



Mildura Transport Plan for Long Term Regional Development

| Report Commissioned by Mildura Airport Management
Advisory Committee with the support of The Sunraysia
Mallee Economic Development Board |

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1. Communiqué

Mildura is one of Australia's fastest growing regional cities and it commands a pivotal hub position near the intersection of three state boundaries. Development of the Mildura and Wentworth regions has been constrained by the restrictive nature of both rail and road connections to and around Mildura.

This report was commissioned by the Mildura Rural City Council to provide a broad economic feasibility and cost benefit study following the outline given in the Mildura Transport Strategy Paper of August 2004.

The Rural City of Mildura has recently completed a major Planning Scheme Amendment, C28, which will facilitate the long-term development of the city and surrounding region. This amendment opens the door to the creation of a major intermodal freight gate and industrial park at Thurla which would then permit the relocation of freight operations and fuel depots which are currently serviced by the rail line through the central city.

Removal of the rail line from the central city would have significant economic, environmental and social advantages. It would also allow the full implementation of the Mildura Riverfront Masterplan by opening up the city to the river.

Rerouting of the Sturt Highway around the city on a reconfigured Meridian Road, with a new bridge over the Murray River near Monak, would provide further benefits and a direct road connection to Thurla without transit via the city.

A northern rail connection from Yelta to the transcontinental line at Sayers Lake would open up new combinations of freight paths, particularly important in view of current mineral sands mining by both BeMaX and Iluka.

Table 1 below summarises the results of the economic assessment, taken over a 20-year period.

Table 1 Economic Assessment Results

| | Discounted costs | Discounted benefits | NPV | EIRR | BCR |
|--|------------------|---------------------|---------|--------|------|
| Rail relocation | \$70.3M | \$2.2B | \$2.1B | 145.9% | 31.3 |
| Rail link to transcontinental line | \$219.3M | \$241.1M | \$21.8M | 7.6% | 1.1 |
| Sturt Highway deviation | \$104.7M | \$110.9M | \$6.2M | 7.6% | 1.1 |
| Thurla intermodal terminal & industrial park | \$38.9M | \$51.1M | \$12.1M | 12.7% | 1.3 |

2. Rail

2.1 Present Situation

The existing rail line to Merebin was first constructed in the 1900's and then extended through to Yelta during the 1920's. The official opening of Mildura Station was conducted on 13 November 1903. During the 1920's a rail line was constructed out to Meringur, connecting to the Yelta line near Red Cliffs. These tracks were both Broad Gauge.

The rail line out to Meringur was decommissioned during the 1980's although much of the rail reserve still exists today with a small length of track to a notional Thurla "station". In 1993 passenger services to Mildura were discontinued and replaced by road coaches.

Presently, there are approximately (on average) one inbound and one outbound freight train operating on the Yelta line each day, excluding shunting movements within Mildura. These train movements affect a significant number of level crossings - 22 - located within the City.

As a strategic corridor of the National Rail Network (AusLink), there have long been plans to standardise the rail line from Ballarat to Mildura. However, this was stalled due to ongoing discussions with Freight Australia (Rail America), who were the leaseholders of Victoria's rail freight network. Freight Australia was sold to Pacific National in 2004 and since that time a new arrangement is close to being reached to move forward with the upgrading - if not the standardisation - of the rail line to Mildura. **Figure 1** below shows the extent of the proposed gauge standardisation in Victoria.

Figure 1 Heavy Rail Network in Victoria Showing Proposed Network Changes for Standardisation



This report documents the unique opportunity that is available to combine the upgrading/standardisation project with the provision of an improved rail link around Mildura.

2.2 Safety of the Community - Removal of the Rail from the City Centre

The North West Freight Transport Strategy briefly discussed the issue of transport safety with respect to the alignment of the rail line through Mildura. The Strategy acknowledged that there was a significant number of level crossings due to the alignment of the road network and rail line. However the Strategy indicated that "...low exposure of both road and rail traffic reduce risks." In addition, the Strategy indicated that the accident record "...does not suggest a substantial safety problem is demonstrated nor is delay a serious issue at this time." The Strategy suggested that Council and VicRoads regularly monitor rail crossing risks, particularly related to shunting operations. It is understood that shunting activities can lead to long delays at crossings within Mildura.

An important document released in the year 2000 was a report from the State Coroner's Office, "Accidents at Railway Crossings: - A Coroner's Viewpoint". This document contained an important point - accidents between motor vehicles and trains at level crossings were rare, but when they did occur, there was a relatively high risk of mortality (death). It is well known that the cost to the community arising from road accidents is considerable, socially and financially and that this is especially so when the accident results in a fatality.

The Coroner's Report included findings from two level crossing accidents that occurred in the Mildura region – one at Karadoc Road in Irymple in 1989 and one at Wilga Road in Red Cliffs in 1989. The drivers of the motor vehicles involved in these two accidents were killed as a result of the collisions with the passing trains.

The Coroner's Report recommended that improved warning was required at level crossings to improve the safety of the road environment within the vicinity of rail level crossings but it is clear that greater improvements in safety can be gained by relocating the rail freight services from central Mildura. The Coroner's Report illustrated the high human and community consequences associated with accidents on rail level crossings between motor vehicles and trains.

The relocation of rail freight services away from central Mildura, is considered important to:

- >> Reduce road safety risks, given the shunting movements and expected increase in freight and road traffic over time;

- >> Improve residential and educational precinct amenity and potentially increase the surrounding land value as a result. The relocation of rail freight activities would facilitate relocation of some of the less desirable land uses associated with freight activity away from residential area (eg the fuel depots); and
- >> Reduce the delays and associated costs to road-based transport.

The relocation of rail freight services would also support the proposed industrial developments located to the south of Mildura, such as at Thurla, therefore streamlining freight operations throughout the area.

2.3 Freight Imperatives

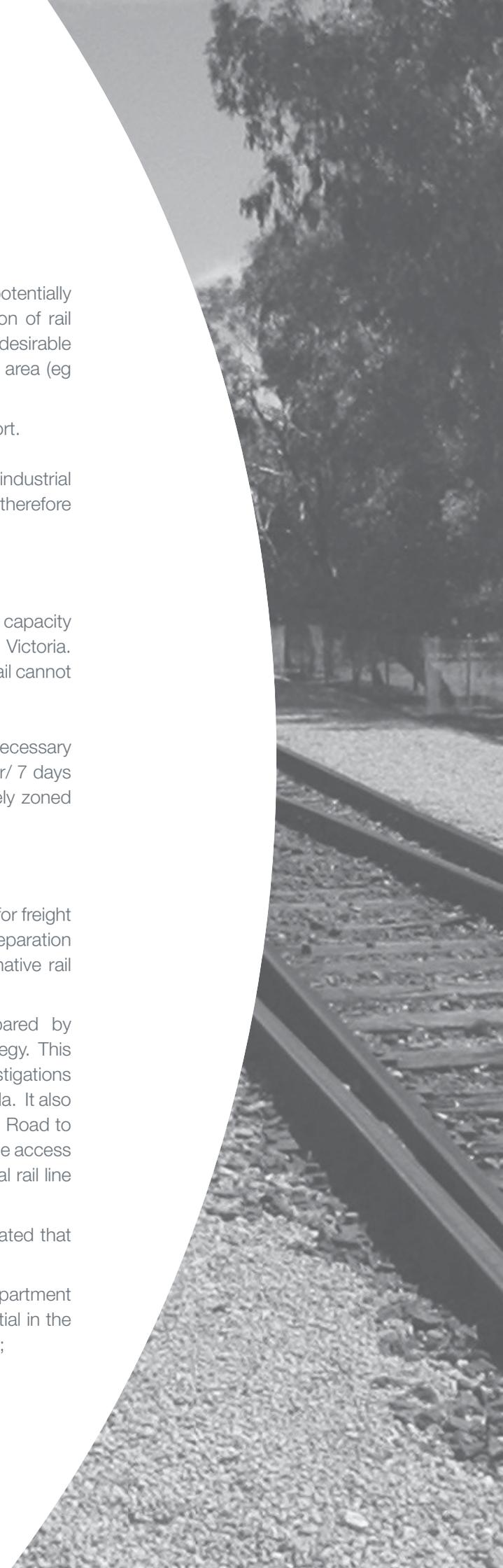
The existing intermodal terminal at Merbein is now operating at close to capacity and was never intended to be a major freight gate for north west Victoria. Increasing demand for freight interchange whether road/road or road/rail cannot be accommodated indefinitely at Merbein.

