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Building our National Transport Future

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State Government Victoria Department of Infrastructure

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Melbourne–Mildura Corridor Strategy

Building our National Transport Future

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FOREWORD

AUSLINK IS A MAJOR AUSTRALIAN GOVERNMENT INITIATIVE DESIGNED TO ACHIEVE BETTER NATIONAL LAND TRANSPORT PLANNING, FUNDING AND INVESTMENT DECISION MAKING.

One of the key components of the AusLink process is the development of a strategy for each corridor of the AusLink National Network. A Corridor Strategy is a statement of the shared strategic priorities of the Australian and State/Territory Governments for the long-term (20-25 year) development of the corridor. Corridor strategies provide guidance to decision-makers and project proponents formulating network initiatives, and most importantly, inform development of the next and subsequent National Land Transport Plans.

Consistent with the spirit of AusLink, the Melbourne–Mildura Corridor Strategy is a collaborative initiative that is jointly owned by the Australian Government Department of Transport and Regional Services (DOTARS), the Victorian Department of Infrastructure (DOI) and VicRoads. The strategy was prepared by a project team comprising representatives from these agencies and builds on planning work undertaken by the Victorian Government.

MELBOURNE–MILDURA CORRIDOR STRATEGY – AT A GLANCE

The regions surrounding the Melbourne–Mildura Corridor generate nationally significant levels of exports of agricultural produce such as grain, fruits, nuts and livestock. The Mildura region at the northern end of the corridor is home to a large irrigated horticulture industry which produces a large proportion of Australia's wine grape crush, table grapes, citrus fruits, dried vine fruit, almonds and pistachio nuts. A substantial proportion of the agricultural and processed food products of the Mildura region are transported along the corridor to the markets in Melbourne and for export.

Dry land farming involving livestock and grain dominates the middle sections of the corridor in the Mallee and Wimmera regions. Wheat is the largest agricultural product by volume with an average 765,000 tonnes being produced each year. Pastoral agriculture is common at the southern end of the corridor.

The Murray River Basin, comprising largely sandy soils, supports a significant and expanding mineral mining industry specialising in bentonite, gypsum, salts, zircon, titanium ores and rare earth metals.

Freight traffic generally originates in the northern and middle sections of the corridor and moves southwards for export or domestic distribution and consumption. Ninety five per cent of the wheat crop is transported by rail and rail is also important in the movement of the other grains produced in the Mallee and Wimmera, including barley, oats and canola. Around 12 per cent of all agricultural products from the Mildura region are moved by rail.

The service and manufacturing industries in the region provide support to communities and to the agricultural and mining sectors. The main commercial and population centres along the corridor are Mildura, Bendigo, Castlemaine, Sunbury, Maryborough, Ballarat and Geelong. Bendigo and Ballarat are among the largest regional towns in Victoria and are important commercial hubs with large food processing, manufacturing, tourism, educational, health and financial sectors. Mildura is a vital food producing, transport, retail, commercial and tourist hub at the northern end of the corridor.

The Murray River hinterland, various national parks and historic sites in Bendigo and Ballarat are popular tourist attractions and generate a substantial number of passenger trips along the corridor each year, mainly originating from Melbourne. The Macedon Ranges and the Spa Region around Daylesford also attract significant number of visitors.

The overall performance of the Calder Highway is satisfactory with good width, pavement surface, shoulders and bridges to carry large freight vehicles effectively. The Calder Highway experiences heavy traffic conditions in the Melbourne metropolitan area and its outskirts, is duplicated for much of the distance to Bendigo and flows satisfactorily. Once north of the Bendigo area, traffic on the Calder (which is unduplicated for much of the Bendigo–Mildura section) is typically light until the intensive agricultural and semi-urban area near Mildura is reached. Travel times on the Calder are generally reliable with occasional disruptions caused by bad weather, crashes and other incidents. The Sunraysia Highway runs parallel to the Calder Highway and plays an important part in freight and passenger movements in the Mallee and Wimmera dry land farming region. Numerous secondary roads play subsidiary roles in carrying freight to silos and other handling facilities, and retail supplies to towns in the Mallee and Wimmera. There is pressure on these roads to carry a mix of large freight trucks and cars safely without a deterioration of road surfaces and shoulders.

The Gheringhap–Mildura broad gauge rail track which is used for freight rail services, is deteriorating and requires significant work to address current speed restrictions and low axle mass limits that limit capacity and efficiency. Insufficient and short passing loops also limit the capacity of the track. Despite the deficiencies affecting the rail track, it provides significant benefit to the region through freight competition and lessening of road maintenance work, road crash risk and greenhouse gas emissions.

The Mildura, Mallee and Wimmera regions are expected to continue as important sources of agricultural exports in the future. Crops and farming practices are likely to adjust to the expected lower average rainfall and more extreme weather conditions resulting from climate change. The populations in the cities of Ballarat, Bendigo and Mildura are expected to increase by around 35 to 40 per cent by 2031, reinforcing their role as key commercial and service providers. The mining of mineral sands in the Murray Basin region has significant potential for growth as global demand for resources increases.

Economic and population growth along the corridor is expected to drive transport growth along the Calder Highway with light vehicles dominating the number of vehicle kilometres travelled. Road traffic will continue to be concentrated in the Mildura, Bendigo and outer metropolitan Melbourne regions. According to

BTRE forecasts, road traffic is forecast to increase by around 55 per cent over the next 20 years between Melbourne and Bendigo and by around 35 per cent north of Bendigo. The role of rail for the transport of freight and bulk agricultural goods southward has the potential to grow, particularly if the planned upgrade of tracks between Gheringhap and Mildura proceeds.

The five strategic priorities for the Melbourne–Mildura Corridor are:

- improving capacity and efficiency of the rail track;
- providing sufficient road capacity to deal efficiently with a growing freight and passenger task along the Calder Highway and on connecting roads;
- maximising safety of road based passenger and freight movements;
- ensuring continued access to the Melbourne–Mildura road and rail corridor from key state and local roads; and
- managing road traffic issues (safety, amenity, capacity) at towns along the corridor.

The short-term priorities for the period to 2015, and key challenges for the corridor are summarised in Table 1 on the next page.

TABLE 1 Summary of Key Challenges and Short-Term Priorities

Key Challenges	Short-Term Priorities
Providing sufficient road capacity in the northern section (Mildura and its hinterland) to deal with a fast-growing regional economy and population growth and the impact of east-west movements on the Sturt Highway. In the southern section of the corridor, ensuring that the condition and capacity of the Calder Highway and inter-urban and commuter public transport, remain good and sufficient to deal with expected increases in commuter, tourist and freight traffic as satellite towns to Melbourne's north and west grow and major regional centres such as Ballarat, Bendigo and Castlemaine, together with smaller towns, experience more tourist traffic. These factors will also contribute to a need for the roads providing access from the Calder Highway to regional towns not on the Calder to be in good condition. Improving the reliability, performance and safety of the rail corridor through appropriate capacity increases to help carry the growing freight task from the Mildura district and the other regions along the corridor. Dealing with the mix of freight and passenger vehicles especially on two lane sections of the Calder Highway and other roads in the corridor so that safety outcomes improve. Providing safe access to and from local roads and properties abutting the corridor. Enhancing safety at level crossings appropriate to projections of road and rail traffic. Responding to fatigue related safety concerns. Improving the condition of the Melbourne–Mildura rail link and throughput of silos and terminals to reduce transit times and improve reliability. Ensuring road pavements and surfaces are in good condition. Improving the safety and condition of roads that link with the Calder and Sunraysia Highways. Dealing with capacity concerns that give rise to travel speed and safety issues. Dealing with safety, amenity and capacity issues at towns and cities along the route in particular on Bendigo's main arterial roads due to growth areas and rising traffic. Planning long-term strategic land use to ensure that land reservations exist for future links.	Upgrade rail track condition, alignment and number and length of passing loops to improve rail reliability, efficiency and productivity. Improve safety of at-grade road/rail crossings. Manage fatigue related safety issues, such as improving the number and facilities of rest areas on the Calder and other highways. Improve safety and capacity of two lane sections of road including overtaking lanes and duplication (particularly north of Bendigo). Address safety concerns associated with vertical alignment and sight distance along the undulating section of Calder Highway between Red Cliffs and Ouyen by providing more passing opportunities. Manage mixed traffic conditions and general traffic growth at higher trafficked points. Manage local access intersections and improvement of access roads, particularly in the highly trafficked areas. Continue duplication of the highway between Red Cliffs and the Sturt Highway (near Mildura) as safety considerations, traffic volumes and economic benefits warrant. Maintenance and rehabilitation of bridges on the Calder and other highways. Maintenance and rehabilitation of ageing road sections, including improvement to shoulder seals, widths and pavements. Manage road traffic issues (safety, amenity, capacity) at towns along the corridor. Provide additional capacity and improve safety by providing freeway interchanges and access restoration and additional lanes where traffic volumes are high. Improve access management on the duplicated and unduplicated sections of the corridor to improve road safety, efficiency of traffic flow and ensure that the duplicated sections of the road operate at full freeway standard. Reserve land for future road and rail links, town bypasses, re-alignment and duplication where appropriate.

CONTENTS

Chapter 1

STRATEGIC CONTEXT

AUSLINK

AusLink is a major Australian Government initiative designed to achieve better national land transport planning, funding and investment decision making. The AusLink National Network and its connections to the broader transport network are the passenger and freight backbone of Australia's national land transport system and are the focus of the Australian Government's planning and funding responsibility. The smooth and efficient operation of this network is a crucial element in achieving integration of all transport modes and supporting economic development.

AUSLINK NETWORK OBJECTIVES

The Melbourne–Mildura Corridor Strategy is based on the AusLink Network objectives. The AusLink Network will support national economic growth by developing sustainable transport solutions that:

- increase its infrastructure handling capacity and efficiency;
- improve its safety and security;
- improve transport productivity on its nationally strategic and export-oriented freight corridors;
- improve the reliability of travel on interstate and inter-regional corridors; and
- are consistent with viable, long-term economic and social outcomes, and with the obligation to current and future generations to sustain the environment.

These objectives guide the activities of the Australian Government and the States and Territories working collaboratively to develop corridor strategies and plan further development of the AusLink Network.

