	Gannawarra Shire Council	Reconstruct/Re-sheet	Quambatook-Boort Road	Low
S1.6	Timely Asset Renewal	Loddon	Loddon Shire Council	Rehabilitate	Pyramid - Yarraberb Road Various sections	Medium
S1.7	Improve safety of rail/road crossings	Greater Shepparton	VicTrack, GSCC	Rail - Upgrade to active crossing	Lemnos North Road - Dookie Rail line	Low

Strategy	Strategy Description	Locality (LGA)	Responsible Authority	Project Type	Project Location	Priority
S1.7	Improve safety of rail/road crossings	Campaspe	VicTrack, Campaspe Shire Council	Rail	Echuca and Toolamba lines rail crossing safety upgrades (in accordance with ALCAM report)	Medium
S1.8	Develop information & education programs across region (e.g. Driver behaviour, safety)	Campaspe	Campaspe Shire Council	Education	Development of Driver Education Program for Personal Mobility Aid awareness	Low
S2	**Maintain and upgrade key roads to support freight and passenger movement**					
S2.1	Provide access for higher productivity vehicles to farms and businesses at a local road level to improve operational productivity	Moira	Moira Shire Council	Intersection, Widen, Seal, replacement	Dairy Roads Programme - Implementation of identified routes and treatment of routes/location within the Dairy Road Study	Medium
S2.1	Provide access for higher productivity vehicles to farms and businesses at a local road level to improve operational productivity	Campaspe	Campaspe Shire Council	Arterial Link	Strathallen Road link	Medium
S2.1	Provide access for higher productivity vehicles to farms and businesses at a local road level to improve operational productivity	Campaspe	Campaspe Shire Council	Planning Study	Undertake a study to develop an appropriate gravel road and sealed road network	Medium
S2.1	Provide access for higher productivity vehicles to farms and businesses at a local road level to improve operational productivity	Campaspe	Campaspe Shire Council	Upgrade	Echuca-Nanneella Road	Medium
S2.1	Provide access for higher productivity vehicles to farms and businesses at a local road level to improve operational productivity	Gannawarra	Gannawarra Shire Council	Reconstruct/Re-sheet	Lalbert-Kerang Road	Medium
S2.1	Provide access for higher productivity vehicles to farms and businesses at a local road level to improve operational productivity	Gannawarra	Gannawarra Shire Council	Reconstruct/Re-sheet	Quambatook-Swan Hill Road North	Medium
S2.1	Provide access for higher productivity vehicles to farms and businesses at a local road level to improve operational productivity	Gannawarra	Gannawarra Shire Council	Reconstruct/Re-sheet	Quambatook-Swan Hill Road South	Medium
S2.1	Provide access for higher productivity vehicles to farms and businesses at a local road level to improve operational productivity	Gannawarra	Gannawarra Shire Council	Upgrade for B-Doubles	Suttie Road	Medium
S2.1	Provide access for higher productivity vehicles to farms and businesses at a local road level to improve operational productivity	Gannawarra	Gannawarra Shire Council	Upgrading Council Truck Routes	Lake Charm – Quambatook Road	Low
S2.1	Provide access for higher productivity vehicles to farms and businesses at a local road level to improve operational productivity	Gannawarra	Gannawarra Shire Council	Upgrading Council Truck Routes	Kangaroo Lake Road	Low
S2.1	Provide access for higher productivity vehicles to farms and businesses at a local road level to improve operational productivity	Strathbogie	Strathbogie Shire Council	Upgrade for B-Doubles	Mitchelltown Road Bridge	Low

Strategy	Strategy Description	Locality (LGA)	Responsible Authority	Project Type	Project Location	Priority
S2.2	Improve access to established industry clusters	Moira	Moira Shire Council	Intersection, Widen, Seal, replacement	Freight to Market Programme - Study of agricultural and freight requirements from producer to market to ensure that linkages are identified, prioritised and constructed	High
S2.2	Improve access to established industry clusters	Campaspe	Campaspe Shire Council	Upgrades	Investigate sealing of roads to tomatoes/other soft fruit farming areas for quality of products	Low
S2.2	Improve access to established industry clusters	Campaspe	Campaspe Shire Council	Construct	Murray Valley Highway service road construction east of railway line, Echuca	Low
S2.2	Improve access to established industry clusters	Campaspe	Campaspe Shire Council	Construct	Murray Valley Highway service lane construction north of roundabout, Echuca	Low
S2.2	Improve access to established industry clusters	Campaspe	Campaspe Shire Council	Upgrade	Northern Highway service lane construction - both sides of Northern Highway between 118 Northern Highway to approx 1.3km north, Echuca	Low
S2.2	Improve access to established industry clusters	Greater Shepparton	GSCC	Intersection upgrade	Welsford Street Transport Link	Medium
S2.3	Improve connectivity of emerging local industries with road network	Moira	Moira Shire Council	Intersection, Widen, Seal, replacement	B Double HPV Programme – Completion of development of a study and routes for large vehicles to facilitate the transport of freight to major transport links	High
S2.3	Improve connectivity of emerging local industries with road network	Strathbogie	Strathbogie Shire Council	Widen	Northwood Road Upgrade	Low
S2.3	Improve connectivity of emerging local industries with road network	Campaspe	Campaspe Shire Council	Economic development	Support growth of viticulture industry development with appropriate transport infrastructure	Medium
S2.3	Improve connectivity of emerging local industries with road network	Campaspe	VicRoads, Campaspe Shire Council	works associated with 2nd bridge	Associated road works to second bridge	Low
S2.4	Upgrade roads and associated infrastructure to allow the greater use of more efficient, higher productivity vehicle combinations	Gannawarra	Gannawarra Shire Council	Upgrading road	Culgoa – Lalbert Road	Medium
S2.4	Upgrade roads and associated infrastructure to allow the greater use of more efficient, higher productivity vehicle combinations	Gannawarra	Gannawarra Shire Council	Upgrading road	Pyramid-Cohuna Road & Flannerys Road	Medium
S2.4	Upgrade roads and associated infrastructure to allow the greater use of more efficient, higher productivity vehicle combinations	Strathbogie	Strathbogie Shire Council	Widen	Nagambie Locksley Road Upgrade	Low
S2.4	Upgrade roads and associated infrastructure to allow the greater use of more efficient, higher productivity vehicle combinations	Loddon	Loddon Shire Council	Seal widening	Echuca Serpentine Road m- all narrow sections	Medium
S2.4	Upgrade roads and associated infrastructure to allow the greater use of more efficient, higher productivity vehicle combinations	Greater Shepparton, (& Benalla)	VicRoads	Upgrade	Freight route developments including Shepparton-Wodonga route	Medium
S2.4	Upgrade roads and associated infrastructure to allow the greater use of more efficient, higher productivity vehicle combinations	Greater Shepparton	VicRoads	Upgrade	Shepparton - Katamatite road improvements	Medium