In order to permit the orderly development of industry and the necessary transport provisions it will be essential to move to a dedicated 24 hour/ 7 days a week freight gate, clear of built-up areas and within an appropriately zoned and located area within the Rural City of Mildura - ie at Thurla.

2.4 The Rail Loop around Mildura

The construction of an alternative rail loop around Mildura, particularly for freight traffic, has been raised in a number of the documents reviewed in the preparation of this report. Some key items from those reports, relating to alternative rail connections, included:

- >> The Mildura Industrial Land Implementation Strategy, prepared by Maunsell (2004), referred to the Mildura Industrial Land Use Strategy. This document recommended that Council undertake further investigations regarding the possible reinstatement of the Morkalla Line to Thurla. It also discussed the opportunity for further extensions along Meridian Road to Abbotsford Bridge to the north west of Merbein in order to provide access to the New South Wales markets and the to the transcontinental rail line passing through Broken Hill;
- >> The Mildura Industrial Land Implementation Strategy also indicated that the Mildura Freight Gate should be relocated to Thurla;
- >> The North West Freight Transport Strategy, prepared by the Department of Infrastructure (2002), indicated that the Mineral Sands potential in the area could be supported by re-establishing a spur line to Thurla;



- >> The North West Freight Transport Strategy indicated that previous studies were reviewed regarding the relocation of the rail line out of central Mildura, which was then ruled out as an option. No information giving reasons for supporting this recommendation was provided; and
- >> The North West Freight Transport Strategy indicated that an option for consideration was the re-establishment of a rail line from Red Cliffs to Thurla, utilising the existing Morkalla Rail Line reservation in order to support Mineral Sands development and the Deakin Project.

Following a review of the previous work undertaken and considering recent developments with respect to Thurla, the construction of a rail loop around Mildura, particularly for freight traffic, is strongly supported and recommended. The rail line could be constructed in stages, initially as a spur line to Thurla, but over time extending through to Yelta and providing the opportunity for a connection to the Transcontinental Rail Line. It is clear that previous studies indicated that the development of a rail loop was important, but this was curiously refuted in the 2002 North West Freight Transport Strategy. The more recent 2004 report prepared by Maunsell indicated that this loop should be considered.

2.5 Passenger Services

The Victorian State Government is committed to restoring passenger services to Mildura. This is compatible with the removal of rail from the centre of Mildura and fits comfortably within the proposed staging strategy by the establishment of an interim passenger terminal station at Irymple. Railway land is available at Irymple and it is a convenient location for a bus and taxi hub to service Mildura and suburbs.

2.6 Economic Assessment

2.6.1 Economic Methodology

The approach, which has been adopted for the economic viability of all three rail investment proposals/options, namely:

- >> The removal of the rail line from the city centre;
- >> The new rail loop around Mildura and the development of a new intermodal facility at Thurla, south of Mildura; and
- >> A standard gauge connection, north of Mildura, to cross the Murray, and to reach the standard gauge transcontinental line at Sayers Lake thus providing access to Broken Hill, Perth, Darwin and Sydney without backtracking;

has been to complete a stand-alone individual economic assessment of the proposed investments. A conventional discounted cash flow (DCF) analysis over an assumed minimum of 20 years has required the estimation of a range of costs and benefits. All cost and benefit estimates have been prepared in 2005 constant prices, to avoid forecasting inflationary effects.

The analytic procedures are consistent with the Victorian Department of Infrastructure Investment Guidelines and the AusLink Investment Guidelines of DOTARS.

A range of investment criteria, including economic internal rates of return (EIRRs), benefit-cost ratios (BCRs) and net present value (NPV), have been estimated. Minimum cut-off levels (or minimum economic viability) have been assumed to be EIRRs > 6.5%, and BCRs of > 1.

Each of the four economic appraisals has their own unique benefit streams, which have been estimated from Mildura-based and transport sector-specific data sources. The individual results are to be interpreted at the pre-feasibility study stage only as both cost and benefit estimates are $\pm 20\%$. Further refinement of both costs and benefits is expected, as is conventional practice, for public sector investment proposals of this nature.

2.6.2 Economic Analysis Findings

Removal of the Rail from the City Centre

Table 1 in Appendix A provides details of the economic benefits and costs associated with the removal of the rail line and existing station in the City's centre. The range of economic, social and environmental benefits to be expected is significant and wide-ranging. A major component of the economic benefits is related to the removal of 20 level crossings, which would yield major time and vehicle operating cost savings, for both the trucking industry and private motorists. Only freight-related benefits have been quantified. Benefits to Mildura and regional motorists could be of considerable scope. However, these impacts have not been included (as an economic development approach warrants a freight only perspective).

The following benefits were quantified and monetised:

- >> Economic/financial opportunities from making available a major strategic real estate 'parcel' in the CBD, approximately 800 metres x 60 metres, for new commercial/tourism-related activities. Additional real estate will be available south of the City and to the west through to Merbein, as the level crossings and rail alignments are made available for alternative use;
- >> Savings in the time costs (labour and fleet utilization) from the commercial freight movements by road at each of the 20 level crossings;
- >> Savings in idling time (fuel cost reduction) at the eliminated level crossings;
- >> Opportunities for new, induced employment in commercial/tourism-related jobs (these will be new jobs, not transfers from existing employment);

- >> Increased visitor and tourism expenditures, both as day visits to the new open space areas adjacent to the Murray River but additional visitor-nights, from interstate, Victorian and international tourists; and
- >> Community-based benefits from participatory enjoyment of the open space areas, made available with the relocation (this has been estimated by assuming the willingness-to-pay [WTP] of enjoyment, as based on the minimum cost of access by car to the area).

The economic results of the DCF analysis indicates that significant benefits are to be generated by relocating the rail line, largely due to the high benefits from the removal of the 20 level crossings. An overall EIRR of 146% was estimated; a BCR of 31.3 and a huge NPV, greater than \$2 billion. This result is very high by Victorian and Australian experience. However, as large as it is, it is a conservative estimate (no private motorist benefits are included). Safety gains from relocating fuel depots away from schools have not been quantified. Further investment stimulus along the river foreshore has also not been quantified.

It is clear that the relocation of the City rail line is a high priority for Mildura, and for the region. Similar successful economic, social and environmental rail relocation examples can be identified in Australia. These include:

- >> Cairns – in North Queensland - the relocation of the old sugar trains to the wharf, leading to tourism expansion in the 1980's;
- >> Albany – in southern Western Australia - the relocation of rail line/grain handling loops, has led to new open space areas for tourism and 'whale watching' opportunities; and
- >> Newcastle – the planned removal of the old train station and the rail line from the City has already led to a major real estate 'boom' for nearby apartments. By the end of 2006, the City of Newcastle will have a major foreshore redevelopment, to be enjoyed by more than 500,000 residents.

An issue for the project is the timely completion of the new Thurla intermodal facility to allow the current facilities at Merbein and Yelta to be relocated. This will provide additional future tourism/community development of the old rail line and an easement for exciting new viticulture/agri-tourism activities in the grape/dried fruit/ wine areas to the west of Mildura City.

Northern Connection to the Transcontinental Railway

This project concept is at an embryonic stage. The level of economic costs and benefits are less robust than for the Mildura City centre project. However, it has been widely recognized in Mildura that a northern access, by means of a new northern standard gauge line from Mildura to Broken Hill, could yield significant benefits for Mildura, the Riverland region and more broadly for Victoria.

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Table 2 in Appendix A summarises the results of the pre-feasibility study conducted, with very limited future rail network benefit estimation. A more detailed demand study is required to estimate the likely gains in detail from rail transport, on standard gauge, from Melbourne to Mildura to Broken Hill to Sydney or to Perth or to Darwin but this early evaluation indicates that the project is economically justified.