AUSLINK CORRIDOR STRATEGIES

A key component of the AusLink process is the development of a strategy for each corridor of the AusLink National Network. These corridor strategies take a broad multi-modal systems view of the operation of the transport corridor, look at both freight and passenger movement and actively consider innovative approaches and alternatives to build infrastructure solutions.

This corridor strategy is a statement of the shared objectives and strategic priorities of the Australian and State/Territory Governments for the long-term (20-25 year) development of the Melbourne–Mildura Corridor. It diagnoses the current and future condition and adequacy of the transport links that make up the corridor and establishes strategic priorities.

PROCESS AND METHODOLOGY

The Melbourne–Mildura Corridor Strategy has been prepared jointly by a project team of representatives from the Australian Government Department of Transport and Regional Services, the Victorian Department of Infrastructure and VicRoads. The project team received guidance from a steering group of senior officers. The strategy was prepared through a process of research and analysis, to which consultants contributed. The preparation of the strategy also benefited from extensive consultation with stakeholders.

The strategy document takes into account relevant Australian and State Government policy settings, strategies and objectives, including the AusLink White Paper and the recently announced major transport statement released by the Victorian Government, *Meeting Our Transport Challenges* (MOTC). MOTC seeks to deliver a quality transport system to accommodate anticipated population growth in Victoria over the next 25 years without impeding economic growth. The statement is consistent with the essential AusLink Network objectives described above and the AusLink focus of facilitating freight movements.

A draft strategy was posted for public comment on the AusLink website for a four week period during April and May in 2007. Written submissions were received from various stakeholders and these views have been considered by the project team in the finalisation of this strategy document.

Several other AusLink Corridors involve transport links that affect movements within and along the Melbourne–Mildura Corridor. For example, the Sydney–Adelaide Corridor incorporates truck movements along the Sturt Highway which impact on traffic flows in the Mildura district. The Melbourne–Adelaide Corridor involves road and rail links that pass through regions of western Victoria that are adjacent to the regions served by Melbourne–Mildura Corridor. The performance of transport links on the Melbourne–Mildura Corridor is partly affected by the efficiency of road and rail movements in the Melbourne metropolitan area. Thus, the deficiencies, challenges and priorities identified in the Melbourne–Mildura Strategy should not be considered in isolation from those arising from the Sydney–Adelaide, Melbourne–Adelaide, Melbourne–Geelong and Melbourne Urban Corridor Strategies.

Chapter 2

THE CURRENT SITUATION – CORRIDOR PROFILE

DESCRIPTION OF THE CORRIDOR

The Melbourne–Mildura Corridor is officially defined in the AusLink (National Land Transport) Act National Land Transport Network Determination 2005 as:

- the Calder Freeway and Highway, from the junction of the Calder Freeway and the Western Ring Road, to its intersection with the Sturt Highway at Mildura; and
- the broad gauge railway from Gheringhap Junction (Victoria), through Ballarat, Maryborough, St Arnaud, Ouyen and Mildura, to the end of the line at Yelta (Victoria).

The entire length of the corridor is around 550 kilometres. At the northern end of the corridor, the Sturt Highway provides a major east-west link connecting Sydney to Adelaide and is part of the AusLink National Network. At the southern end of the corridor, the Western Ring Road links the Western Freeway, Princes Freeway and Hume Freeway which are all part of the declared AusLink Network.

The Sunraysia Highway is not on the declared AusLink Network, but is an important road link in the region which runs parallel to the Calder Highway and provides connection between important towns and agricultural regions and also serves as an alternative north-south link.

Although not on the declared AusLink Network, there are several rail lines that run parallel to the broad gauge railway defined in the corridor. These 'parallel' lines include the standard gauge lines which start in Yapeet and Hopetoun and are used mainly to carry grain to ports. The parallel lines also include three broad gauge lines, emanating from Kulwin, Robinvale and Piangil/Swan Hill in the northern Mallee, that lie to the east of the Mildura/Yelta–Gheringhap line and which mainly carry grain to points further south. The Swan Hill line also carries passengers to and from Melbourne, with a V/Line bus service connecting Mildura with the Swan Hill railway station.

The Melbourne–Mildura Corridor and connections to other major links are shown in Figure 1.

ROLE AND FUNCTION OF THE CORRIDOR

The Melbourne–Mildura Corridor has several roles:

- it supports the agriculture, mining, processing and manufacturing industries in the corridor in terms of access to markets and supply of inputs;
- it provides the vital link between rural towns and communities and to the major centres of Melbourne, Bendigo and Ballarat; and
- it is a major tourism route.

Agriculture

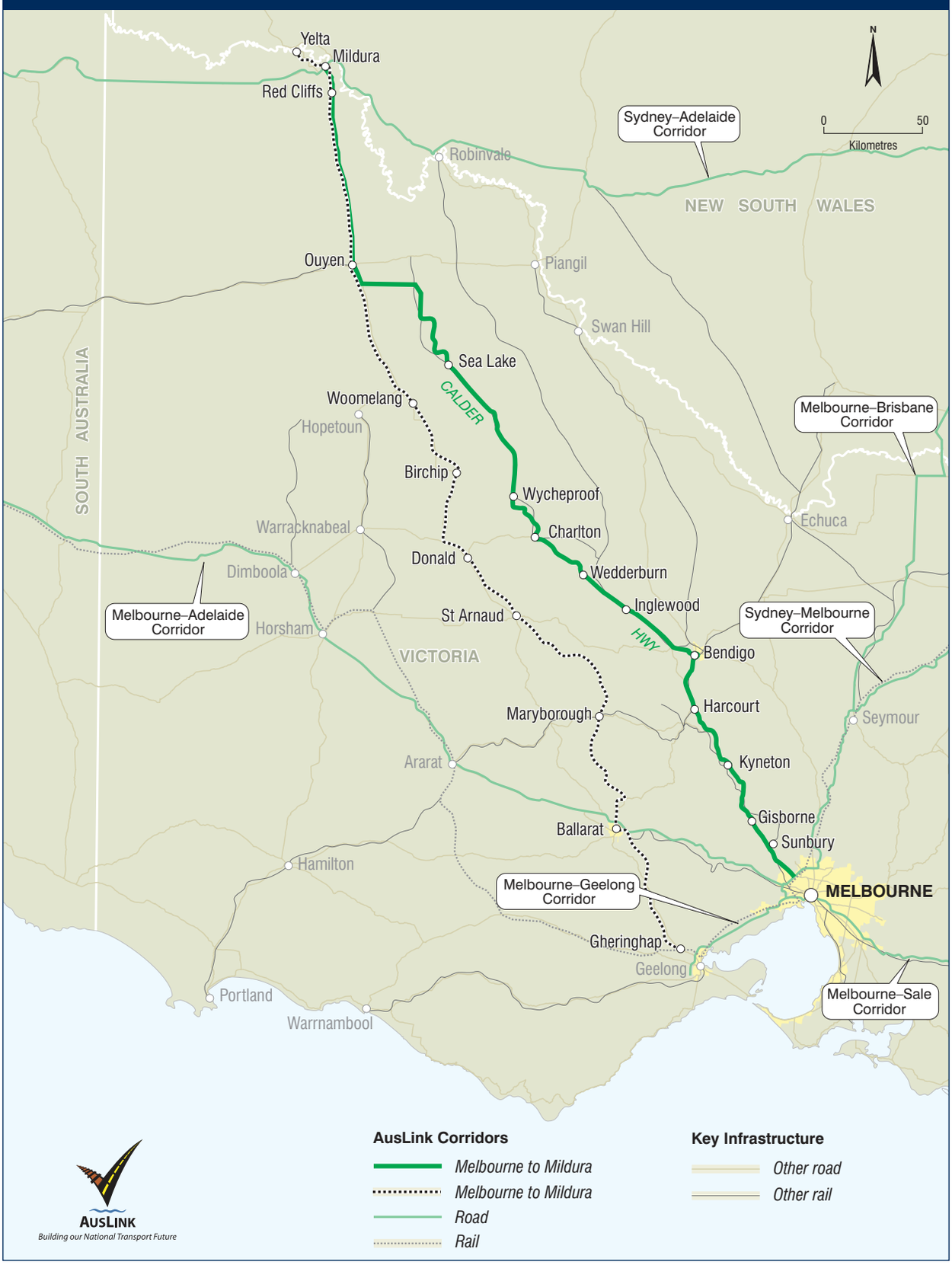
The Mildura region is a nationally significant centre for irrigated horticulture and agriculture and is also a major region for dryland agriculture[1]:

- the largest agricultural product by volume is wheat with 765,000 average yearly tonnes being carried. Barley and canola are also grown. Ninety five per cent of the wheat crop is transported by rail as are 12 per cent of all agricultural products from the region;
- grapes are the highest value agricultural product from the region with $333 million earned from a 400,000 tonne grape crush in 2003-04. Most of the grape crop is processed in the region for wine but Mildura is also a major source of table grapes. The region produces 21 per cent of Australia's wine grape crush and 69 per cent of the nation's table grapes;
- the region is also a major producer of a variety of other fruit, vegetables and nuts. The Mildura region produces 21 per cent of Australia's citrus fruits; 95 per cent of dried vine fruit; 55 per cent of almonds; and 41 per cent of pistachio nuts. Important vegetable crops are carrots, melons and asparagus and a number of smaller niche agricultural ventures (including honey production, mushrooms, olives, aquaculture and walnuts) are being developed. A substantial proportion of production is exported; and
- sheep, beef and dairy are the predominant livestock industries and the region also supplies about one-third of Victoria's pork production. Bendigo and Ouyen are major livestock selling centres in the region. There are smaller saleyards at other towns, including Wycheproof, Yelta and Mildura. Abattoirs are located at Mildura, Robinvale, Swan Hill, Wycheproof, Castlemaine and Kyneton.

The volume of agricultural produce transported along the corridor varies with the seasons. This is particularly true for grain which is mostly carried during the period between November and March each

[1] Melbourne–Mildura Corridor Foundation Study: Inter-regional Freight Demand Sd&D (2007)

FIGURE 1 Melbourne–Mildura Corridor



year. Large storage silos can be used to stagger the movement of grain to some extent. The peak season for the transport of grapes and wine is November to February. Other crops that are grown year-round, such as carrots, are not bound by the same degree of seasonal variability. Dryland agriculture is also sensitive to seasonal climatic variations. The size of the wheat crop can vary greatly between years in response to variable rainfall.