Strategy	Strategy Description	Locality (LGA)	Responsible Authority	Project Type	Project Location	Priority
S2.4	Upgrade roads and associated infrastructure to allow the greater use of more efficient, higher productivity vehicle combinations	Campaspe	Campaspe Shire Council	Widen/Seal	McSwain Road seal widening - widen a narrow sealed road adjacent to new residential development	Medium
S2.4	Upgrade roads and associated infrastructure to allow the greater use of more efficient, higher productivity vehicle combinations	Campaspe	Campaspe Shire Council	Widen/Seal	Enhanced maintenance program on edge break repair to narrow sealed pavements, particularly on truck routes	Low
S2.4	Upgrade roads and associated infrastructure to allow the greater use of more efficient, higher productivity vehicle combinations	Campaspe	Campaspe Shire Council	Widen/Seal	Toolleen-Cornella Road widening	Low
S2.4	Upgrade roads and associated infrastructure to allow the greater use of more efficient, higher productivity vehicle combinations	Campaspe	Campaspe Shire Council	Upgrade	Study of capacity of existing truck route network for capacity to accommodate possible larger vehicles (eg. B-triples)	Low
S2.5	Provide road linkage to intermodal hubs to further enhance the supply chain between regional export industries and the port	Greater Shepparton	VicRoads, GSCC	Upgrade	Duplication of Midland Highway, West of Mooroopna	Medium
S2.5	Provide road linkage to intermodal hubs to further enhance the supply chain between regional export industries and the port	Greater Shepparton	GSCC	Arterial Link	East-West Arterial North Shepparton	High
S2.5	Provide road linkage to intermodal hubs to further enhance the supply chain between regional export industries and the port	Greater Shepparton	GSCC	Widen	Food Bowl Road Pavement Widening Program	High
S2.7	Ensure roads are provided to appropriate standards for freight and passenger movement	Greater Shepparton	VicRoads, GSCC	Upgrade	Duplication of Midland Highway Shepparton East with urgent emphasis west of Doyles Road.	High
S2.7	Ensure roads are provided to appropriate standards for freight and passenger movement	Greater Shepparton	VicRoads	Realignment	Midland Highway realignment Nalinga west of the intersection of Dookie – Nalinga Road	Low
S2.7	Ensure roads are provided to appropriate standards for freight and passenger movement	Campaspe	VicRoads, NSW RTA	Bridge	Second bridge crossing over the Murray at Echuca Moama	High
S2.7	Ensure roads are provided to appropriate standards for freight and passenger movement	Campaspe	VicRoads, Campaspe Shire Council	Upgrade	Murray Valley Highway duplication - Ogilvie Ave to approx. 1.5km north	Medium
S2.7	Ensure roads are provided to appropriate standards for freight and passenger movement	Campaspe	VicRoads, Campaspe Shire Council	Upgrade	Murray Valley Highway duplication between Sturt Street and Echuca-Kyabram Road, east of Echuca (VicRoads suggestion)	Low
S2.7	Ensure roads are provided to appropriate standards for freight and passenger movement	Campaspe	VicRoads, Campaspe Shire Council	Upgrade	Northern Highway section 2 duplication - south approach to Echuca (VicRoads suggestion)	Medium
S2.7	Ensure roads are provided to appropriate standards for freight and passenger movement	Greater Shepparton	VicRoads, GSCC	Upgrade	Upgrading of the Shepparton Alternative Route (C391)	High
S2.7	Ensure roads are provided to appropriate standards for freight and passenger movement	Loddon	Loddon Shire Council	Seal widening	Bridgewater Raywood Road	Low
S2.7	Ensure roads are provided to appropriate standards for freight and passenger movement	Loddon	Loddon Shire Council	Widen seal	Gladfield Rd - Quarry route	Medium