- >> An EIRR of 7.62%, above the assumed hurdle rate of 6.5%
- >> An NPV of \$22 million; and
- >> A BCR of 1.1

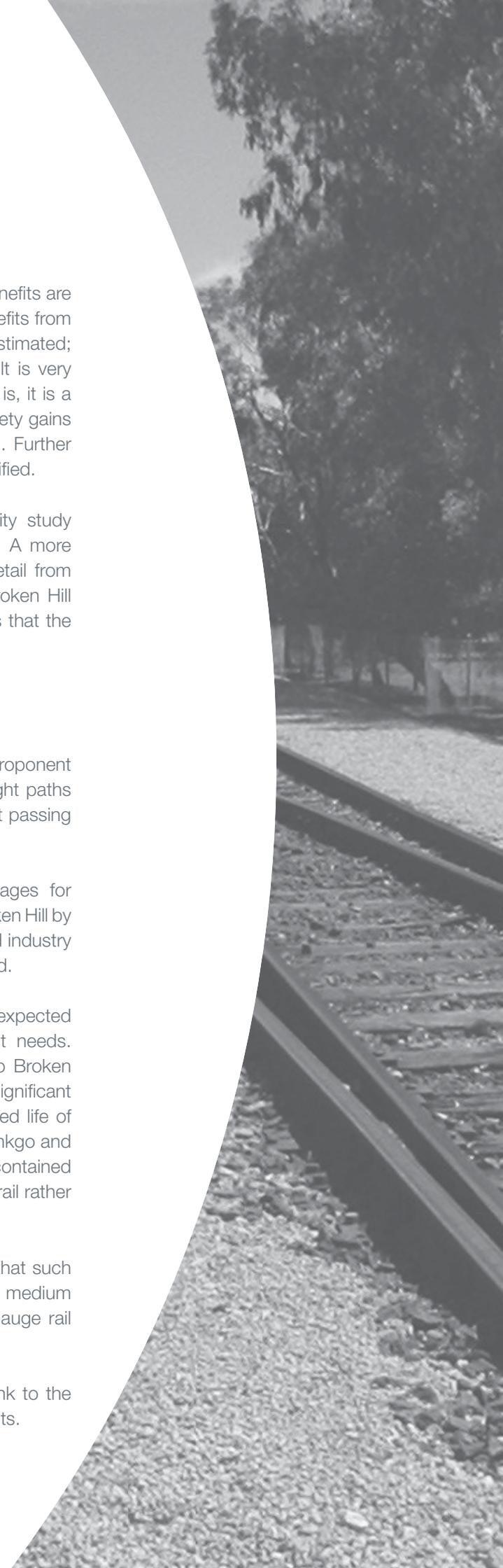
Freightlink, the Adelaide to Darwin rail operator, is an enthusiastic proponent of the northern connection as it opens up new combinations of freight paths in all directions, allowing Melbourne to Perth and Darwin runs without passing through the Adelaide Hills.

Tourism opportunities associated with 'outback experience' packages for Australian and international visitors, linking Melbourne/Mildura and Broken Hill by special rail tours, have been already identified by tour wholesalers and industry specialists. These themes need to be further explored and researched.

The current expansion of mineral sand deposits in the Mildura region is expected to continue to 'drive' road and rail haulage tasks and investment needs. Currently, BeMaX mineral sands are planned to be trucked north to Broken Hill, in the absence of a rail line. Published forecast tonnages are significant (ranging from 500,000 to 1,000,000 tonnes per year) with a projected life of 14 years for the Ginkgo mine alone. BeMaX has reported that the Ginkgo and Snapper mines have combined resources of 12 million tonnes of contained Heavy Minerals. Future economic savings on a per tonne basis from rail rather than road haulage could be expected, if a rail link was available.

The results of the economic analysis should be interpreted broadly; that such a proposed standard gauge link has significant strategic benefit in the medium and long term, in the context of a more comprehensive standard gauge rail network for Australia.

Appendix B gives three maps showing the proposed route of the link to the transcontinental line and its proximity to the mineral sand developments.



There are a number of important roads within and surrounding the city of Mildura, serving the local community, which include the National Highways discussed above. These key links include:

- >> Deakin Avenue (Sturt Highway) is the major north-south link within Mildura and is the major retail/commercial precinct. Deakin Avenue carried approximately 7,000 vehicles per day² ;
- >> Benetook Avenue, an important north-south connection, located in the southeast of Mildura; and
- >> Fifteenth Street (Calder Highway) and Seventeenth Street (Calder Highway), which are major east-west links through the city. Seventeenth Street, southeast of Deakin Avenue in 2001 carried approximately 1200 vehicles per day and 3,300 vehicles per day northwest of Deakin Avenue³, which gives an indication of the importance of the Calder Highway (Seventeenth Street southeast of Deakin Avenue is not part of the Calder Highway).

3.1.2 Road-Based Freight Traffic

The North West Freight Transport Strategy, prepared by the Department of Infrastructure (2002), provided data relating to the existing average daily truck volumes in the area. The average truck volumes per day for existing and the estimation of future freight conditions reported in the Strategy are shown in Table 2.

The volumes presented in Table 2 indicate a substantial increase in volumes, particularly in Deakin Avenue³ (Sturt Highway, central Mildura), which is estimated to experience a growth of approximately 50 per cent over the next 20 years.

Table 2 Truck Volumes (Average per Day)

| Location | Existing (2002) | Short Term (+5 yrs) | Long term (+20 yrs) ⁴ |
|---|-----------------|---------------------|----------------------------------|
| Calder Highway, west of the Sturt Highway | 460 | 550 | 620 |
| Sturt Highway (central Mildura) | 910 | 1050 | 1370 |
| Sturt Highway, east of Chaffey Bridge | 1300 | 1520 | 1800 |
| Calder Highway, south of Red Cliffs | 165 | 180 | 270 |

² Source: Rural City of Mildura (2001), documented in Deakin Avenue Service Station – Traffic Impact Assessment

³ Source: Rural City of Mildura (2001), documented in Deakin Avenue Service Station – Traffic Impact Assessment

⁴ Assumes without Swan Hill Freight Intermodal Terminal

This estimated increase in truck volumes is undesirable within an environment that caters for local traffic movements, land access and pedestrian traffic, all associated with the commercial/retail activities in the heart of Mildura. Indeed, for reasons of safety and public amenity this is likely to be unacceptable to the local community. This estimated increase would lead to a significantly decreased level of amenity in the area, with increased pollution (air, noise) and congestion as well as increased road safety risks associated with the higher traffic volumes.

The increased numbers of trucks is being accompanied by ever-increasing pressures to raise the mass of loads carried by trucks for better efficiency. These increased loads place greater pressure on the existing infrastructure, which can potentially lead to a more rapid deterioration of the road pavement, and impacting in turn on private vehicle use and the amenity of those areas. This is particularly the case for Mineral Sands and the likelihood that some local roads (eg Meridian Road) would be subjected to increasing heavy vehicle volumes over time.

The existing journey undertaken by trucks is also undesirable for the operation of the trucks themselves. Long-haul trips through busy town centres, such as Mildura, present a number of distinct disadvantages for trucks:

- >> Increased fuel use, increased tyre wear and general wear and tear on the trucks due to acceleration and deceleration through town as trucks are required to stop and start at busy intersections;
- >> Increased travel time due to the congestion, which results in increased costs to operators, which in turn are often passed on to the end customer;
- >> Increased safety risks to equipment and freight, due to the significant numbers of conflict points throughout the journey; and
- >> Increased driver stress, particularly in busy retail areas such as Deakin Avenue, where private vehicles can perform unexpected and often dangerous manoeuvres, requiring truck drivers to take evasive action.

The Rural City of Mildura has campaigned for many years (including prior to amalgamation in 1995) for an alternative alignment of the Sturt Highway to remove the need for through truck movements from Deakin Avenue, with Benetook Avenue previously favoured by Council.