Minerals

Mining presents a major opportunity for future economic development in the region[2]:

- large reserves of mineral sands have been identified in the Murray Basin. The main minerals sought in sand mining are zircon, titanium ores and rare earth metals. Titanium is used to manufacture titanium dioxide, a white pigment used in the manufacture of paints, plastics, rubber and paper. There are around 75 million tonnes of proven deposits of mineral sands in the region and many other deposits throughout the Murray Basin are currently being defined by drilling;
- the region contains the largest bentonite deposit in Australia with indicated reserves exceeding 70 million tonnes. These deposits are largely undeveloped at present;
- salts are produced at three locations in the region and the facility at Mourquong is capable of producing 30,000-50,000 tonnes of sodium chloride a year. Magnesium chloride and magnesium sulphate are also produced. Salts are used for a range of products including supplies for the chemical industry, for fertiliser and animal supplements, for skin care products and gourmet culinary products. The Mourquong site also provides an important environmental benefit by stopping 200 tonnes of salt a day from entering the Murray River;
- gypsum is mined in the south-west of the region and distributed to dryland farms as a fertiliser. Over 400,000 cubic metres of gypsum are quarried in the Mallee region each year. It is understood that most of this tonnage is transported by road. Gypsum for agricultural use is road freighted into the area, often as backloads following deliveries of grain and other products to receiving points. Gypsum is also used in the manufacture of cement; and
- other mining activities include quarrying of road base material and gold mining in and around Bendigo and Ballarat.

Processing and Manufacturing

The corridor is also a major centre for food processing for export and local consumption and for manufacturing. The region has:

- over 34 wineries and over half of these are exporting their products;
- the largest independent processor of citrus juice in Australia, with capacity to process over 150,000 tonnes of fruit a year, and to manufacture over 200 different products using oranges, grapefruit, lemon, grapes, mandarins, carrots, apples and plums;
- the largest vegetable concentrate manufacturer in Australia, producing up to 30,000 tonnes of carrots yearly, 85 per cent of which is exported to Japan;
- large plants for the production and distribution of bulk feed in Bendigo and St Arnaud; and
- a large number of packing and processing facilities serving the food and wine industry.

Manufacturing and food processing is the largest contributor to the regional economy in Bendigo and generates an estimated $1.9 billion a year[3]. Of this total, $845 million in goods are exported. Manufacturing and food processing activities contribute significantly to freight movements along the Calder Highway between Bendigo and Melbourne. The five main manufacturing sectors represented in the city are food and beverages, metals and engineering, manufactured building products, textiles and clothing and transport related products. Ballarat is also significant in various food processing and manufacturing industries.

Tourism and Other Economic Activity

The Murray River hinterland, various national parks, and historic sites in Bendigo and Ballarat are popular tourist attractions and generate a substantial number of passenger trips along the corridor each year, mainly originating from Melbourne.

Tourism data are collected for the Mallee region as a whole. Domestic overnight visitors are currently above 700,000 a year and international overnight visitors around 120,000. There are a number of nearby

[2] Sd&D (2007)
[3] City of Greater Bendigo (2006)

national parks that are used for tourism and camping.

Bendigo, in the Goldfields Region, is a tourist drawcard known for its well preserved Goldrush era architecture, Chinese museum and heritage tram network. Mildura, Bendigo and Ballarat and other major towns on the corridor are important service centres for surrounding regions, providing retail, financial, education and health facilities. Closer to Melbourne, the spa country around Daylesford and the wineries throughout the Macedon Ranges also attract significant visitor numbers.

Linking Communities

The corridor provides a vital route for access to essential services, business and social connections, and the supply of general consumer goods to cities and rural communities along its length. Bendigo, for example, provides substantial education, training, health and retail services. Petrol and cement are the major inward bound freight items, but overall trade is dominated by outward movements. Other important products that are transported north, mainly by trucks, include processed foodstuffs, other groceries and retail goods for the cities and towns along and adjacent to the corridor.

At the southern end, the corridor also plays an increasing role as a commuter route connecting areas such as Sunbury, Gisborne and Kyneton to Melbourne by road and rail.

Current Pattern of Transport Activity

Freight Task

The freight task along the Melbourne–Mildura Corridor is substantial:

- BTRE figures suggest that the yearly freight task is around 750,000 tonne kilometres;
- the Mildura region in the far north of the corridor produces large quantities of fruit, vegetables, grapes and nuts, and much of this output (in fresh and processed forms) is transported to southern Victoria markets for domestic consumption and exporting. The dry farming regions of the Mallee and Wimmera produce substantial amounts of grains in years in which there is adequate rain, most of which is transported to southern ports (principally Geelong) for export and to domestic markets for processing;
- Bendigo's manufacturing sector is significant and generates a freight task, including for export. Ballarat also produces goods which are transported to Melbourne and other places for domestic and export markets; and
- large quantities of freight are also carried along the corridor northwards from southern to central and northern Victoria to supply communities and serve the requirements for inputs (including fertilisers and capital equipment) used in food production, food processing, other manufacturing and the production of services (for example, education, health, retailing) in the regions.

There are also significant freight movements within the corridor, mostly undertaken by trucks and light commercial vehicles. The regional cities of Mildura, Bendigo and Ballarat generate substantial demand for goods that are inputs to their manufacturing, processing, retail and other service industries, and these are carried by road vehicles internally within the cities and from other centres, including Melbourne. Trucks, including heavy vehicles, also carry the grains harvested in the Mallee and Wimmera to silos and other loading facilities that are typically located next to the various north-south railways in those regions, including the Mildura—Gheringhap line defined as part of the AusLink corridor. These grain trucks use the numerous east-west roads and the Calder Highway as well as other major north-south highways in the regions for different parts of their journeys to storage facilities. The grain trucks are also used to carry other products, such as gypsum for use on the farms (which is often carried as backloads following delivery of grain to receiving points), and in this role make similar demands on the major and minor roads. Trucks also carry fruit and vegetables in refrigerated containers from the Mildura region to southern markets.

Passenger Task

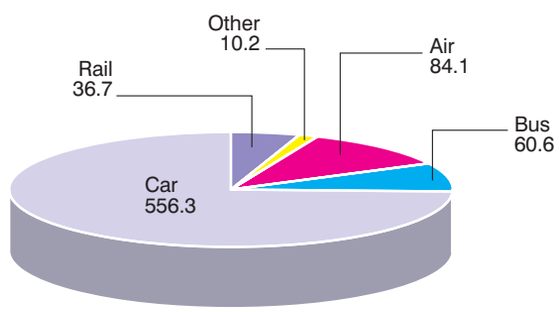
Most end-to-end, local and regional passenger travel along the corridor is by road (see Figure 2). Other modes play a minor but in some cases increasing role:

- air is increasing its share of trips. Mildura Airport is the busiest regional airport for passenger movements in Victoria and can accommodate aircraft to Boeing 737 size. The airport has been experiencing rapid growth in passenger loadings of over 20 per cent a year over the last three years. The current figures are over 155,000 passenger loadings each year and 6,200 general aviation aircraft movements. For agencies based in the NSW part of the catchment region with

head offices in Sydney, a flight from Mildura to Sydney is often the preferred alternative to a 1000 kilometres drive. There is also significant business and government related travel between Mildura and Melbourne. The BTRE forecasts that by 2025, almost 20 per cent of end-to-end travel will be by air;

- there is no continuous passenger rail service between Melbourne and Mildura. The Vinelander service to Mildura was discontinued in 1993 and was replaced by a train to Swan Hill and then a connecting bus to Mildura along the Murray Valley Highway and Sturt Highways. This bus also performs the important service of connecting towns along the Murray River. In 1999, rail accounted for only around five per cent of end-to-end passenger journeys;
- regional Fast Rail services between Melbourne and Bendigo and Melbourne and Ballarat commenced in 2006. This has resulted in an increase in the frequency and speed of passenger services to these regional cities. There may be a corresponding increase in rail's share of passenger journeys between Melbourne and Bendigo and between Melbourne and Ballarat. Bus services connect with the Ballarat and Bendigo stations and facilitate public transport travel within these centres and to other regional cities and towns; and
- there is a range of direct bus services that use the corridor and parallel roads.

FIGURE 2 Melbourne–Mildura Passenger Travel by Transport Mode ('000 Passenger Journeys)[4]



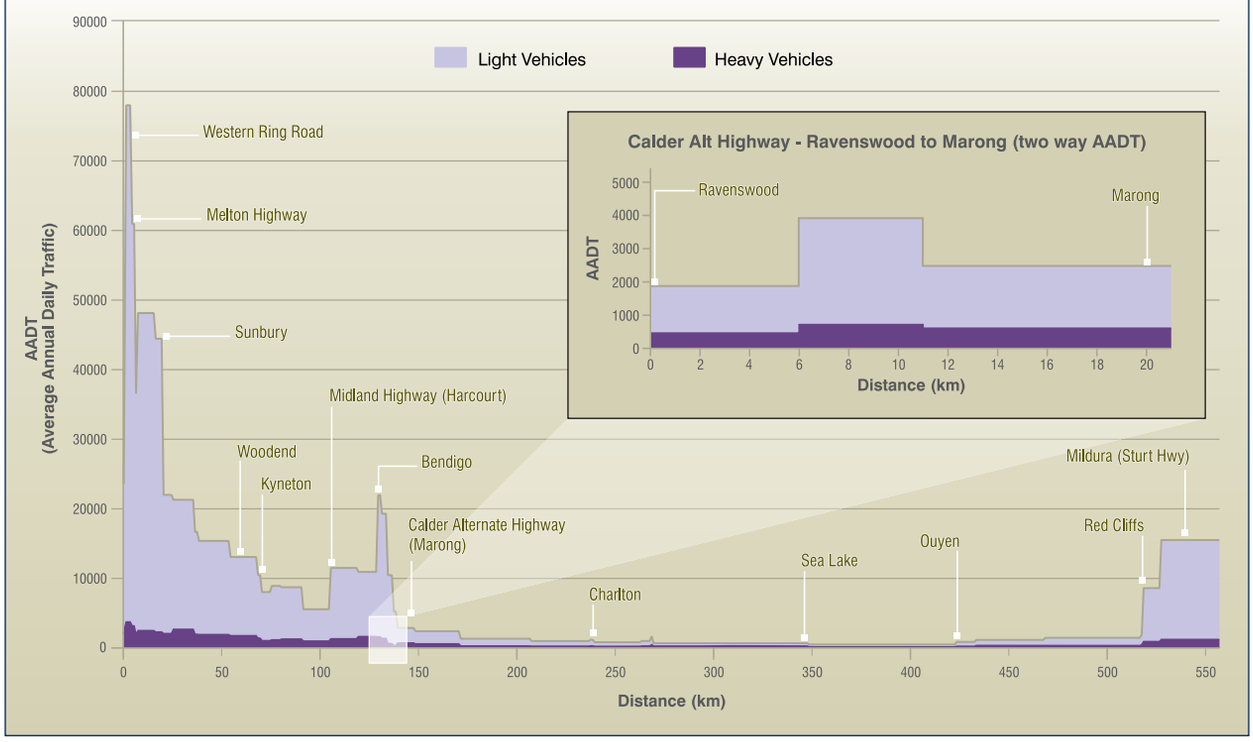
Road Transport Activity

The pattern of road transport activity reflects the corridor's role for movement of freight and passengers. Figure 3 shows that:

- traffic volume is very high (around 50,000 vehicles a day) on the outskirts of Melbourne. It then declines northwards from Melbourne but remains at a high level of more than 10,000 vehicles a day as far as Bendigo. Bendigo is the largest city located along the corridor beyond Melbourne. The city can be bypassed by the Calder Alternative Highway via Marong, but Bendigo's size and proximity to Melbourne contribute to making it a large generator of private and business traffic. The Melbourne to Bendigo section of the corridor carries at least four times as much passenger traffic as the Bendigo to Mildura section, according to BTRE figures. The BTRE forecasts that traffic volumes will continue to grow at a faster rate in the Melbourne to Bendigo section of the corridor to 2025;
- traffic volume then reduces to around two to three thousand vehicles a day to Inglewood. Vehicle numbers decrease to around 700 vehicles a day (27 per cent heavy vehicles) south of Sea Lake before rising again. High traffic volumes are experienced around Mildura, which is the centre of a major agricultural area and is a major service centre for surrounding districts with a significant retail and commercial core. These functions generate passenger car trips for a range of purposes including business, education, health services and shopping. Mildura is also used as a stopover for tourists travelling north to Broken Hill and on the major interstate route from Sydney to Adelaide; and
- the proportion of heavy vehicle traffic is high, with trucks making up around 10-30 per cent of traffic along the route.

[4] VicRoads (1999)

FIGURE 3 Calder Freeway Average Yearly Daily Traffic Volumes (2 Ways)[5]



Rail Freight Activity

The Melbourne–Mildura rail corridor is used predominantly to transport bulk grains and other agricultural products from regional collection points to southern markets and ports (Melbourne, Geelong) and accounts for a high proportion of this movement along the corridor. It is of national economic importance because of its role in transporting around 1.5 million tonnes of export grain and containerised produce a year[6]:

- wine, grapes, citrus, dried fruit and juice concentrates are transported in containers on trains from the Merbein intermodal terminal located 11 kilometres north-west of Mildura to the Port of Melbourne. The Merbein intermodal terminal handles approximately 13,000 export containers a year of wine, grapes, fruit and vegetables. These are railed to Dynon intermodal terminal in Melbourne and trucked across to the docks. Back loading is relatively small with only 500 import containers a year. The train provides an overnight service in each direction between Melbourne and Merbein and also picks up and drops off wagons at Maryborough for transfer to the Boort intermodal terminal. As horticultural production increases in the region it is likely that an additional intermodal train service will be required to handle the freight task; and
- export grain is collected from the numerous silos on the line between Mildura and Maryborough. The corridor also supports other grain lines in north-western Victoria. Grain is also collected on the Panitya line for transport on the Mildura line south of Ouyen. The grain silos at Dunolly are used for storage and collection throughout the year. Dunolly is also the junction point for trains getting to the Mildura line and the Port of Geelong from the Kulwin and Robinvale lines.

On average, trains leaving the region are 95 per cent full but those returning only carry five per cent of their capacity.

The Mildura line is dual gauge for 22 kilometres between Dunolly and Maryborough for transport of grain via standard gauge on the Maryborough to Ararat line.

[5] AADT (2005), VicRoads (2006)
[6] Sd&D (2007)

However, no grain has been transported to Portland using this line since late 2003. This is primarily because the Port of Geelong is 130 kilometres closer to silos on the Mildura line than the Port of Portland and there is a cost in trans-shipping grain from broad to standard gauge wagons. Geelong also has a more efficient system of unloading grain trains using a balloon loop that enables grain trains to remain intact while being unloaded. By contrast, grain trains at the Port of Portland must be split into rakes of 15 wagons and shunted onto the wharf for unloading.

Competition between Transport Modes

Competition between the modes has produced a pattern of modal shares where each of the transport modes dominates in a particular transport market:

- rail has an advantage in the transportation of bulk commodities along the corridor. In particular, 90 per cent of export grain is transported by rail, with silos and other grain holding facilities established at many points on the rail system. After a normal growing season, very large quantities of grains are moved to southern markets and ports. Rail is also used for moving significant quantities of fresh produce (in containers) from the Murray River growing area at the northern end of the corridor to southern markets; and
- trucks are usually more competitive for smaller consignments required in shops, manufacturing enterprises and farm machinery outlets in the large and small towns along and around the corridor, because of their advantage in door-to-door movements. Trucks also have an advantage in moving non-bulk items, often in containers, that are produced in the regions adjacent to the corridor to southern and other markets.

The use of trains for carrying freight is under pressure from infrastructure quality constraints and direct competition from trucks. The condition of much of the rail corridor is limiting the speed and reliability of train movements, while the condition of the Calder Highway and linking highways and roads is largely sufficient to allow reasonably fast and reliable truck movements. Furthermore, truck technology is advancing, while the trains used on the rail corridor largely embrace old technology.

CURRENT PERFORMANCE

Road

For most of its length, the corridor generally provides for efficient, reliable and safe road travel.

Between Melbourne (Western Ring Road) and Bendigo, the Calder Highway has been upgraded to a high standard, four lane divided road for all but 32.5 kilometres between Malmsbury and Ravenswood, where it reverts to a two lane highway. This 32.5 kilometre stretch of road will be upgraded over the next three years.

From Bendigo to Red Cliffs, the road comprises a two lane highway and between Red Cliffs and Mildura (Sturt Highway), the road comprises a mixture of two and four lanes.

Capacity

The Calder Highway generally meets current demand. Its design is sufficiently robust in terms of lane and shoulder width to carry large freight vehicles effectively and the corridor can capably handle the higher mass limit vehicles[7]. However:

- traffic conditions in the Melbourne metropolitan area and outskirts are heavy, and presently congestion occurs for up to two hours in each of the morning and evening peaks. Whilst completion of the Calder–Tullamarine interchange will assist in addressing present congestion, additional lanes will be required between the Western Ring Road and the Melton Highway. Towns to the north of Melbourne such as Sunbury, Gisborne and Kyneton are growing and generating increasing commuter and freight flows to and from the metropolitan area. With significant growth occurring along and beyond the corridor, particularly closer to Melbourne, capacity and congestion challenges will emerge in the medium-term, affecting the corridor's ability to provide an appropriate level of service;
- the completion of the duplication of the Calder Highway to Bendigo will facilitate more efficient and reliable transit times with safety. Nevertheless, there are concerns about the capacity of the long arterial roads in the Bendigo urban area which form part of the Calder and other major highways. Traffic levels are high on the Calder Highway within and near Bendigo, contributing to slowing of traffic and safety and amenity concerns;

[7] Mass limits is a national policy that allows heavy vehicles meeting certain requirements to carry higher mass on a designated network of roads. Further information is available on the National Transport Commission's Website at www.ntc.gov.au

- capacity on the Calder Alternative to Marong is adequate for the cars and the substantial numbers of heavy vehicles that the Alternative attracts (drawing them away from Bendigo);
- north of the Bendigo area, traffic on the Calder Highway is typically light until the intensive agricultural area near Mildura is reached. The two-way highway is adequate for the traffic needs; and
- traffic levels are sharply higher in the Mildura region and pressures on capacity are building.

The Sunraysia Highway parallels the Calder Highway and the Melbourne–Mildura rail line and plays an important part in freight and passenger movements in the Mallee and Wimmera regions. Numerous other roads running roughly east-west play important roles in carrying freight, especially grain and retail supplies, to silos and towns in the Mallee and Wimmera. The ability of these roads to carry a mix of large freight trucks and cars safely and without a deterioration of road pavements, surfaces and shoulders, is under pressure.

In addition, the parallel rail system carries a substantial amount of the bulk food products of the Wimmera and Mallee regions thus saving a good deal of potential pressures on the Calder Highway. The Sunraysia and Loddon Valley Highways also relieve some of the traffic pressures on the Calder Highway especially in the grain and fruit harvests and holiday seasons.

Reliability, Efficiency and Productivity

Reliability and efficiency are a measure of the ability of the network to enable consistent and predictable travel times. The corridor generally provides efficient road travel conditions. It takes approximately six and a half hours to drive the corridor and, while there are several towns along the Calder Highway, it is still possible to maintain a speed above 90km/hr for more than 90 per cent of the corridor.