Strategy	Strategy Description	Locality (LGA)	Responsible Authority	Project Type	Project Location	Priority
S2.7	Ensure roads are provided to appropriate standards for freight and passenger movement	Campaspe, Moria	VicRoads	Upgrade	Upgrade Murray Valley Highway to A road standard	Medium
S2.7	Ensure roads are provided to appropriate standards for freight and passenger movement	Campaspe	Campaspe	Planning	Consolidate landscape master plans to create a more cohesive planning structure for roads	Low
S3	**Create road by-passes around major towns**					
S3.1	Construct Nagambie By-pass	Strathbogie	VicRoads	Bypass	Nagambie Bypass	High
S3.2	Construct Shepparton By-pass	Greater Shepparton	VicRoads	Bypass	Shepparton Bypass	High
S3.3	Construct Strathmerton By-pass	Moira	VicRoads	Bypass	Tocumwal Bend Bypass	Medium
S4	**Further develop road-based public transport**					
S4.1	Develop community based regional and urban bus routes	Campaspe	Campaspe Shire Council	Upgrade	Enhanced services between Echuca, Rochester, Kyabram, Rushworth	Low
S4.2	Develop safe, affordable and accessible linkages between different modes of public transport	Campaspe	Campaspe Shire Council	System upgrade	Provide access to public transport ticket sales locally in rural towns	Medium
S4.2	Develop safe, affordable and accessible linkages between different modes of public transport	Campaspe	Campaspe Shire Council	Personal Mobility Aids	Driver education on Personal Mobility Aids, as well as increasing public awareness & access	Low
S4.2	Develop safe, affordable and accessible linkages between different modes of public transport	Campaspe	Campaspe Shire Council	Personal Mobility Aids	Development of clubs & groups for Personal Mobility Aid drivers for greater involvement in community	Low
S5	**Improve access to key tourism and recreation areas**					
S5.1	Work with tourism authorities and operators to improve access to new and existing tourist and recreation areas	Moira	Moira Shire Council	Intersection, Widen, Seal, replacement	Tourist Links Programme – Study of tourism and visitor generated traffic to identify priority routes and provide for future growth	Medium
S5.1	Work with tourism authorities and operators to improve access to new and existing tourist and recreation areas	Campaspe	Campaspe Shire Council	Seal	Roslynmead Road (seal widening at north end), Fraser Road, O'Dwyer Road, Casey Road, Stewarts Bridge Road, Braun Road	Low
S5.1	Work with tourism authorities and operators to improve access to new and existing tourist and recreation areas	Campaspe	Campaspe Shire Council	Improvement of intersections & road linkages	Promote linkages between Echuca, Kyabram, Tongala, Rochester, Rushworth, Lockington and Gunbower - Include on a touring route from Echuca	Medium
S5.1	Work with tourism authorities and operators to improve access to new and existing tourist and recreation areas	Campaspe	Campaspe Shire Council	Improvement of intersections & road linkages	Rushworth - sealed tourist drives between Nagambie and Rushworth	Low
S5.1	Work with tourism authorities and operators to improve access to new and existing tourist and recreation areas	Campaspe	Campaspe Shire Council	Signage, education	Signs & education for greater awareness of locations of tourist destinations (boat ramps in particular)	Low
S5.1	Work with tourism authorities and operators to improve access to new and existing tourist and recreation areas	Campaspe	Campaspe Shire Council	Upgrade for tourism	Improve access to boat ramps	Low

Strategy	Strategy Description	Locality (LGA)	Responsible Authority	Project Type	Project Location	Priority
S5.1	Work with tourism authorities and operators to improve access to new and existing tourist and recreation areas	Campaspe	Campaspe Shire Council	Upgrade for tourism	Upgrade Torrumbarry Weir Road to weir and caravan park	Low
S5.3	Develop trails for active and passive recreational use	Greater Shepparton	GSCC	Bicycle	Murchison to Rushworth Rail Trail	Medium
S5.3	Develop trails for active and passive recreational use	Campaspe	Campaspe Shire Council	Shared Pathways	Rushworth shared pathway extension to west of existing path	Medium
S6	**Develop and standardise the rail network**					
S6.1	Upgrade rail infrastructure to meet demands of freight movement	Campaspe	VicTrack, Campaspe Shire Council	Rail	Provision of secure parking area for trains in Echuca to obviate the need to send trains back to Bendigo for secure parking	Medium
S7	**Develop rail freight infrastructure**					
S7.1	Upgrade the rail line between Seymour and Tocumwal to increase the capacity and speed of trains to allow more efficient movement of freight	Greater Shepparton	VicTrack / ARTC	Intermodal Freight	Upgrade the rail line between Seymour and Tocumwal	High
S7.2	Continue development of intermodal freight terminals	Greater Shepparton	GSCC	Intermodal Freight	Goulburn Valley Freight and Logistics Centre	High
S8	**Improve frequency, speed and safety of passenger rail services**					
S8.1	Ensure all rail owners and leaseholders are working together to manage rail infrastructure	Moira	Moira Shire Council	Passenger Rail	Feasibility study of reinstatement of passenger rail service to Cobram and Numurkah	Medium
S8.1	Ensure all rail owners and leaseholders are working together to manage rail infrastructure	Greater Shepparton	GSCC / VicTrack	Passenger Rail	Railway line relocation out of CBD	Medium
S8.2	Provision of higher frequency, fast passenger service on key routes	Regional	Councils, V-Line	Passenger Rail	Fast train options - RFR	High
S9	**Further develop regional airports**					
S9.1	Enhance aerodrome infrastructure to support strategies	Greater Shepparton	GSCC	Aerodrome	Relocation of Shepparton Aerodrome	Low
S9.1	Enhance aerodrome infrastructure to support strategies	Campaspe	Campaspe Shire Council	Tourism	Airport Enhancement	Low
S9.1	Enhance aerodrome infrastructure to support strategies	Campaspe	Campaspe Shire Council	Industry	Look at predicted future air movements (possibly freight) using Echuca Aerodrome, with possibility of including link to truck network, and distribution centre at airfield	Low
S9.1	Enhance aerodrome infrastructure to support strategies	Campaspe	Campaspe Shire Council	Emergency services link	Ensure airport is suitable for emergency services	Low
S9.1	Enhance aerodrome infrastructure to support strategies	Campaspe	Campaspe Shire Council	Planning	Develop and implement an Echuca Aerodrome master plan	Medium

Strategy	Strategy Description	Locality (LGA)	Responsible Authority	Project Type	Project Location	Priority
S9.1	Enhance aerodrome infrastructure to support strategies	Campaspe	Campaspe Shire Council	Planning	Development of Echuca South East Industrial and Commercial Growth Corridor Land Strategy including Echuca Aerodrome	Medium
S9.1	Enhance aerodrome infrastructure to support strategies	Campaspe	Campaspe Shire Council	Promotion	Echuca Airfield promotion	Low