3.1.3 Freight Terminals - Road

There are a number of freight terminals within or near Mildura that are serviced by road-based freight transport. These terminals are the origin and/or destination of some of the road-based freight traffic that moves on the road system within central Mildura.

The key sites include:

- >> Merebin – a major rail/road freight terminal is located at Merebin, situated on the Calder Highway to the west of Mildura. There is considerable truck activity associated with this facility;
- >> Petroleum distribution – three of the petroleum distribution facilities within Mildura receive petroleum from South Australia via road⁵; and
- >> General Cargo – located at the Mildura General Freight Services operation, road-based access is available for trucks off Seventh Street. These vehicles generally service the local market⁶.

The location of these freight terminals is significant, attracting undesirable truck movements and creating a proportion of the adverse impacts within central Mildura discussed above, in addition to the through-truck traffic travelling beyond the region.

The locations of these freight centres have the potential to be put to a use that would provide greater amenity to the surrounding community, enhancing the overall quality of life in the area, particularly given that viable alternatives have been identified. The relocation of those facilities would facilitate an upgrade of the transport system to better support more environmentally friendly and socially acceptable land uses.

3.2 Road Safety

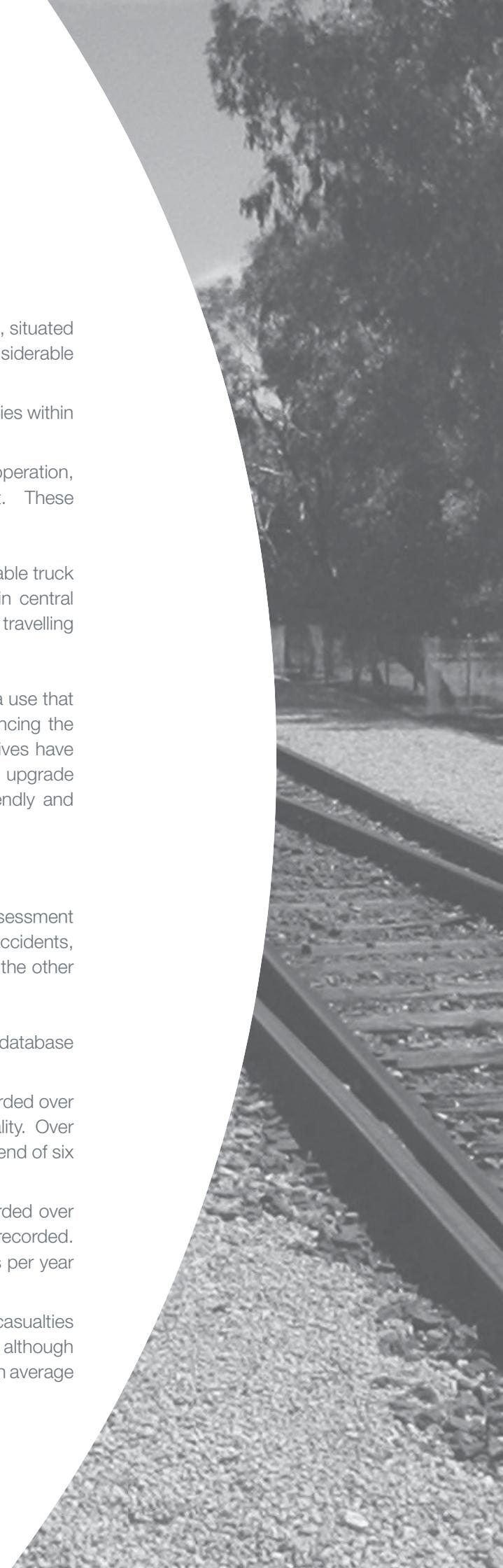
The safety of the local community is of paramount importance. An assessment of the accident history, over the last five years of recorded casualty accidents, has been undertaken for the Sturt Highway, the Calder Highway and the other Declared Roads within Mildura.

The key findings from the review of the VicRoads accident casualty database to June 2004 included:

- >> For the Calder Highway, a total of 32 casualties have been recorded over the last five years from 21 accidents. This has included one fatality. Over the last three years of available data, there has been a steady trend of six casualties per year (average) resulting from accidents;
- >> On the Sturt Highway, a total of 70 casualties have been recorded over the last five years from 63 accidents, although no fatalities were recorded. The last three years has witnessed an average of 15 casualties per year resulting from accidents; and
- >> On the remaining Declared Roads within Mildura, a total of 45 casualties have been recorded over the last five years from 33 accidents, although no fatalities were recorded. The last three years has witnessed an average of 10 casualties per year resulting from accidents.

⁵ Source: North West Freight Strategy – Department of Infrastructure (2002)

⁶ Source: North West Freight Strategy – Department of Infrastructure (2002)



The above information indicates that over the last three years, an average of 31 casualties have occurred each year on the major roads within Mildura, a significant number in this rural city.

For the Rural City of Mildura overall, the VicRoads database reveals that there have been 15 fatal accidents over the last five years.

3.3 Alternative Sturt Highway Route around Mildura

3.3.1 Review of Previous Studies

The preceding discussion has documented the existing situation with respect to the road network within and around Mildura. The proposal for a realignment of the Sturt Highway has been on the agenda for a number of years, with Council having favoured Benetook Avenue in the past as a suitable alternative route for this component of the AusLink National Network. Road traffic signs have recently been installed within Mildura to guide truck traffic away from Deakin Avenue, however this is not considered a sufficient long-term strategy. A number of past studies have been undertaken that have considered the relocation of the Sturt Highway and/or freight activities.

The studies reviewed for this report included:

- >> North West Freight Transport Strategy (2002) – Department of Infrastructure;
- >> Mildura Freight Operations Relocation and Redevelopment Study (1995) – Connell Wagner;
- >> Mildura Industrial Land Implementation Strategy – Development Cost Report (2004) – Maunsell; and
- >> Mildura Transport Strategy Paper (2004) – Riverside Infrastructure Services.

The North West Freight Transport Strategy (NWFTS) documented additional infrastructure that would require upgrade to support increased heavy vehicle volumes, which included:

- >> Abbotsford Bridge;
- >> Meridian Road (into a two-lane road capable of supporting heavy freight vehicles);
- >> Development of a road network supporting the Deakin Project, including Red-Cliffs-Meringur Road; and
- >> The Chaffey Bridge, likely to require duplication by approximately 2012.

The Mildura Industrial Land Implementation Strategy (MILIS) proposed several key upgrades to road infrastructure, particularly to support the Thurla industrial area. MILIS referred to Thurla as having been identified as a key strategic location for freight-based activities, which is consistent with the direction of this current report.

The key road-based infrastructure upgrades identified in the MILIS included:

- >> Red Cliffs-Meringur Road;
- >> Meridian Road, which was noted as part of a future strategic outer bypass of Mildura; and
- >> Benetook Avenue, which was identified as the southern extremity of a freight route for Thurla.

The Mildura Transport Strategy Paper (MTSP) was a brief high-level document that outlined a number of key actions for the future of the transport system in and around Mildura, for both road and rail.

The key items within the MTSP:

- >> Considered that Benetook Avenue was not the optimum long-term solution as an alternative route for the Sturt Highway;
- >> Presented two key components for the road elements that formed the strategy:
 - Re-align the Sturt Highway between Monak and South Merebin, utilising the existing road alignments of Wilga Road and Meridian Road; and
 - Re-align the Calder Highway, to follow the Sturt Highway realignment between Red Cliffs and Merebin South and then extending this new alignment through to Yelta.

The proposed re-alignments of the two highways would be supported by the proposed re-alignment of the rail line, both of which could service the new industrial subdivision at Thurla, providing a strong example of integrating land use planning with transport planning - a key theme in AusLink.