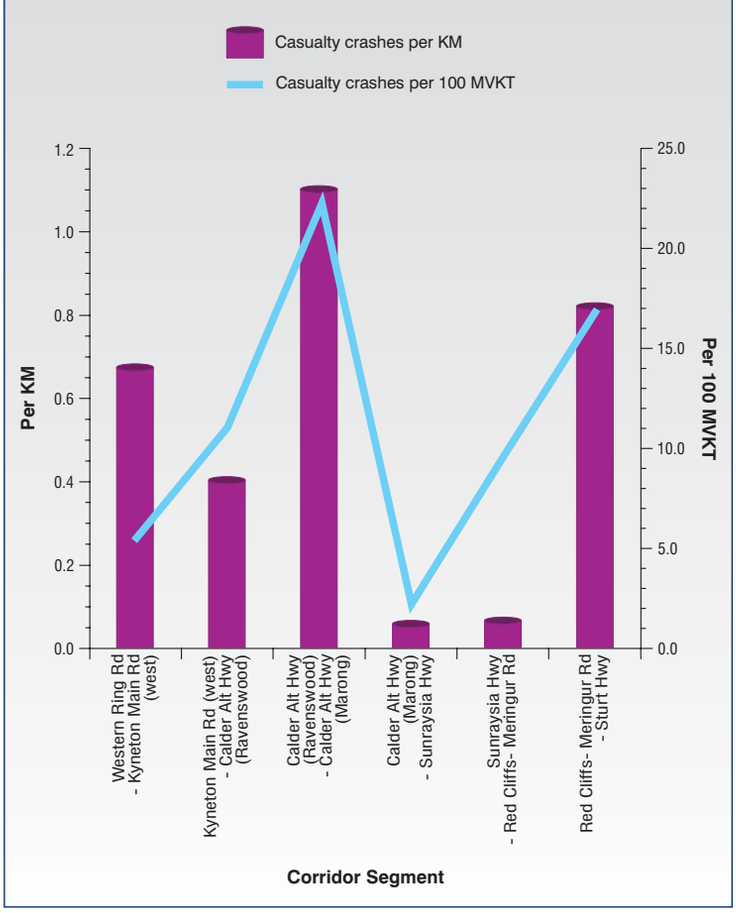
The road pavement is generally in acceptable condition, but there are sections of relative roughness which can slow down vehicles and damage goods:

- over the next 10 to 20 years, a significant proportion of the pavement and surface will have reached its designed useful life and will require significant rehabilitation beyond normal maintenance to prevent impacts upon reliability and rideability;
- at present the roughness rating of pavements across the corridor is considered appropriate. However, there are several sections of relatively poor pavement condition, especially north of Bendigo, around Charlton and near Nullawil. Increases in freight traffic along these sections will exacerbate the rate of deterioration; and
- the reliability and rideability along the corridor needs to be monitored to ensure that safety and comfort of the user meets acceptable levels.

Other sections where efficiency and reliability concerns arise include:

- north of Ouyen where the undulating topography

FIGURE 4 Average Yearly Casualty Crashes[8]



[8] 2000-2007 Crash Statistics - VicRoads.

means that sight distances and hence overtaking opportunities are limited, causing vehicle slowdowns; and

- between Kyneton and Bendigo where there are inadequate overtaking opportunities. This issue will be resolved following the duplication of this section by 2009.

Seasonal weather conditions, such as icy roads around Woodend and Mallee dust, also raise efficiency and reliability concerns.

With the exception of the area either side of Charlton, there are no specific flooding problems.

Safety and Amenity

The Calder Highway, Sunraysia Highway and the many east-west roads that play important roles along the length of the Melbourne–Mildura Corridor present safety issues as they carry a mix of cars and heavy freight vehicles. These are compounded on the southern part of the corridor due to the rapidly increasing commuter and weekend traffic.

Figure 4 shows the pattern of casualty crashes along the corridor in terms of crashes per kilometre and crashes per 100 million vehicle kilometres travelled. A significant percentage of the casualty crashes, and high crash density, occurs in the highly trafficked areas near Melbourne, Bendigo and Mildura. This is possibly due to the mix of traffic, road safety hazards, the numerous minor intersections and uncontrolled property access. Between 1 January 2000 and 31 December 2004, the main types of crashes were from:

- vehicles veering off path on a straight section of road and colliding with an object or parked vehicle (30 per cent);
- vehicles travelling in the same direction, such as rear ends and side swipes (25 per cent); and
- vehicles from opposing directions involved in head-on crashes (14 per cent). This type of crash accounted for 30 per cent of the fatal collisions.

While the corridor generally meets current road operating safety standards, there are a number of current safety and amenity concerns. These include:

- mixed traffic conditions with a high percentage of heavy vehicles sharing the road with local traffic and tourists thereby creating potentially hazardous conditions, especially on the two lane, two way sections of the road;
- at-grade access which increases the potential for crashes and impacts upon traffic flow on the duplicated sections of the road. There are numerous roads that have direct unrestricted access to the Calder Highway, particularly between the Western Ring Road and Diggers Rest;
- safety at road and rail level crossings is an issue at many locations along the two way sections of the corridor. Safety objectives require attention to the quality of the surface, shoulders, line of sight and signage at these intersections;
- there are several road-rail crossings which are located on side roads, close to the highway, where vehicles may queue on either the road carriageway or railway line. In these cases, it is possible for the rear of an articulated truck to straddle the railway line and/or the road intersection, with the risk of a serious crash;
- fatigue management issues along the corridor which still occur despite the positive effect of the towns along the route contributing to the management of driver fatigue through the provision of rest areas;
- there are a number of towns through which both the road and rail corridor pass. With the forecast increase in traffic numbers, including heavy vehicles, there are growing concerns regarding conflicts between pedestrian, local traffic and through traffic in some towns;
- north of Ouyen, the crests and troughs associated with the rolling terrain limit the sight distances and therefore passing opportunities;
- poor vertical alignment and shoulder width on the Calder Alternative Highway; and
- the high proportion of casualty crashes occurring on the highly trafficked sections of the corridor.

Strategies that have been developed to guide road safety improvements include:

- the National Road Safety Strategy 2001-2010 (NSS) that aims to dramatically reduce death and injury on Australian roads, with a target of a 40 per cent reduction in the number of fatalities per 100,000 population by 2010, from 9.3 in 1999 to no more than 5.6 in 2010; and
- the Victorian Government's *'Arrive Alive! 2002-2007'* road safety strategy that seeks to reduce the number of deaths and serious injuries by 20 per cent over the five year period. The strategy describes 17 key road safety issues including road design, speeding, drink driving, fatigue and vehicle safety.

Rail

The Gheringhap to Mildura railway line is in very poor condition:

- over half the track is subject to speed restrictions below the 80km/hr line speed that applied in 1993. From Mildura to Ballarat, the speed limit is between 50 and 80km/hr. From Ballarat to Geelong, trains operate at just 50km/hr (see Figure 5);
- present rail transit times between Melbourne and Mildura of 14 hours or more make rail transport less desirable than trucks for many commodities. The slow transit time is exacerbated by reliability problems, including shunting on the route and lack of adequate passing loops;
- passing loops restrict the length of trains. Although trains of 1,200 metres are not unusual and some trains that use this corridor are 1,500 metres, there is only one loop between Mildura and Ballarat of 1,000 metres long with most of the rest being substantially shorter. The absence of long passing loops can cause long delays with trains having to wait at Maryborough for long periods;
- axle loads are restricted to 19 tonnes which is inadequate for modern day freight train operations. The axle loads are the same as they have been for over 30 years. They limit the load that can be carried in each container and the number of containers which can be carried each wagon. This increases the number of wagons required each train. By contrast, trucks have continued to increase in size allowing bigger payloads to be transported. Increased axle loads up to 23 tonnes would improve rail efficiency; and
- the poor condition of much of the rail line heightens the potential for train derailments and requires constant attention to particularly poor segments to ensure trains can run safely, even if at low speeds.

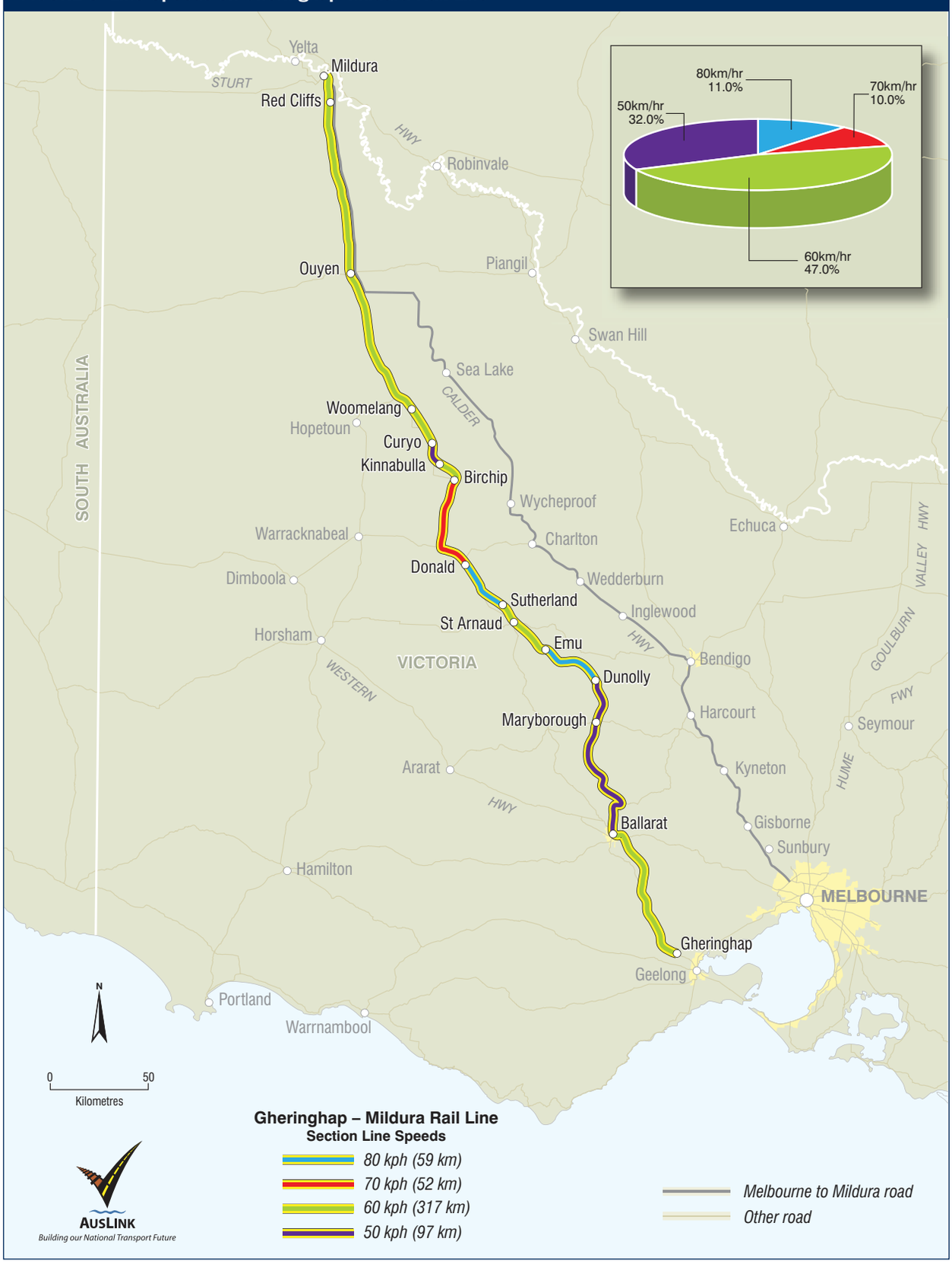
In addition, productivity and efficiency are partially affected by two further factors:

- passenger train schedules between Melbourne and Geelong limit access for freight trains, although this does not currently have a major influence on rail freight operations in the corridor; and
- track clearance height on the corridor is subject to Connex restrictions between Werribee and Newport due to overhead wires and the Bunbury Street tunnel restricts the height of all freight trains.