Appendix D Action Plans

- Projects sorted by Municipality

CAMPASPE

Strategy	Strategy Description	Locality (LGA)	Responsible Authority	Project Type	Project Location	Priority
S1	**Provide safety upgrades to transport networks**					
S1.1	Intersection improvements	Campaspe	VicRoads, Campaspe, GSCC	Freight	Freight route from Kyabram to Shepparton - upgrade intersections and road condition to improve conditions for heavy vehicles	Medium
S1.1	Intersection improvements	Campaspe	VicRoads, Campaspe Shire Council	Intersection Upgrade	Murray Valley Highway/Warren Street intersection north west of Echuca (VicRoads Suggestion)	Low
S1.1	Intersection improvements	Campaspe	VicRoads, Campaspe Shire Council	Intersection Upgrade	Murray Valley Highway/Sturt Street intersection east of Echuca (VicRoads Suggestion)	Low
S1.1	Intersection improvements	Campaspe	VicRoads, Campaspe Shire Council	Intersection Upgrade	Upgrade Bowen Street/Murray Valley Highway to accommodate B-double movements	Low
S1.1	Intersection improvements	Campaspe	VicRoads, Campaspe Shire Council	Intersection Upgrade	Echuca-Nanneella Rd & Kyabram-Echuca Rd intersection	Low
S1.1	Intersection improvements	Campaspe	VicRoads, Campaspe Shire Council	Intersection Upgrade	Echuca-Nanneella Rd & Kyabram-Rochester Rd intersection	Low
S1.1	Intersection improvements	Campaspe	Campaspe Shire Council	Intersection Upgrade	Hare Street & Heygarth Street	Low
S1.1	Intersection improvements	Campaspe	Campaspe Shire Council	Intersection Upgrade	Finlay Road & Trevaskis Road	Low
S1.1	Intersection improvements	Campaspe	Campaspe Shire Council	Pedestrian safety	Upgrade of paths around Echuca Hospital for pedestrian amenity	Low
S1.1	Intersection improvements	Campaspe	Campaspe Shire Council	Pedestrian safety	Upgrade of Warren street for pedestrian access (esp. at bridge)	Low
S1.1	Intersection improvements	Campaspe	Campaspe Shire Council	Pedestrian safety	Upgrade of Allen St Kyabram for pedestrian access (esp. eastern end around school)	Low
S1.1	Intersection improvements	Campaspe	Campaspe Shire Council	Intersection Upgrade	Mackay & Elizabeth Streets outside Murray Goulburn factory	Low
S1.1	Intersection improvements	Campaspe	Campaspe Shire Council	Intersection Upgrade	Mundarra Road/Hovell Street intersection with Ogilvie Avenue	Low
S1.1	Intersection improvements	Campaspe	VicRoads, Campaspe Shire Council	Intersection Upgrade	DenmarkRd/Brown Rd/Maryann Rd intersection with Murray Valley Highway	Low
S1.2	Bridge widening / strengthening	Campaspe	VicRoads, Campaspe Shire Council	Bridge	Rushworth - Tatura Road Bridge replacement over Waranga Channel north of Rushworth (VicRoads suggestion)	Medium

Strategy	Strategy Description	Locality (LGA)	Responsible Authority	Project Type	Project Location	Priority
S1.2	Bridge widening / strengthening	Campaspe	VicRoads, Campaspe Shire Council	Bridge strengthening	Girgarre - Rushworth Road bridge over irrigation channel at 8.4km south of Girgarre (VicRoads suggestion)	Low
S1.2	Bridge widening / strengthening	Campaspe	VicRoads, Campaspe Shire Council	Bridge strengthening	Prairie-Rochester Road bridge over irrigation channel at 21km east of Tennyson (VicRoads suggestion)	Low
S1.2	Bridge widening / strengthening	Campaspe	VicRoads, Campaspe Shire Council	Bridge strengthening	Bendigo - Tennyson Road bridge over Piccaninny Creek at 29km (VicRoads suggestion)	Low
S1.2	Bridge widening / strengthening	Campaspe	VicRoads, Campaspe Shire Council	Bridge strengthening	Other bridge strengthening projects on arterial roads as determined by State wide priorities (VicRoads suggestion)	Low
S1.2	Bridge widening / strengthening	Campaspe	VicRoads, Campaspe Shire Council	Bridge widening	Murray Valley Highway – McCoy's Bridge over the Goulburn River at 195km needs to be widened (VicRoads suggestion)	Low
S1.2	Bridge widening / strengthening	Campaspe	Campaspe Shire Council	Safety	Investigation of standards of bridge guard rails & upgrades	Low
S1.4	Rest stops	Campaspe	VicRoads, Campaspe Shire Council	Freight	Provide wayside truck stops for long distance operators	Medium
S1.4	Rest stops	Campaspe	VicRoads, Campaspe Shire Council	Freight	Truck/Trailer parking bay near Echuca	Low
S1.5	Upgrade unsealed roads	Campaspe	Campaspe Shire Council	Seal	Quarry Road from end of existing seal to quarry	Low
S1.5	Upgrade unsealed roads	Campaspe	Campaspe Shire Council	Seal	Murphy Road missing link	Low
S1.6	Timely Asset Renewal	Campaspe	Campaspe Shire Council	Planning Study	Assess all local roads using an industry accepted model to identify a priority of safety remedial works in order e.g. NetRisk	Low
S1.7	Improve safety of rail/road crossings	Campaspe	VicTrack, Campaspe Shire Council	Rail	Echuca and Toolamba lines rail crossing safety upgrades (in accordance with ALCAM report)	Medium
S1.8	Develop information & education programs across region (e.g. Driver behaviour, safety)	Campaspe	Campaspe Shire Council	Education	Development of Driver Education Program for Personal Mobility Aid awareness	Low
S2	**Maintain and upgrade key roads to support freight and passenger movement**					
S2.1	Provide access for higher productivity vehicles to farms and businesses at a local road level to improve operational productivity	Campaspe	Campaspe Shire Council	Arterial Link	Strathallan Road link	Medium
S2.1	Provide access for higher productivity vehicles to farms and businesses at a local road level to improve operational productivity	Campaspe	Campaspe Shire Council	Planning Study	Undertake a study to develop an appropriate gravel road and sealed road network	Medium