3.3.2 Recommended Strategy

The strategy outlined within the MTSP is **strongly supported** as an appropriate long-term structure for the highway system within and around Mildura. It is recommended that:

- >> The Sturt Highway should be re-aligned along the approximate existing alignment of Wilga Road (from Monak), through to Meridian Road and then north along Meridian Road to the current location of the Sturt Highway. This alignment would provide significant benefits:
 - An effective bypass of the town centre for the Sturt Highway. This would remove the need for regional truck movements to pass through Deakin Avenue, resulting in reduced congestion, reduced accident risks, environmental improvements and enhanced amenity for residents. In addition, operating costs for trucks could be expected to be reduced with fewer interruptions to the journey;
 - A direct connection to the proposed major industrial development at Thurla. This direct connection to the terminal would have economic advantages and can be combined with rail freight for a true, regional intermodal terminal; and
 - Reduced costs associated with infrastructure deterioration due to truck usage within the town centre.
- >> The Calder Highway should be realigned with the Sturt Highway and extended through to Yelta along the existing Meridian Road alignment. This would support the benefits documented above for the realignment of the Sturt Highway

Key features of the new highways should include:

- >> Each should be constructed to 'A standard', in accordance with the VicRoads classification system for arterial roads in the network. The required standards for an 'A standard' road are outlined in the Linking Victoria document released by VicRoads;
- >> Two interchanges will need to be constructed at the two junctions of the Highways. No formal design has been prepared at this stage. Construction of grade-separated interchanges would provide quick, direct connections to the proposed freight terminal and/or facilitate quicker regional trips around Mildura;
- >> The Sturt Highway should be grade separated from the rail line and the Calder Highway, commensurate with the current policy of creating no new level crossings within Victoria; and
- >> The re-alignment of the Sturt Highway will require the creation of a new river crossing near Monak. The creation of this new river crossing is discussed in more detail on following page.

The re-alignment of these Highways can be undertaken in stages, which is discussed in **Section 8** of this report.

It is considered that the re-alignment of the National Network described above would provide better infrastructure support over the long term than using Benetook Avenue, as it would assist in the development of residential, commercial and retail land use within Mildura, separated from amenity-adverse freight activities. Heavy vehicles would experience fewer delays utilising the recommended Bypass. In addition, the proposed bypass could provide a more direct link to the Thurla Industrial site.

Benetook Avenue should remain as an important link within the local road network of Mildura, servicing growing residential and commercial areas, however its role as a long term link in the National Network is not supported, with the Wilga Road option considered more suitable.

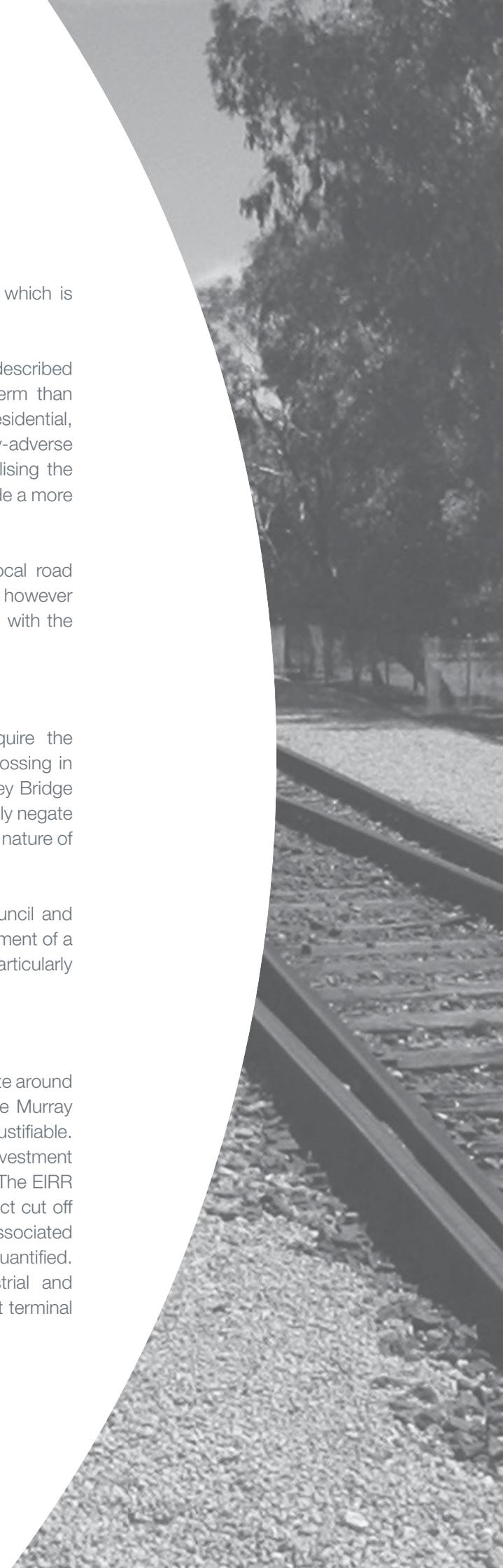
3.4 New Bridge Across the Murray River

The recommended realignment of the Sturt Highway would require the construction of a new river crossing near Monak. This third river crossing in the Mildura region would take pressure off the existing George Chaffey Bridge within the heart of Mildura and is likely to significantly delay or potentially negate the need to duplicate the George Chaffey Bridge, depending upon the nature of the crossing constructed at Monak.

Since 2004, closer cooperation between the Mildura Rural City Council and Wentworth Shire Council has had this new bridge as an important element of a common agenda. The new bridge would also facilitate development, particularly residential development, between Buronga and Monak.

3.5 Economic Assessment

The economic appraisal of the proposed alternative Sturt Highway route around Mildura, a Calder Highway interchange and a new bridge across the Murray indicates that this 'package' of road investments is economically justifiable. The results of the pre-feasibility economic analysis, based on an investment of \$95 million, over 2 years, are presented in Table 2 in Appendix A. The EIRR was estimated at 7.6%, which exceeds the Treasury 'hurdle' or project cut off rate. Additional benefits associated with reduced emissions/noise associated with diversion of trucks from Mildura's urban streets have not been quantified. Similarly, induced economic benefits associated with new industrial and commercial investment in relation to the new Thurla intermodal freight terminal have not been quantified.



The primary economic benefits, which were quantified and monetised, were:

- >> Future savings in additional investment in the existing Chaffey Bridge (investment costs are avoided);
- >> Savings in travel time costs for both motorists and commercial vehicles, with the new routing;
- >> Savings in truck vehicles operating costs (VOCs) with reduced fuel costs, braking and tyres wear;
- >> Reduced levels and costs of minor/major vehicle accidents [reduced fatalities cannot necessarily be assumed], with a reduction in the incidence of crossing accidents at the highway intersections.

The results of the economic analysis of the proposed road/highways investment indicate that the program is economically viable. Additional economic, social and environmental benefits can be expected, associated with increased land transport efficiencies for both private vehicles and commercial truck fleets, moving between NSW, Victoria and South Australia. The potential for AusLink investment should be explored.



4. Mildura Airport

4.1 Present Situation

Mildura Airport is located to the southwest of Mildura, accessed off Nineteenth Street. The airport is one of the busiest regional airports in Australia, carrying well over 150,000 passengers per year and experiencing a steady growth in passenger numbers. The two major airlines that currently service Mildura Airport are Qantas and Regional Express (Rex). O'Connor Airlines from Adelaide - Australia's oldest operating airline - also services Mildura from Adelaide. Mildura is directly connected to a number of major centres throughout the region, including Melbourne, Sydney and Adelaide.

The Airport has in recent years undergone upgrades to both the land and airside. The airfield has been extended and can now cater for aircraft up to the size of a Boeing 737, while the expanded passenger terminal was opened last year, which incorporated new baggage reclaim facilities and improved aprons for aircraft.

The Airport has a number of peripheral activities, including flying schools, aircraft maintenance and a business park, which has been the subject of a Masterplan for future development.

4.2 Policy for Future Development

Council, several years ago, produced the Airport Business Technology Park Master Plan, a strategic planning document. This Plan was produced to facilitate the development of the precinct for aviation, industrial and commercial activities. It is understood that Council is continuing to strive for improvements and expansion of the Business Park associated with the Airport.