Notwithstanding these deficiencies, the rail corridor provides significant benefits to the region through freight competition to customers as well as reducing road maintenance costs, road crash risks, greenhouse gas emissions, noise and air pollution and port congestion. The Victorian Government has bought back the track lease from Pacific National and appropriate line maintenance procedures will be implemented.

The Australian and Victoria Governments have confirmed funding towards a $73 million upgrade of the Geelong to Mildura railway line to an 80km/hr freight train standard. The funding comprises $53 million State Government allocation and $28 million under AusLink, from the Australian Government.

FIGURE 5 Line Speeds on Gheringhap–Mildura Rail Line



Chapter 3

FORESEEABLE CHANGES TO 2030

INFLUENCES THAT WILL SHAPE THE FUTURE OF THE CORRIDOR

The future of the corridor will be shaped by factors that influence demand for movement of passengers and freight along the corridor and by the outcomes of projects already underway or committed.

Demand for Movement of Passengers and Freight

Factors listed below are expected to shape demand for travel in the corridor:

- growth in population – the major population and commercial centres of Ballarat, Castlemaine, Bendigo, Maryborough and Mildura are expected to be the main drivers of freight and passenger demand in the future. These regional cities and some other towns along the corridor, will continue the trend of the last few decades of providing the core places for support industries and retail and community services for the agricultural districts. There will also be strong population growth in the shires on the north-western side of Melbourne which includes designated urban growth areas. Reflecting increased farm productivity and amalgamations, the number of people involved directly in farming is falling. Together with the improved capabilities of cars and trucks, this trend has resulted in a slow decline in the populations of some smaller towns and the numbers of people in some municipalities along the corridor are expected to decline over the next 25 years. Nevertheless, the total population of municipalities along the corridor is expected to grow by around 375,000 (43 per cent or 1.2 per cent a year) between 2001 and 2031[9];
- continued growth in agricultural production – horticulture and associated food processing is expected to experience continued strong future growth. Dry land farming involving sheep and cattle grazing and crop production is expected to experience modest growth in the Wimmera, Loddon and Mallee regions. Farming practices and crop varieties are expected to adapt to drier conditions and more extreme weather expected to result from climate change. Grain production is expected to grow modestly, although it will continue to be subject to rainfall and weather conditions during sowing and harvest times;
- manufacturing and services – Castlemaine and Ballarat provide manufacturing support for the corridor as well as some financial, retail, health and education services. Bendigo is the major services centre in the corridor providing health, education, financial and retail services to the region. Extra private vehicle trips to access services in the major town centres are expected in the future;
- tourism – Mildura's temperate climate and proximity to the Murray River attracts many local and interstate visitors[10]. Tourism is expected to generate additional traffic in future; and
- expansion of mining – the Murray Basin is expected to be a major mineral sands province and a key contributor to Australia's exports of mineral sand products[11]. The Victorian section of the Murray Basin will be producing a significant proportion of the Basin's rutile, zircon and ilmenite products. It is expected that there will be several mines and associated concentration plants operating. Mineral separation plants will also be operational in regional Victoria and at a major port. Downstream processing plants will be established in Victoria to value add to the mineral sands products.

Projects Already Underway

Future performance of the corridor will also be affected by projects started under the first AusLink five year investment programme and committed under State Government programmes. The major projects are discussed below.

Mildura Rail Upgrade

As part of the Meeting Our Transport Challenges initiative, the Victorian Government committed $53 million to upgrade tracks for freight purposes between Ballarat and Mildura and the Australian Government has contributed $20 million under AusLink. The rail upgrade project would allow an improvement in the freight train speed to a consistent 80 km/hr. This would reduce transit times to 10 hours, improve reliability, increase rail's competitiveness with road and provide certainty for the freight industry in north-west Victoria thus allowing industries to plan to use rail as part of their freight transport strategies.

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9 DSE (2004)
10 DSE (2004)
11 Minerals Council of Australia (2006)

Calder Highway – Faraday to Ravenswood

This project involves the construction of a four lane divided road between Malmsbury and Ravenswood. The project is being constructed in two stages: Kyneton to Faraday and Faraday to Ravenswood. The project is being jointly funded by the Australian and Victorian Governments under AusLink:

- Kyneton to Faraday – the upgrade of the 21.2 kilometre section started in November 2005 and is expected to be completed by early 2009. The Malmsbury stage includes 14 bridges. The total estimated cost of the Kyneton to Faraday section is $180 million; and
- Faraday to Ravenswood – the upgrade of the 13 kilometre section has been divided into two stages: Harcourt North (Midland Highway, Harcourt to Fogartys Gap Road, Ravenswood, 6.3 kilometres) and Harcourt South (Golden Point Road, Faraday to the Midland Highway, Harcourt, 6.6 kilometres). The project is also expected to be completed by 2009 and the total estimated cost is $214 million.

Calder Alternative Upgrade

Works on the Calder Alternative have included sealing of shoulders to an acceptable (A Road) standard and improvement to bridges to ensure safety and use by trucks operating at higher mass limits.

Competition between Modes

With upgrades underway or planned for both road and rail modes the future pattern of movements of freight is expected to be similar to the current situation. Rail transport is likely to continue to be the dominant mode for bulk grains and long-distance movement of containers to port, while road will be the preferred mode for short distances, general cargo and links to/from rail terminals. The role of rail for the transport of freight and bulk agricultural goods southward has the potential to grow but the extent to which rail can increase its mode share will be influenced by the condition and operating performance of the Mildura–Gheringhap line.

For passenger movements, air transport is expected to increase its share of end-to-end trips but road will continue to be the dominant mode of transport for most trips.

MOST LIKELY FUTURE SCENARIO

Expected Growth

In assessing the likely future economic and population growth that will drive demand for transport services on the Melbourne–Mildura Corridor, it is useful to consider the outlook of the three distinct regions which the corridor serves.

The City of Mildura and its hinterland straddling the Murray River are underpinned economically by irrigation. This region is characterised by intensive horticulture and viticulture and the industries that process some of the foodstuffs grown there. There is a substantial freight task involved in carrying fresh and processed food and wine products to Victorian, interstate and export markets, and much of this freight task uses the Melbourne–Mildura road and rail links. This region is expected to enjoy sound economic growth based on irrigation and continued productivity gains in horticulture, viticulture, food processing and service industries. The passenger task within this region is expected also to grow as the population expands. Mildura and satellite towns are expected to expand and there will be a growing commuter task within the Mildura district which will necessitate good standard roads to facilitate traffic flows and safety outcomes. In addition, it is likely that the flow of tourists to the region will grow.

The second distinct region on the corridor is the dry land farming districts of most of the Mallee, the Wimmera and central Victoria. The region experiences weather related variations in economic outcomes from year to year, being susceptible to those years where rainfall is below average. Seepage and evaporation cause the loss of 85 per cent of the water supplied to the Wimmera and Mallee by 9,000 kilometres of open channels. The recently commenced Wimmera Mallee Pipeline Project (WMPP) will replace the channels with pipelines. The WMPP will give more certainty to farm water supplies and add to the volume of water available thus improving the capacity of Wimmera and Mallee farmers to support stock in dry periods and consider some diversification of the crops they produce.

The population of much of this region has fallen in recent decades as farm productivity improvements have resulted in a fall in labour requirements and as the increased capabilities of cars and trucks has seen the smaller towns losing ground to the larger

towns such as Bendigo and Castlemaine in serving the needs of the region for support industries, retail and community services. These population trends are expected to continue in the future[12]. Within the region the roads connecting the smaller towns will continue to fulfil the local passenger travel requirements of farmers and townspeople and the freight tasks associated with carrying grain from the farms to silos, agricultural machinery to farms, and retail goods to towns. The main roads to the larger population centres, such as the Calder, Sunraysia and Henty Highways, will carry growing volumes of freight and passengers and will have to be upgraded progressively to address traffic demands, especially in and around the larger towns, and safety concerns. The rail lines through this region carry much of the grain transported to markets and export ports in southern Victoria and, on a trend basis, the volume of grain produced in the region is likely to grow, although reduced water supply will present fresh challenges to grain production.

The third distinct region along the Melbourne–Mildura Corridor, at its south, is characterised by agricultural districts that enjoy higher average rainfall but experience colder growing conditions. Pastoral agriculture is relatively more important in this region than further north. This region also includes the major inland city of Ballarat, north western outer suburbs of Melbourne and towns that partly serve as 'dormitories' for people who work in the Melbourne metropolitan area and thus give rise to demands on the road and rail systems that connect with Melbourne. There are manufacturing and service industries in this region which are expected to grow, partly underpinned by their direct or indirect role in supporting the industries and retail markets of Melbourne. Considerable investment has been made in recent years to upgrade road and rail capacity to meet the growing passenger and freight needs of the region. It is likely that the freight and passenger tasks within this region will continue to grow steadily, reinforced by the expected growth of Melbourne's population. This will necessitate continued attention to the capacity and condition of the transport network to ensure good travel time and safety outcomes.

According to BTRE forecasts, economic and population growth along the corridor is expected to drive transport growth along the Calder Highway and light vehicles will dominate the number of vehicle kilometres travelled. Road traffic will continue to be concentrated in the Mildura, Bendigo and outer metropolitan Melbourne regions. Overall, road traffic is forecast to increase by around 55 per cent over the next 20 years between Melbourne and Bendigo and by around 35 per cent north of Bendigo. Table 2 summarises the forecast yearly average daily traffic increases for various sections of the corridor.