Strategy	Strategy Description	Locality (LGA)	Responsible Authority	Project Type	Project Location	Priority
S2.1	Provide access for higher productivity vehicles to farms and businesses at a local road level to improve operational productivity	Campaspe	Campaspe Shire Council	Upgrade	Echuca-Nanneella Road	Medium
S2.2	Improve access to established industry clusters	Campaspe	Campaspe Shire Council	Upgrades	Investigate sealing of roads to tomatoes/other soft fruit farming areas for quality of products	Low
S2.2	Improve access to established industry clusters	Campaspe	Campaspe Shire Council	Construct	Murray Valley Highway service road construction east of railway line, Echuca	Low
S2.2	Improve access to established industry clusters	Campaspe	Campaspe Shire Council	Construct	Murray Valley Highway service lane construction north of roundabout, Echuca	Low
S2.2	Improve access to established industry clusters	Campaspe	Campaspe Shire Council	Upgrade	Northern Highway service lane construction - both sides of Northern Highway between 118 Northern Highway to approx 1.3km north, Echuca	Low
S2.3	Improve connectivity of emerging local industries with road network	Campaspe	Campaspe Shire Council	Economic development	Support growth of viticulture industry development with appropriate transport infrastructure	Medium
S2.3	Improve connectivity of emerging local industries with road network	Campaspe	VicRoads, Campaspe Shire Council	works associated with 2nd bridge	Associated road works to second bridge	Low
S2.4	Upgrade roads and associated infrastructure to allow the greater use of more efficient, higher productivity vehicle combinations	Campaspe	Campaspe Shire Council	Widen/Seal	McSwain Road seal widening - widen a narrow sealed road adjacent to new residential development	Medium
S2.4	Upgrade roads and associated infrastructure to allow the greater use of more efficient, higher productivity vehicle combinations	Campaspe	Campaspe Shire Council	Widen/Seal	Enhanced maintenance program on edge break repair to narrow sealed pavements, particularly on truck routes	Low
S2.4	Upgrade roads and associated infrastructure to allow the greater use of more efficient, higher productivity vehicle combinations	Campaspe	Campaspe Shire Council	Widen/Seal	Toolleen-Cornella Road widening	Low
S2.4	Upgrade roads and associated infrastructure to allow the greater use of more efficient, higher productivity vehicle combinations	Campaspe	Campaspe Shire Council	Upgrade	Study of capacity of existing truck route network for capacity to accommodate possible larger vehicles (eg. B-triples)	Low
S2.7	Ensure roads are provided to appropriate standards for freight and passenger movement	Campaspe	VicRoads, NSW RTA	Bridge	Second bridge crossing over the Murray at Echuca Moama	High
S2.7	Ensure roads are provided to appropriate standards for freight and passenger movement	Campaspe	VicRoads, Campaspe Shire Council	Upgrade	Murray Valley Highway duplication - Ogilvie Ave to approx. 1.5km north	Medium
S2.7	Ensure roads are provided to appropriate standards for freight and passenger movement	Campaspe	VicRoads, Campaspe Shire Council	Upgrade	Murray Valley Highway duplication between Sturt Street and Echuca-Kyabram Road, east of Echuca (VicRoads suggestion)	Low
S2.7	Ensure roads are provided to appropriate standards for freight and passenger movement	Campaspe	VicRoads, Campaspe Shire Council	Upgrade	Northern Highway section 2 duplication - south approach to Echuca (VicRoads suggestion)	Medium
S2.7	Ensure roads are provided to appropriate standards for freight and passenger movement	Campaspe, Moria	VicRoads	Upgrade	Upgrade Murray Valley Highway to A road standard	Medium