The MILIS incorporated a number of elements relating to a Mildura Airport Concept Plan. The boundaries identified for the Airport and the Industrial and Business Park were described as follows:

- >> Sturt Highway (northern boundary);
- >> Walnut Avenue (eastern boundary);
- >> Whitecliffs and Oak Avenue (western boundary); and
- >> Nineteenth Street (southern boundary).

The MILIS discussed in greater detail the specific elements pertaining to the Business Park and the Industrial Park. Heavy vehicle access to be provided via Oak and Whitecliffs Avenue, with a connection to Thurla via Twenty-First Street and Benetook Avenue.



The development of an Industrial Park at the Airport is considered to compliment the larger proposed terminal at Thurla. Direct road access is important between the two and the use of Benetook Avenue is consistent with the position of Benetook Avenue as an important strategic link within Mildura. Freight movements between the two industrial sites is removed from the residential and retail areas of Mildura and incoming traffic could utilise the proposed Bypass and arrive at the Airport from the south.

4.3 Mildura Airport as a Freight and Passenger Terminal

Mildura Airport is predominantly a passenger terminal at present and as documented in the NWFTS, only 'minor freight movements' occur at the Airport. The NWFTS indicated that most of the freight incorporated time sensitive, high-value products delivered on an as-needs basis. There is a small proportion of general freight that is delivered to and from Mildura daily on passenger services, in addition, a large amount of fresh produce is road freighted to Melbourne, ultimately bound for Asian markets. This freight is carried on international passenger flights departing Melbourne.

The NWFTS indicated that there was no strong case for a 'substantial increase' in the use of air freight due to a number of major impediments, including heavy and low-moderate value of goods and the adequacy of existing infrastructure at the Airport to support an economically viable air freight service. In addition, the NWFTS referenced the Mildura Airport Master Plan which indicated that that Plan assessed the existing infrastructure at the Airport as adequate to cater for the expected airfreight and passenger demands over the next fifteen years.

Passenger movements through Mildura Airport could reasonably be expected to continue to grow over time, comprising tourist and business traffic. The major area for growth is in the use of air for transporting freight, particularly high value express freight. An opportunity exists to create an important strategic freight hub, nationally and internationally.

Successful growth of the various industrial and commercial precincts over time (eg Thurla) and continued growth of the existing and planned industries (eg the Deakin Project) would support the increased use of air freight services for long haul trips, particularly to international markets that are currently freighted via Melbourne. This would support the drive by Council to develop the Business and Industrial Park at the Airport with the capability to directly freight to international markets likely to be attractive to potential tenants.

4.4 Rail and Road Access into the Airport

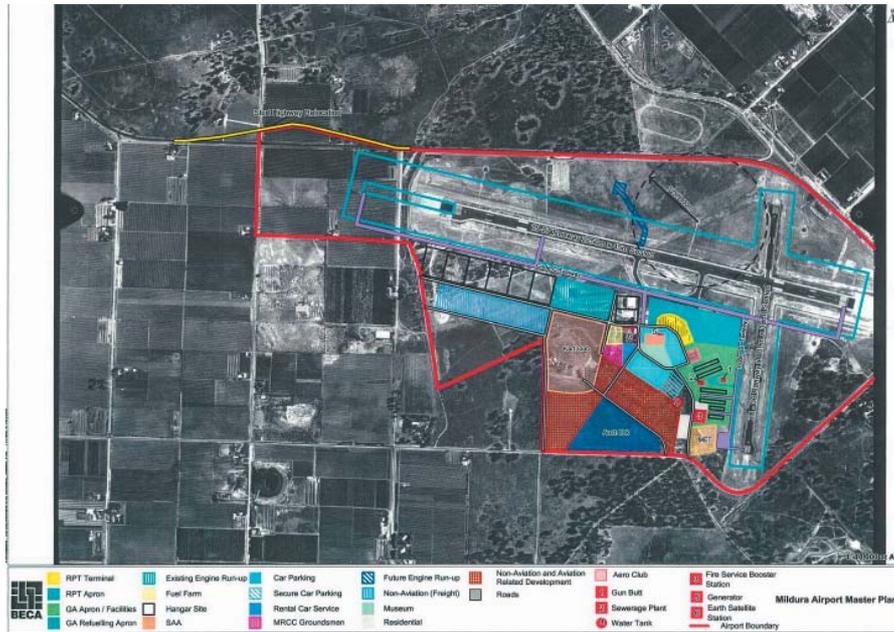
Providing strong supporting ground-based transport infrastructure to the Airport is crucial to the long-term success of the Airport operating as a supporting freight terminal.

This document has outlined the recommended road and rail requirements to support the growth of freight transport at Airport, namely:

- >> The proposed Sturt and Calder Highway realignment through to Thurla. This can provide quick access for trucks to/from the airport, via Thurla and then Benetook Avenue-Whitecliffs Avenue, rather than through central Mildura. In addition, the existing Sturt Highway west of the Airport can be used as a key strategic link for traffic further to the west; and
- >> There is the opportunity to create a rail link to Mildura Airport in the long term, potentially to create an intermodal freight and passenger terminal. This is unlikely to be considered in the short to medium term, but was supported in the Panel Report for Amendment C28 to the Mildura Planning Scheme (discussed in Section 7).

Figure 3 below shows a summary of the current Mildura Airport Master Plan giving the medium to long term projected boundaries for the airport.

Figure 3 Mildura Airport Master Plan



5. Intermodal Freight Terminal at Thurla

5.1 Overview

Thurla is situated to the south of Mildura and is currently the site of the mothballed Murray Basin Titanium (MBT) facility - now owned by BeMaX - and Mawsons Gravel. Thurla has previously been identified as a key strategic location for future freight-related industry and the infrastructure recommendations in this document provide clear support to the development of a thriving industrial development at the site. The provision of quality infrastructure would provide a valuable marketing tool for developers of the land and the reverse is also true – future development at Thurla will command quality land access to ensure its continued success and viability into the future.

The Rural City of Mildura supports the development of Thurla as an industrial terminal and this was recently the subject of a Panel Report, prepared for Amendment C28 to the Mildura Planning Scheme.

5.2 Land Zoning and Ownership

Amendment C28 – Mildura Planning Scheme

A Panel was appointed on 24 August 2004 to hear and consider submissions related to Amendment C28 to the Mildura Planning Scheme. Amendment C28 included the following:

- >> A new Municipal Strategic Statement (MSS), arising from the recommendations of the Three Year Planning Scheme review;
- >> A modified suite of local policies;
- >> The replacement of several maps and schedules to overlays and the inclusion of new overlays; and
- >> Some re-zonings of land around Mildura, which included land at Thurla and 'Block H' (the old Irymple township) to be re-zoned as Industrial 1 Zone (identified in the Mildura Industrial Land Use Strategy).

The Panel Report included the following key points:

- >> Recognised that the Planning Authority (Council) had identified the need for future greenfields sites and other sites to accommodate future industrial development – including Thurla, Block H and Mildura Airport;
- >> Much of the existing land zoned for Industrial uses had limited capacity and the Mildura Industrial Land Use Strategy focused on rezoning large tracts of land at Block H and Thurla;
- >> Benetook Avenue was identified in the Mildura Industrial Land Use Strategy as a possible truck bypass;

- >> A study undertaken by Council recommended that the Planning Authority should have discussions with the Department of Infrastructure and the Department of Sustainability and Environment regarding the possible reinstatement of the Morkalla rail line to Thurla; and
- >> That Thurla could be the potential new location for the Mildura Freight Gate, due to good road access and potential reinstatement of the rail link (connecting through to the airport to the north).

The key recommendations/statements of support made by the Panel, relevant to this report, included:

- >> The land at Thurla be included in an Industrial 1 Zone;
- >> The proposal to zone land to accommodate industries that require larger sites away from sensitive land uses, such as residential, was appropriate; and
- >> The long-term goal of relocating the Mildura Freight Gate to Thurla and connecting it by rail to the airport was a sound planning decision in providing an alternative to road transport in the transport of freight in the region.

The Panel recommended that Amendment C28 be adopted, subject to minor modifications.

5.3 Anchor Tenants

An essential factor in the creation of an intermodal terminal and industrial park at Thurla is the installation of a number of anchor tenants who would act as poles of attraction for other industrial and transport clients.