TABLE 2 Forecast Yearly Average Daily Traffic, 1999 and 2025[13]

Corridor Section	Length	Light Vehicles		Heavy Vehicles		All Vehicles		Yearly Average Traffic Growth (% each year)		
	(km)	1999	2025	1999	2025	1999	2025	Light	Heavy	Total
Melbourne–Kyneton	90	14214	24925	1715	3473	15930	28397	2.18	2.75	2.25
Kyneton–Bendigo	42	5904	10167	978	1618	6882	11784	2.11	1.95	2.09
Bendigo–Ouyen	306	1788	2715	247	355	2035	3070	1.62	1.4	1.59
Ouyen–Mildura	110	1544	2251	229	314	1773	2565	1.46	1.22	1.43
Total	**548**	**4098**	**6846**	**541**	**956**	**4639**	**7803**	**1.99**	**2.21**	**2.02**

[12] DSE, Victoria in Future (2004) Overview Report.
[13] BTRE (2006)

The overall outlook for rail transport in the corridor is also expected to remain strong. Table 3 summarises the outlook for major commodities.

TABLE 3 Rail Traffic on the Melbourne–Mildura Corridor[14]

Traffic	Current Volume (tonnes per annum)	Potential Growth
Grain Export Domestic	1.15 million 250,000	Limited – rail already has a high mode share of this traffic; a small inherent growth in cropping productivity is expected.
Other bulk traffic	55,000	Future development depends on business initiatives and logistics solutions by Pacific National.
Intermodal and general freight	250,000	Steady growth expected with traffic doubling over 30 years.
Mineral sands	Nil	Potential transport from the development of known deposits – approximately 200,000 tonnes annually in the short term.
Salt	Nil	Potential export salts from deposit on the Kulwin branch line of one million tones a year.

Ability of Corridor to Manage Forecast Demand

The capacity of the road and rail infrastructure along the corridor should be increased to meet forecast demand over the next 20 years. This will be assisted by the planned program of road and rail works to address many of the current and emerging constraints and concerns. However, there are exceptions:

- on the outskirts of Melbourne, through Bendigo and around Mildura, population and economic activity is expected to increase substantially and generate strong growth in the freight task and business, commuting, recreation and tourist travel within the region. This will strain the capacity of the road and rail systems to provide time effective and safe passenger and freight transport; and
- the competitiveness of rail and its capacity to grow will be influenced by the condition and operating performance of the Mildura–Gheringhap line.

In addition, community expectations for safe and efficient travel coupled with growth in traffic will place additional demands on the road infrastructure:

- the growth in demand will accelerate the need for progressive upgrading of the road corridor and safety improvements over the next 25 years, especially for the unduplicated section of the Calder, north of Bendigo. Given the mix of heavy vehicles, passenger vehicles and tourist traffic, attention will need to be given to ensure sufficient passing opportunities, rest areas and safety signage, thereby encouraging drivers not to speed and risk fatigue by attempting to cover large distances without stopping;
- the Sunraysia Highway plays an important role in supporting the Calder and numerous 'east-west' roads connect with the Calder and Sunraysia Highways and with the rail lines in the Mallee and Wimmera. The condition of these roads is not adequate in parts, in terms of width, quality of pavements and surfaces, and condition of shoulders, especially as freight trucks are becoming larger and, in the southern part of the region, weekend tourist travel from Melbourne is burgeoning;
- safety at rail-road level crossings on the Calder and Sunraysia Highways is a major concern. The broad gauge rail line that is defined in the Melbourne–Mildura Corridor runs close to the Sunraysia Highway for much of the highway's length from Ouyen to Ballarat and crosses this highway at several locations. Between Ouyen and Mildura the railway lines run close to the Calder Highway. The Kulwin to Bendigo freight line runs close to the Calder Highway and crosses it at a number of points. There are numerous road-rail

[14] BAH (2006)

level crossings on side roads that intersect with the Calder and Sunraysia Highways where vehicles may queue onto either the road carriageway or railway line. The expected growth of road and rail traffic on the major and minor highways along the corridor means that it will be necessary to address safety issues through measures that improve signage, warning systems and intersection angles;

- the growth in demand will also increase traffic flow through towns along the route with implications for safety, amenity and capacity. In particular, the Mildura region in the northern part of the corridor is expected to enjoy good economic growth and there will be a need to improve road capacity and consider the scope for reducing the mixing of local traffic in towns and heavy freight vehicles;
- much of the existing road pavement will exceed its design life during the next 25 years and coupled with growth in traffic, this will create increased pressure for rehabilitation and resealing of large sections of the road corridor to ensure that road pavement and surface condition, together with the highway's shoulders, are all in good condition; and
- there are numerous road junctions along the corridor with deficiencies in terms of sight distance, intersection angles, pavement markings and directional signage.

As well as emerging safety and efficiency issues on the corridor, there are several roads that connect with the Calder Highway in southern Victoria that have conditions that are not optimal for safe travel. For example, the road that connects the Calder Highway to Castlemaine, (a popular destination at weekends) is narrow in parts, with some sub-optimal surfaces and curves.

PRESENT AND EMERGING CORRIDOR DEFICIENCIES

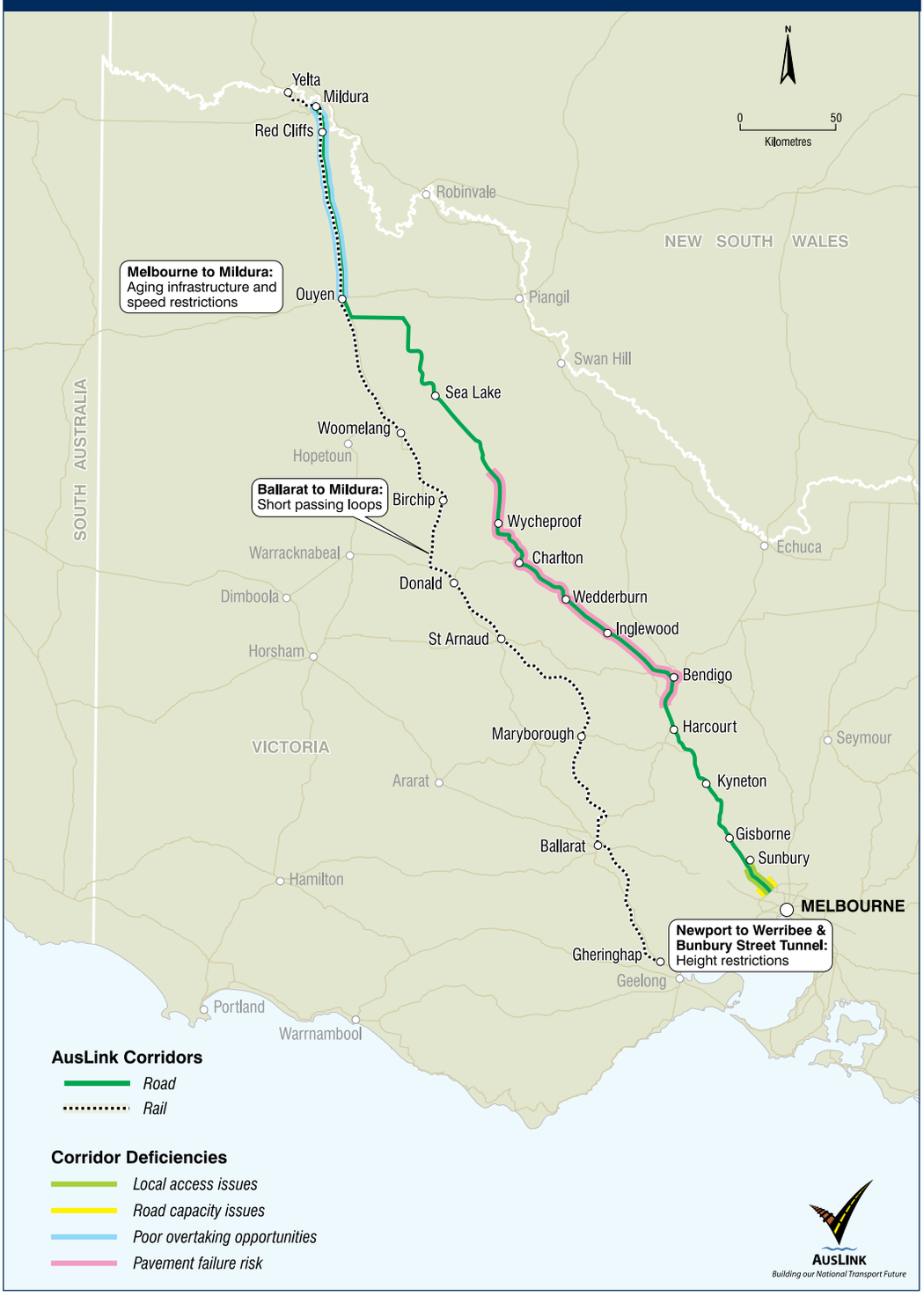
The Calder Highway is currently in satisfactory condition overall and major work is being undertaken to complete its duplication from Melbourne to Bendigo in response to the high levels of traffic between the two cities and to improve safety outcomes in the northern section of the Melbourne to Bendigo link, which is quite hilly and winding. However a range of existing deficiencies remain and more will develop in the foreseeable future.

Short-Term Deficiencies

There are a range of present and foreseeable deficiencies that will adversely affect the safety, efficiency, productivity, reliability and amenity of the corridor. These deficiencies as shown in Figure 6 are classified as:

- short-term deficiencies – these are deficiencies that are already apparent or foreseeable over the period to 2015 in the context of expected growth in demand and the likely benefits of projects already underway or committed. This is the period of the current and next National Land Transport Plan; and
- longer-term deficiencies – these are deficiencies that are foreseeable for the period from 2015.

FIGURE 6 Melbourne–Mildura Corridor Deficiencies



Short-Term Deficiencies

The short-term deficiencies are summarised in Table 4.