Strategy	Strategy Description	Locality (LGA)	Responsible Authority	Project Type	Project Location	Priority
S2.7	Ensure roads are provided to appropriate standards for freight and passenger movement	Campaspe	Campaspe	Planning	Consolidate landscape master plans to create a more cohesive planning structure for roads	Low
S4	**Further develop road-based public transport**					
S4.1	Develop community based regional and urban bus routes	Campaspe	Campaspe Shire Council	Upgrade	Enhanced services between Echuca, Rochester, Kyabram, Rushworth	Low
S4.2	Develop safe, affordable and accessible linkages between different modes of public transport	Campaspe	Campaspe Shire Council	System upgrade	Provide access to public transport ticket sales locally in rural towns	Medium
S4.2	Develop safe, affordable and accessible linkages between different modes of public transport	Campaspe	Campaspe Shire Council	Personal Mobility Aids	Driver education on Personal Mobility Aids, as well as increasing public awareness & access	Low
S4.2	Develop safe, affordable and accessible linkages between different modes of public transport	Campaspe	Campaspe Shire Council	Personal Mobility Aids	Development of clubs & groups for Personal Mobility Aid drivers for greater involvement in community	Low
S5	**Improve access to key tourism and recreation areas**					
S5.1	Work with tourism authorities and operators to improve access to new and existing tourist and recreation areas	Campaspe	Campaspe Shire Council	Seal	Roslynmead Road (seal widening at north end), Fraser Road, O'Dwyer Road, Casey Road, Stewarts Bridge Road, Braun Road	Low
S5.1	Work with tourism authorities and operators to improve access to new and existing tourist and recreation areas	Campaspe	Campaspe Shire Council	Improvement of intersections & road linkages	Promote linkages between Echuca, Kyabram, Tongala, Rochester, Rushworth, Lockington and Gunbower - Include on a touring route from Echuca	Medium
S5.1	Work with tourism authorities and operators to improve access to new and existing tourist and recreation areas	Campaspe	Campaspe Shire Council	Improvement of intersections & road linkages	Rushworth - sealed tourist drives between Nagambie and Rushworth	Low
S5.1	Work with tourism authorities and operators to improve access to new and existing tourist and recreation areas	Campaspe	Campaspe Shire Council	Signage, education	Signs & education for greater awareness of locations of tourist destinations (boat ramps in particular)	Low
S5.1	Work with tourism authorities and operators to improve access to new and existing tourist and recreation areas	Campaspe	Campaspe Shire Council	Upgrade for tourism	Improve access to boat ramps	Low
S5.1	Work with tourism authorities and operators to improve access to new and existing tourist and recreation areas	Campaspe	Campaspe Shire Council	Upgrade for tourism	Upgrade Torrumbarry Weir Road to weir and caravan park	Low
S5.3	Develop trails for active and passive recreational use	Campaspe	Campaspe Shire Council	Shared Pathways	Rushworth shared pathway extension to west of existing path	Medium
S6	**Develop and standardise the rail network**					
S6.1	Upgrade rail infrastructure to meet demands of freight movement	Campaspe	VicTrack, Campaspe Shire Council	Rail	Provision of secure parking area for trains in Echuca to obviate the need to send trains back to Bendigo for secure parking	Medium
S8	**Improve frequency, speed and safety of passenger rail services**					

Strategy	Strategy Description	Locality (LGA)	Responsible Authority	Project Type	Project Location	Priority
S8.2	Provision of higher frequency, fast passenger service on key routes	Regional	Councils, V-Line	Passenger Rail	Fast train options - RFR	High
S9	**Further develop regional airports**					
S9.1	Enhance aerodrome infrastructure to support strategies	Campaspe	Campaspe Shire Council	Tourism	Airport Enhancement	Low
S9.1	Enhance aerodrome infrastructure to support strategies	Campaspe	Campaspe Shire Council	Industry	Look at predicted future air movements (possibly freight) using Echuca Aerodrome, with possibility of including link to truck network, and distribution centre at airfield	Low
S9.1	Enhance aerodrome infrastructure to support strategies	Campaspe	Campaspe Shire Council	Emergency services link	Ensure airport is suitable for emergency services	Low
S9.1	Enhance aerodrome infrastructure to support strategies	Campaspe	Campaspe Shire Council	Planning	Develop and implement an Echuca Aerodrome master plan	Medium
S9.1	Enhance aerodrome infrastructure to support strategies	Campaspe	Campaspe Shire Council	Planning	Development of Echuca South East Industrial and Commercial Growth Corridor Land Strategy including Echuca Aerodrome	Medium
S9.1	Enhance aerodrome infrastructure to support strategies	Campaspe	Campaspe Shire Council	Promotion	Echuca Airfield promotion	Low

GANNAWARRA

Strategy	Strategy Description	Locality (Shire)	Responsible Authority	Project Type	Project Location	Priority
S1	**Provide safety upgrades to transport networks**					
S1.1	Intersection improvements	Gannawarra	Gannawarra Shire Council, VicRoads	Upgrade for B-Doubles	Kerang – Airport Road (Airport Road Intersection)	Medium
S1.1	Intersection improvements	Gannawarra	Gannawarra Shire Council	Intersection Upgrade	Bowlands / Kow Swamp Rd Intersection	Medium
S1.6	Timely Asset Renewal	Gannawarra	Gannawarra Shire Council	Reconstruct/Re-sheet	Quambatook-Boort Road	Low
S2	**Maintain and upgrade key roads to support freight and passenger movement**					
S2.1	Provide access for higher productivity vehicles to farms and businesses at a local road level to improve operational productivity	Gannawarra	Gannawarra Shire Council	Reconstruct/Re-sheet	Lalbert-Kerang Road	Medium
S2.1	Provide access for higher productivity vehicles to farms and businesses at a local road level to improve operational productivity	Gannawarra	Gannawarra Shire Council	Reconstruct/Re-sheet	Quambatook-Swan Hill Road North	Medium
S2.1	Provide access for higher productivity vehicles to farms and businesses at a local road level to improve operational productivity	Gannawarra	Gannawarra Shire Council	Reconstruct/Re-sheet	Quambatook-Swan Hill Road South	Medium
S2.1	Provide access for higher productivity vehicles to farms and businesses at a local road level to improve operational productivity	Gannawarra	Gannawarra Shire Council	Upgrade for B-Doubles	Suttie Road	Medium
S2.1	Provide access for higher productivity vehicles to farms and businesses at a local road level to improve operational productivity	Gannawarra	Gannawarra Shire Council	Upgrading Council Truck Routes	Lake Charm – Quambatook Road	Low
S2.1	Provide access for higher productivity vehicles to farms and businesses at a local road level to improve operational productivity	Gannawarra	Gannawarra Shire Council	Upgrading Council Truck Routes	Kangaroo Lake Road	Low
S2.4	Upgrade roads and associated infrastructure to allow the greater use of more efficient, higher productivity vehicle combinations	Gannawarra	Gannawarra Shire Council	Upgrading road	Culgoa – Lalbert Road	Medium
S2.4	Upgrade roads and associated infrastructure to allow the greater use of more efficient, higher productivity vehicle combinations	Gannawarra	Gannawarra Shire Council	Upgrading road	Pyramid-Cohuna Road & Flannerys Road	Medium
S8	**Improve frequency, speed and safety of passenger rail services**					
S8.2	Provision of higher frequency, fast passenger service on key routes	Regional	Councils, V-Line	Passenger Rail	Fast train options - RFR	High