An example of the importance of the anchor tenant(s) can be seen in the LOGIC Industrial Park development at Wodonga where the Woolworths Distribution Centre is the catalyst for the development of what could become Australia's largest industrial park (600 Hectares) which will include an intermodal freight terminal.

In the case of Thurla, the initial anchor tenants could include the Wakefield company operations relocated from Merbein (with suitable transition and overlap to avoid disruption), the existing on-rail and off-rail fuel depots (Shell and Mobil on-rail plus BP and Caltex off-rail), the GrainCorp operations relocated from Yelta and a number of manufacturing and/or processing and packaging industries.



5.4 Development and Operation of the Terminal

The development of an intermodal terminal/industrial park of such strategic importance to north west Victoria and to the Riverland region in general should be eligible for government funding via both the State Government and AusLink. For example, the Wodonga LOGIC development mentioned above has been granted some State Government funding to assist with the intermodal freight terminal component. The remainder of funding for that particular project is coming from the City of Wodonga via revenue from land sales within the industrial park.

For a successful development of Thurla it will be critical to prepare a Master Plan covering the projected long term future of the facility and the staged build up of the infrastructure. By following a Master Plan built up from consultation with all key stakeholders, it will be possible to proceed on a solid and rational basis with all stages fully funded before proceeding.

5.5 Economic Assessment

The development of a new intermodal freight facility at Thurla represents a major investment in road/rail container and breakbulk freight handling which will have significant economic benefits for the Mildura/Riverland areas of influence, and for the Victorian economy. The existing facility to handle containers onto rail at Merbein can now take trains up to 1500 m but is limited in its capacity for expansion. A new facility should have the capability of taking even longer trains - up to 2000 m - in order to allow for the eventual connection to the national standard gauge network with the link to the transcontinental line. Similarly, storage and handling of LCL (less than container load) cargo is currently less efficient than in a purpose designed facility.

Table 4 in Appendix A provides a summary of the economic costs and benefits, which have been identified for the proposed facility at Thurla. The costs of relocation of users' own storage facilities currently at Merbein have been included. The economic results indicate that the proposed investment is economically justifiable, with investment costs of \$20.0 million. The principal economic benefits include:

- >> Freight rate savings per TEU, from road to rail, for the Mildura/ Melbourne/ Mildura freight volumes from the Mildura regional economy. TEU forecasts were derived from the Wakefield company. Currently, TEU volumes to Melbourne are approximately 12,000. Future growth in TEU volumes is reflected in the benefit stream;
- >> Increased employment (full time) associated with the new facility. This is induced job growth, in addition to the employment at Merbein, which would be retained; and

- >> Terminal productivity savings associated with improved handling and storage procedures, involving more efficient forklift and equipment utilisation.

Based on experience elsewhere in Australia and internationally, 'state-of-the-art' intermodal container facilities can yield significant economic and environmental benefits to communities, from less dependence on road transport, with resultant savings in fuel, emissions and road accidents. These additional benefits have not been estimated for the proposed Thurla facility. Similarly, stimulus to further exports to the Port of Melbourne from more cost-effective TEU access have not been quantified. These gains have been recognized by the Port of Melbourne and are expected to be significant for the Victorian economy.



6. Water, Electricity and Gas

6.1 Water

Lower Murray Water (LMW) manages water and wastewater services for urban Mildura. Water resources are secured by tradeable bulk entitlements from the water system. Kevin Murphy, Manager Technical Services at Lower Murray Water advised that LMW has planned to a 40 year time frame and can acquire additional entitlement as required.

The treatment and distribution system has recently been upgraded to meet demands for the next ten years and future augmentation steps have been identified. LMW will be able to accelerate augmentation if more rapid growth occurs. If growth is accelerated as a result of transport system improvements, LMW does not believe that water supply will be a constraint on the rate of development.



6.2 Wastewater

LMW is upgrading its treatment facility at Korlong to the west of Mildura to cope with expected demands until the year 2015. Future augmentation works have been identified for the Mildura sewerage and outfall system and these will be implemented as required to meet demand.

The Korlong plant is well located to serve industrial development to the west of the city.

Again LMW does not believe the provision of wastewater services will be a constraint on development in the Mildura system.

6.3 Electricity

The power distribution system is managed by Powercor. Future demand was discussed with John Hardie, the Regional Asset Manager. The supply to Mildura is primarily via two transmission links from the La Trobe valley but there are also connections to the NSW system and the SA system. Powercor has prepared a ten year plan and is confident that supply into the Mildura district is capable of meeting demand for some years beyond the program horizon. There are likely to be local upgrades to serve particular areas within the region but this should not cause problems subject to normal planning and funding procedures.

From the information provided by Powercor, it appears that planning options within the scope of this study are not limited by the ability to supply power to current or projected development.

6.4 Gas

Envestra owns and manages the distribution of gas to the Mildura system. Envestra in South Australia have advised that the existing gas distribution system supplying Mildura has spare capacity and could be readily upgraded by installing compressors to supply demands in excess of 150% of existing demand. This would represent growth exceeding that predicted by the strategy for the next 20 years.

Local distribution extensions or augmentations may be required. These cannot be identified until specific industrial or domestic demands are assessed. In general, it is not expected that gas supply will constrain future development. The costs of extension will lead to different costs for development in different areas but those details are beyond the scope of this study.



7. Environmental Issues

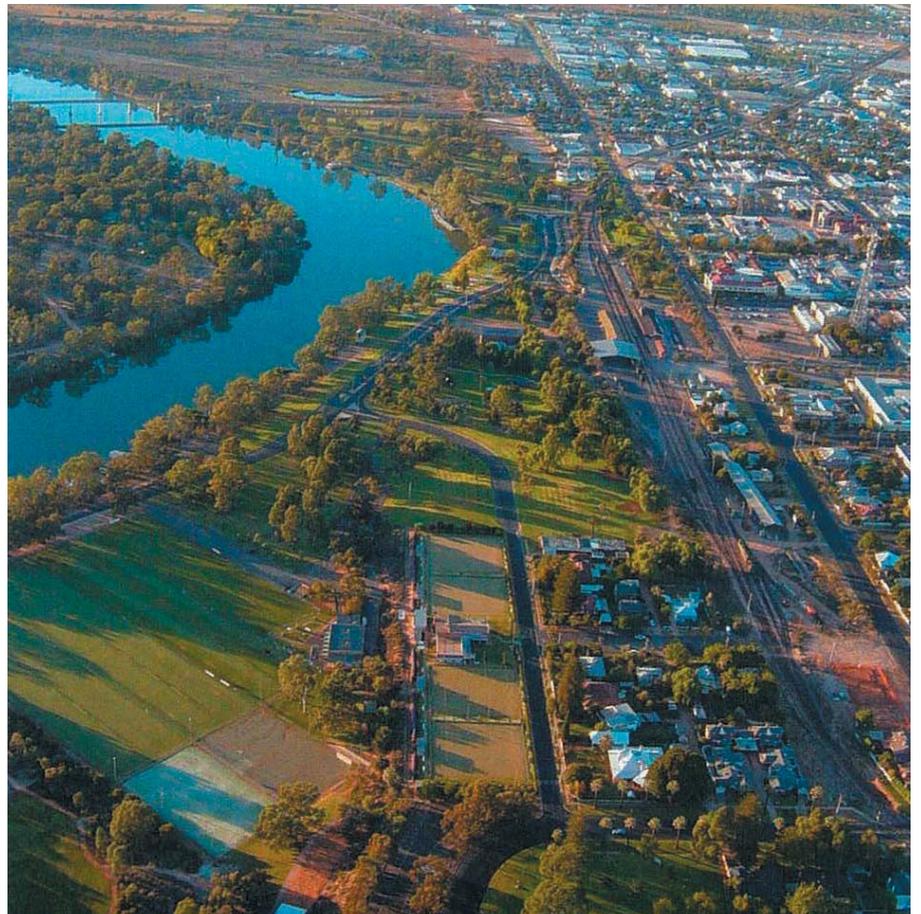
7.1 Present Situation

The existing alignment of the rail takes it in a loop that runs northeast towards the Murray River, then southeast parallel to the river, and then southward towards the Calder Highway. While it is not unusual for a railway line to run within a city's precinct, the railway line in Mildura is distinguished by the high density of level crossings and the small setback of properties from the line.