TABLE 4 Short-Term Deficiencies (to 2015)

SHORT-TERM (to 2015)	**Rail** The current quality of much of the track slows trains and causes reliability concerns. Permitted axle loads of 19 tonnes are inadequate for modern freight train operations. The insufficient number and length of passing loops cause delays in train movements and restricts the use of long trains, also contributing to unreliability of freight transit times. Level crossings at major intersections cause delays to road traffic and some level crossings cause safety concerns with large trucks protruding onto either the rail line or road carriageway. **Road** Access management of the duplicated sections of the corridor to improve road safety, efficiency of traffic flow and ensure that the road operates at a full freeway standard, particularly between the Western Ring Road and Diggers Rest. The current freeway sections of the corridor may reach capacity as a result of continued urban expansion. Shortages of passing opportunities in some parts of the two lane sections of the Calder Highway can slow progress and contribute to safety concerns, including to the north of Ouyen where the crests and troughs associated with the rolling terrain limit sight distances. Too few and poor quality rest areas have been identified by some users of the Calder as contributing to fatigue management and safety concerns. Safety and amenity outcomes are also under pressure from the expanding population and tourist traffic in the towns to the immediate north of Melbourne, through Bendigo and in the Mildura region. Some sections of the Calder Highway pavement are relatively rough, which impacts on the reliability and safety of the corridor.

Longer-Term Deficiencies

Foreseeable deficiencies for the longer-term are listed in Table 5.

TABLE 5 Longer-Term Deficiencies (from 2015)

LONGER-TERM (from 2015)	There are likely to be substantial pressures on the southern section of the road corridor as the populations of the towns close to Melbourne expand. In the Mildura region, car and truck movements are growing quite substantially as the region expands economically and continued movement of substantial numbers of heavy vehicles through Mildura would be likely to cause significant safety and amenity concerns as well as impeding transit times for trucks and cars. There will be an increased volume of trucks on the Calder Highway and other roads in the corridor regions causing continued concerns about the need for passing opportunities and bypasses of towns. The rail corridor will need continued attention in terms of track quality and passing loops to ensure that transit times, reliability and axle loads are adequate to enable rail to perform a continuing role in handling the growing freight task.

Chapter 4

CORRIDOR CHALLENGES

Corridor challenges sum up the current situation and strategic issues facing the future performance of the corridor. In conjunction with the AusLink Network objectives, they form the basis for developing strategic priorities for the corridor.

The challenges for the corridor relate to efficiency and reliability of travel times, safe movement of passengers and freight and the capacity of the road and rail infrastructure along the Melbourne–Mildura Corridor to meet demand over the next 25 years. The specific challenges are:

- providing sufficient road capacity in the northern section (Mildura and its hinterland) to deal with a fast growing regional economy and population growth and the impact of east-west movements on the Sturt Highway;
- in the southern section of the corridor, ensuring that the condition and capacity of the Calder Highway and inter-urban and commuter public transport, remain good and sufficient to deal with expected increases in commuter, tourist and freight traffic as satellite towns to Melbourne's north and west grow and major regional centres such as Ballarat, Bendigo and Castlemaine, together with smaller towns, experience more tourist traffic. These factors will also contribute to a need for the roads providing access from the Calder Highway to regional towns not on the Calder, to be in good condition;
- improving the reliability, performance and safety of the rail corridor through appropriate capacity increases to help carry the growing freight task from the Mildura district and the other regions along the corridor;
- dealing with the mix of freight and passenger vehicles especially on two lane sections of the Calder Highway and other roads in the corridor so that safety outcomes improve;
- providing safe access to and from local roads and properties abutting the corridor;
- enhancing safety at level crossings appropriate to projections of road and rail traffic;
- responding to fatigue related safety concerns;
- improving the condition of the Melbourne–Mildura rail link and throughput of silos and terminals to reduce transit times and improve reliability;
- ensuring road pavements and surfaces are in good condition;
- improving the safety and condition of roads that link with the Calder and Sunraysia Highways;
- dealing with capacity concerns that give rise to travel speed and safety issues;
- dealing with safety, amenity and capacity issues at towns and cities along the route in particular on Bendigo's main arterial roads due to growth areas and rising traffic; and
- planning long-term strategic land use to ensure that land reservations exist for future links.

Chapter 5

STRATEGIC RESPONSE

STRATEGIC PRIORITIES

The strategic priorities are a response to objectives for the AusLink Network and the challenges facing the Melbourne–Mildura Corridor. They are measures that are of national importance, are consistent with the corridor objectives and need the most urgent attention. The corridor priorities provide specific guidance to investment priorities and framing of projects for the corridor as a whole or a specific link.

The strategic priorities for the Melbourne–Mildura Corridor are in two groups:

- short-term (to 2015) – corresponding to the priorities for the next National Land Transport Plan and associated investment programme; and
- longer-term (from 2015) priorities.

Short-Term Priorities

The short-term priorities for the Melbourne–MIldura Corridor and how they relate to the AusLink Network objectives are shown in Table 7. These priorities centre around five strategic issues in Table 6. These strategic responses give rise to a range of short and longer-term priorities. In the short-term, the focus on the road corridor will be to ensure that road capacity and design underpin travel efficiency and safety throughout the corridor. For the rail corridor, the short-term focus is on upgrading of the track, and provision of more and longer passing loops, to enable trains to travel faster and more reliably, and to enable the use of longer trains.

TABLE 6 Strategic Issues

Strategic Issues	Responses
Improving the capacity and efficiency of the rail corridor.	Investments on the Mildura–Gheringhap rail line to improve its throughput and ensure that it remains a viable transport alternative to road.
Providing sufficient road capacity and future connections to deal efficiently with the growing and differing freight and passenger tasks along the length of the Calder Highway.	Ensure that the Calder has sufficient capacity to carry the significant and growing traffic flows in the far north and on the Melbourne—Bendigo segment (including within the City of Bendigo), and through and local traffic in the Mallee and Wimmera. Ensure that future connections along and at the ends of the corridor are protected and reserved to cater for future demand.
Maximising safety of passenger and freight movements on the road corridor.	Ensure that the growing mix of freight and passenger traffic does not compromise safety. Address fatigue related safety issues, by ensuring adequate rest areas along the road corridor and other measures. Improve safety at road/rail level crossings. Ensure appropriate access management to provide vehicles with safe and efficient travel through sections where traffic volumes are high.
Ensuring continued access to the Melbourne–Mildura Corridor from key state and local roads.	Enhance key road links to ensure they can carry a mix of heavy vehicles and cars to freight facilities and towns along the rail and road corridor.
Managing road traffic issues (safety, amenity, capacity) at towns along the corridor.	Ensure road and rail vehicles can travel safely and efficiently through or around towns. Manage the impacts on community amenity at towns along the corridor. Review the requirement for possible town bypasses and re-design of some level crossings.

TABLE 7 Summary of Short-Term Strategic Priorities

SHORT-TERM Priorities (to 2015)	Capacity	Efficiency	Productivity	Reliability	Safety	Security	Sustainability
Upgrade rail track condition, alignment and number and length of passing loops to improve rail reliability, efficiency and productivity.	●	●	●	●	●	●	●
Improve safety of at-grade road/rail crossings.		○		○	●		
Manage fatigue related safety issues, such as improving the number and facilities of rest areas on the Calder and other highways.				○	●		
Improve safety and capacity of two lane sections of road including overtaking lanes and duplication (particularly north of Bendigo).	●	●	●	●	●		○
Address safety concerns associated with vertical alignment and sight distance along the undulating section of Calder Highway between Red Cliffs and Ouyen by providing more passing opportunities.		●	●	●	●		○
Manage mixed traffic conditions and general traffic growth at higher trafficked points.	●	●	●	●	●		
Manage local access intersections and improvement of access roads, particularly in highly trafficked areas.	●	●	●	●	●		○
Continue duplication of the highway between Red Cliffs and the Sturt Highway (near Mildura) as safety considerations, traffic volumes and economic benefits warrant.	●	●	●	●	●		○
Maintenance and rehabilitation of bridges on the Calder and other highways.	●	●	●	●	●		○
Maintenance and rehabilitation of ageing road sections, including improvement to shoulder seals, widths and road pavements.	●	●	●	●	●		○
Manage road traffic issues (safety, amenity, capacity) at towns along the corridor.	●	●	●	●	●		○
Provide additional capacity and improve safety by providing freeway interchanges and access restoration and additional lanes where traffic volumes are high.	●	●	●	●	●		○
Improve access management on duplicated and unduplicated sections of the corridor to improve road safety, efficiency of traffic flow and ensure that the duplicated sections of the road operate at full freeway standard.	●	●	○	○	●		○
Reserve land for future road and rail links, town bypasses, re-alignment and duplication, where appropriate.	●	●	●	●	●		○

● Direct linkage with objective ○ Indirect linkage with objective

Longer-Term Priorities

As works on the Calder Alternative and rail track upgrade are progressed, the focus will be on improving the safety, productivity and efficiency of the road and rail lines. The longer-term priorities are summarised in Table 8.

TABLE 8 Summary of Longer-Term Strategic Priorities

LONGER-TERM Priorities (from 2015)	Addressing road design requirements to deal with the issues arising from traffic growth, mixed traffic, seasonal influxes, noise and amenity at higher trafficked points along the corridor. Continuing improvement of seal widths and provision of passing opportunities given the mix of heavy vehicles and tourist traffic. Continuing to investigate capacity improvements on the rail and road corridor. Managing use of higher productivity vehicles for both road and rail. Rail asset maintenance to ensure enhanced capacity, speed and reliability resulting from the upgrade is sustained. Continuing to implement improvements to the rail corridor in terms of capacity and transit times to ensure it remains a viable transport alternative to road. Continuing to work on the safety of level crossings. Continue to upgrade the condition of the roads that access the Calder Highway and the rail system and to ensure the safety of their connections with the major highways. Resolving issues concerning the movement of heavy freight vehicles through Mildura, including consideration of an alternative route to the Sturt Highway.

NEXT STEPS

Once the Corridor Strategies are complete they will be provided to the Council of Australian Governments (COAG), which has sought them by 30 June 2007. The Strategic Priorities identified in each of the Strategies will provide a basis for the Australian and State/Territory Governments to negotiate project funding priorities for future infrastructure development on the AusLink Network.

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Australian Government

Australian Government Department of
Infrastructure, Transport, Regional
Development and Local Government

GPO Box 594, Canberra ACT 2601

www.infrastructure.gov.au

Department of Infrastructure
GPO Box 2797, Melbourne Vic 3001
www.doi.vic.gov.au

VicRoads
60 Denmark St, Kew Vic 3101
www.vicroads.vic.gov.au