LODDON

Strategy	Strategy Description	Locality (Shire)	Responsible Authority	Project Type	Project Location	Priority
S1	**Provide safety upgrades to transport networks**					
S1.1	Intersection improvements	Loddon	VicRoads, Loddon Shire Council	Intersection Upgrade	Pyramid Yarraberb,Loddon Valley Highway	Medium
S1.2	Bridge widening / strengthening	Loddon	Loddon Shire Council	Widen/Seal/Bridge strengthening	Echuca Serpentine Road	Low
S1.2	Bridge widening / strengthening	Loddon	Loddon Shire Council	Widen/Seal/Bridge replacement	Bridgwater Raywood Road	Medium
S1.3	Overtaking opportunities	Loddon	Loddon Shire Council	Widen	Tandarra Serpentine Road	Low
S1.4	Rest stops	Loddon	VicRoads, Loddon Shire Council	Freight - provide truck parking	Bridgewater Serpentine or adjacent to Calder Highway - truck parking	Low
S1.5	Upgrade unsealed roads	Loddon	Loddon Shire Council	Widen seal	Broughman St Sebastian Road	Medium
S1.5	Upgrade unsealed roads	Loddon	Loddon Shire Council	Seal	Silo Woolshed Road to grain bunkers - seal entrance	Low
S1.6	Timely Asset Renewal	Loddon	Loddon Shire Council	Rehabilitate	Pyramid - Yarraberb Road Various sections	Medium
S2	**Maintain and upgrade key roads to support freight and passenger movement**					
S2.4	Upgrade roads and associated infrastructure to allow the greater use of more efficient, higher productivity vehicle combinations	Loddon	Loddon Shire Council	Seal widening	Echuca Serpentine Road m- all narrow sections	Medium
S2.7	Ensure roads are provided to appropriate standards for freight and passenger movement	Loddon	Loddon Shire Council	Seal widening	Bridgewater Raywood Road	Low
S2.7	Ensure roads are provided to appropriate standards for freight and passenger movement	Loddon	Loddon Shire Council	Widen seal	Gladfield Rd - Quarry route	Medium
S8	**Improve frequency, speed and safety of passenger rail services**					
S8.2	Provision of higher frequency, fast passenger service on key routes	Regional	Councils, V-Line	Passenger Rail	Fast train options - RFR	High

MOIRA

Strategy	Strategy Description	Locality (Shire)	Responsible Authority	Project Type	Project Location	Priority
S1	**Provide safety upgrades to transport networks**					
S1.1	Intersection improvements	Moira	Moira Shire Council, VicRoads	Intersection Upgrade	Gemmel Street, Campbell Road and Murray Valley Highway Intersection	Medium
S1.1	Intersection improvements	Moira	VicRoads	Intersection Upgrade	Construction of a Roundabout at the intersection of the Murray Valley Highway and Punt Road at Cobram	Medium
S1.2	Bridge widening / strengthening	Moira	VicRoads, Moira Shire Council	Bridge	Yarrawonga Murray Valley Bridge	Low
S2	**Maintain and upgrade key roads to support freight and passenger movement**					
S2.1	Provide access for higher productivity vehicles to farms and businesses at a local road level to improve operational productivity	Moira	Moira Shire Council	Intersection, Widen, Seal, replacement	Dairy Roads Programme - Implementation of identified routes and treatment of routes/location within the Dairy Road Study	Medium
S2.2	Improve access to established industry clusters	Moira	Moira Shire Council	Intersection, Widen, Seal, replacement	Freight to Market Programme - Study of agricultural and freight requirements from producer to market to ensure that linkages are identified, prioritised and constructed	High
S2.3	Improve connectivity of emerging local industries with road network	Moira	Moira Shire Council	Intersection, Widen, Seal, replacement	B Double HPV Programme – Completion of development of a study and routes for large vehicles to facilitate the transport of freight to major transport links	High
S2.7	Ensure roads are provided to appropriate standards for freight and passenger movement	Campaspe, Moira	VicRoads	Upgrade	Upgrade Murray Valley Highway to A road standard	Medium
S3	**Create road by-passes around major towns**					
S3.3	Construct Strathmerton By-pass	Moira	VicRoads	Bypass	Tocumwal Bend Bypass	Medium
S5	**Improve access to key tourism and recreation areas**					
S5.1	Work with tourism authorities and operators to improve access to new and existing tourist and recreation areas	Moira	Moira Shire Council	Intersection, Widen, Seal, replacement	Tourist Links Programme – Study of tourism and visitor generated traffic to identify priority routes and provide for future growth	Medium
S8	**Improve frequency, speed and safety of passenger rail services**					
S8.1	Ensure all rail owners and leaseholders are working together to manage rail infrastructure	Moira	Moira Shire Council	Passenger Rail	Feasibility study of reinstatement of passenger rail service to Cobram and Numurkah	Medium
S8.2	Provision of higher frequency, fast passenger service on key routes	Regional	Councils, V-Line	Passenger Rail	Fast train options - RFR	High

GREATER SHEPPARTON

Strategy	Strategy Description	Locality (Shire)	Responsible Authority	Project Type	Project Location	Priority
S1	**Provide safety upgrades to transport networks**					
S1.7	Improve safety of rail/road crossings	Greater Shepparton	VicTrack, GSCC	Rail - Upgrade to active crossing	Lemnos North Road - Dookie Rail line	Low
S2	**Maintain and upgrade key roads to support freight and passenger movement**					
S2.2	Improve access to established industry clusters	Greater Shepparton	GSCC	Intersection upgrade	Welsford Street Transport Link	Medium
S2.4	Upgrade roads and associated infrastructure to allow the greater use of more efficient, higher productivity vehicle combinations	Greater Shepparton, (& Benalla)	VicRoads	Upgrade	Freight route developments including Shepparton-Wodonga route	Medium
S2.4	Upgrade roads and associated infrastructure to allow the greater use of more efficient, higher productivity vehicle combinations	Greater Shepparton	VicRoads	Upgrade	Shepparton - Katamatite road improvements	Medium
S2.5	Provide road linkage to intermodal hubs to further enhance the supply chain between regional export industries and the port	Greater Shepparton	VicRoads, GSCC	Upgrade	Duplication of Midland Highway West Mooroopna	Medium
S2.5	Provide road linkage to intermodal hubs to further enhance the supply chain between regional export industries and the port	Greater Shepparton	GSCC	Arterial Link	East-West Arterial North Shepparton	High
S2.5	Provide road linkage to intermodal hubs to further enhance the supply chain between regional export industries and the port	Greater Shepparton	GSCC	Widen	Food Bowl Road Pavement Widening Program	High
S2.7	Ensure roads are provided to appropriate standards for freight and passenger movement	Greater Shepparton	VicRoads, GSCC	Upgrade	Duplication of Midland Highway Shepparton East with urgent focus west of Doyles Road	High
S2.7	Ensure roads are provided to appropriate standards for freight and passenger movement	Greater Shepparton	VicRoads	Realignment	Midland Highway realignment Nalinga west of the intersection of Dookie – Nalinga Road	Low
S2.7	Ensure roads are provided to appropriate standards for freight and passenger movement	Greater Shepparton	VicRoads, GSCC	Upgrade	Upgrading of the Shepparton Alternative Route (C391)	High
S3	**Create road by-passes around major towns**					
S3.2	Construct Shepparton By-pass	Greater Shepparton	VicRoads	Bypass	Shepparton Bypass	High
S5	**Improve access to key tourism and recreation areas**					
S5.3	Develop trails for active and passive recreational use	Greater Shepparton	GSCC	Bicycle	Murchison to Rushworth Rail Trail	Medium
S7	**Develop rail freight infrastructure**					

Strategy	Strategy Description	Locality (Shire)	Responsible Authority	Project Type	Project Location	Priority
S7.1	Upgrade the rail line between Seymour and Tocumwal to increase the capacity and speed of trains to allow more efficient movement of freight	Greater Shepparton	VicTrack / ARTC	Intermodal Freight	Upgrade the rail line between Seymour and Tocumwal	High
S7.2	Continue development of intermodal freight terminals	Greater Shepparton	GSCC	Intermodal Freight	Goulburn Valley Freight and Logistics Centre	High
S8	**Improve frequency, speed and safety of passenger rail services**					
S8.1	Ensure all rail owners and leaseholders are working together to manage rail infrastructure	Greater Shepparton	GSCC / VicTrack	Passenger Rail	Railway line relocation out of CBD	Medium
S8.2	Provision of higher frequency, fast passenger service on key routes	Regional	Councils, V-Line	Passenger Rail	Fast train options - RFR	High
S9	**Further develop regional airports**					
S9.1	Enhance aerodrome infrastructure to support strategies	Greater Shepparton	GSCC	Aerodrome	Relocation of Shepparton Aerodrome	Low

STRATHBOGIE

Strategy	Strategy Description	Locality (Shire)	Responsible Authority	Project Type	Project Location	Priority
S1	**Provide safety upgrades to transport networks**					
S1.1	Intersection improvements	Strathbogie	VicRoads, Strathbogie Shire Council	Interchange	Ballantynes Road - Goulburn Valley Freeway Interchange	Medium
S1.2	Bridge widening / strengthening	Strathbogie	Strathbogie Shire Council	Bridge strengthening	Mitchelltown Road Bridge	Low
S1.5	Upgrade unsealed roads	Strathbogie	Strathbogie Shire Council	Seal / New alignment	Kirwans Bridge Longwood Road	Low
S1.5	Upgrade unsealed roads	Strathbogie	Strathbogie Shire Council	General Road Safety Improvements	Euroa - Strathbogie Road Upgrade, widening sealing	Medium
S1.5	Upgrade unsealed roads	Strathbogie	Strathbogie Shire Council	General Road Safety Improvements	Upton Road, widening sealing	Low
S1.5	Upgrade unsealed roads	Strathbogie	Strathbogie Shire Council	Construct / Seal	Upton Road (Tarcombe to Longwood Ruffy Road)	Low
S1.5	Upgrade unsealed roads	Strathbogie	Strathbogie Shire Council	Construct	Gap Road Construction	Medium
S1.5	Upgrade unsealed roads	Strathbogie	Strathbogie Shire Council	Seal	Racecourse / McDonalds Road Construction	Low
S2	**Maintain and upgrade key roads to support freight and passenger movement**					
S2.1	Provide access for higher productivity vehicles to farms and businesses at a local road level to improve operational productivity	Strathbogie	Strathbogie Shire Council	Upgrade for B-Doubles	Mitchelltown Road Bridge	Low
S2.3	Improve connectivity of emerging local industries with road network	Strathbogie	Strathbogie Shire Council	Widen	Northwood Road Upgrade	Low
S2.4	Upgrade roads and associated infrastructure to allow the greater use of more efficient, higher productivity vehicle combinations	Strathbogie	Strathbogie Shire Council	Widen	Nagambie Locksley Road Upgrade	Low
S3	**Create road by-passes around major towns**					
S3.1	Construct Nagambie By-pass	Strathbogie	VicRoads	Bypass	Nagambie Bypass	High
S8	**Improve frequency, speed and safety of passenger rail services**					
S8.2	Provision of higher frequency, fast passenger service on key routes	Regional	Councils, V-Line	Passenger Rail	Fast train options - RFR	High