These two factors by themselves generate a substantial loss of amenity for road users, residents whose houses are located next to the line and for visitors to Mildura, who may regard the section of the line closest to the river as being a physical barrier to gaining access to the riverside areas. Given this unattractive and inappropriate use of prime riverfront land, the location of the Mildura rail line and associated facilities within the city is no longer a positive aspect of the line's present configuration.

Figure 4 below shows an aerial view of the riverfront with the adjacent railway land creating a sterile barrier between the city and the river.

Figure 4 Aerial View Showing Railway Land with Station and Shunting Yard



7.2 Environmental Hazards with Rail through City of Mildura

Environmental hazards presented by the railway line through Mildura include:

- >> A large concentration of level crossings, which:
 - increase travel times;
 - increase fuel consumption of road vehicles; and
 - present a collision risk between road vehicles and rail rolling stock;
- >> Close proximity to residences, utilities, schools, which:
 - causes nuisance noise and vibration;
 - presents a hazard from potential derailment – both from physical impact and from spillage of goods carried on the train; and
 - constrains town planning initiatives due to the bisection of land within city blocks along its alignment: and
- >> The physical barrier and visual detracting that the railway buildings and sidings present on land lying between the Murray River and the adjacent areas of Mildura.

Some specific examples of these considerations are provided below. These are examples only and should not be considered as being a complete assessment of potential consequences of the present location of the rail line.

7.3 Shell and Mobil Fuel Depots

A Shell fuel depot and an adjoining Mobil depot are located on land adjacent to a 500 pupil primary school on the south eastern side of the railway line between Ninth and Tenth Streets. If the occupiers of these two depots were to remove their respective facilities from the sites, the land may be used for a more sensitive purpose, such as extending the primary school site to provide play areas or other school facilities. Notwithstanding intervention by EPA or Council, which may not necessarily occur, the condition in which the sites are left after departure of the fuel companies would be reliant on their respective corporate policy and resultant site rehabilitation works. Figure 5 below shows the Shell depot located on the rail alignment in this residential and educational area.

Figure 5 Shell Depot on Rail Line in Residential Area



7.4 Future Directions

Ministerial Direction No. 1 (May 1992) specifies that land used for the storage of liquid fuel is potentially contaminated. The Direction requires that, in the event of an amendment being made to a planning scheme to allow a more sensitive land use, a planning authority must satisfy itself that the land will be suitable for that purpose. This would typically involve the requirements for issue of a certificate or statement of environmental audit in accordance with Part IXD of the Environment Protection Act 1970.

Given that the two depots noted above are located on Residential 1 Zone land, the requirement for such an audit may not be triggered, as there would be no requirement for a planning scheme amendment. If the land were to be redeveloped for the more sensitive educational use, the requirement by Mildura City Council for a contamination assessment would rely on a high level of awareness of the site's history being exercised by the Council planning department. Ultimately, if the land were to change hands, there would be a reliance on the purchaser to discover the potential for land contamination through a pre-acquisition due diligence process.

In summary, given the history of the fuel depot sites, it should be assumed that the land would not be suitable for sensitive uses until an environmental audit indicates the contrary.

Water Treatment Plant

The railway line is located adjacent to a water treatment plant operated by Lower Murray Water of Seventh Street. Immediately to the west of the water treatment plant, which is down-slope of the line, there is a bend in the railway line passes through a level crossing. Given that the water treatment plant lies on the outside of the bend, there is an increased potential for derailed railway wagons or their load to enter and damage infrastructure at the plant. Removal of rail traffic from the vicinity of such important infrastructure will have an overall benefit to the physical security of such infrastructure. Figure 6 below shows the water treatment plant sited close to the railway line.

Figure 6 Water Treatment Plant on Outside of Bend on Rail Line



7.5 Contamination Assessment

A preliminary, intrusive assessment of potential contamination at the oil depots and along the railway alignment - particularly in the shunting yard - would need to be conducted to identify the extent of contamination at these sites. Further, more targeted assessment, may be required following the preliminary assessment. Once sufficient information on the condition of the sites is held, site rehabilitation would probably need to be conducted. An indicative cost for the preliminary assessment is \$50,000 for each site. Costs of any further site contamination assessment and rehabilitation works cannot be determined until completion of the preliminary assessment.



8. Staging of Transport Proposals

The following staging has been developed to permit a progressive implementation of the overall strategy. This will avoid excessive initial expenditure and will allow a long term approach to be taken.

Appendix C gives a graphical representation of the Stages which are numbered from 1 to 4.

A Master Plan for the transport developments should be prepared by the Mildura Rural City Council based on the proposed staging and taking into account relevant local and regional factors that are outside the scope of this study.

>> Stage 1

- Thurla Intermodal Terminal/Industrial Park development;
- Rail line upgrade from Ballarat to Mildura and interim passenger terminal station at Irymple; construction of the rail spur to Thurla;
- Sturt Highway deviation down Meridian Road and along Morkalla Road and Millewa Road to the Calder Highway; construction of a grade separated interchange at the Calder Highway.

>> Stage 2

- Continuation of the Sturt Highway deviation from the Calder Highway through to a new bridge over the Murray River and a connection to the existing NSW section of the Sturt Highway.

>> Stage 3

- Extension of the rail line from Thurla to Yelta;
- Removal of the existing rail line from the centre of Mildura following the relocation of the Merbein Intermodal Terminal to Thurla;
- Construction of a grade separated entry to the Thurla Intermodal Terminal/Industrial Park

>> Stage 4

- Construction of a rail spur into Mildura Airport;
- Construction of a New Terminal Station for rail passenger services at Mildura airport;
- Removal of the rail line from Irymple to Red Cliffs;
- Construction of the standard gauge rail link from Yelta to the Transcontinental Line at Sayers Lake; the link will be grade separated across the Silver City Highway at Yelta and will cross the Murray River over a new rail bridge;
- Completion of the conversion to standard gauge on the Ballarat to Mildura corridor (this could be implemented independently and would ideally be completed closer to Stage 1 than to Stage 4).

9. References

- >> Connell Wagner Pty Ltd (August 1995), Mildura Freight Operations, Relocation and Redevelopment Study, Rural City of Mildura
- >> Daryl Jackson Pty Ltd, and KLM Gerner (February 2004), Mildura Riverfront Masterplan; Mildura Rural City Council
- >> Department of Infrastructure (May 2002), Strategic Planning Division, North West Freight Transport Strategy, Sunraysia Mallee Economic Development Board
- >> Department of Transport and Regional Services (June 2004), AusLink White Paper
- >> GHD (September 2004) Deakin Avenue Service Station, Traffic Impact Assessment Mr Don Callipari
- >> Johnstone Graeme D (2000), Accidents at Railway Crossings: - A Coroner's Viewpoint, Victorian State Coroner's Office
- >> Knightly Irene (November 2002), The Freight Task in Victoria, A commentary on Commodity, Corridor and Future Growth Forecasts; Ports and marine Division, Department of Infrastructure
- >> Manusell, (October 2004) Mildura Industrial Land Implementation Strategy – Development Cost Report, Mildura Rural City Council
- >> Panel report (February 2005) Mildura Planning Scheme Amendment C28,
- >> Riverside Infrastructure Services (August 2004) Mildura Transport Strategy Paper, Study; Sunraysia Mallee Economic Development Board

Appendix A

Economic Assessment

Tables 1 to 4



Table 1: Economic Appraisal of Mildura Rural City Rail Line Relocation
(\$ Million: 2005 Constant Prices - No GST)

| Year Ended June | Economic Costs ^{1/} | | | Economic Benefits | | | | | | | | Net Benefit Stream | | |
|-----------------|------------------------------|----------------|-------------|---|---|--|---|--|--|---|--|--------------------|-------------------------|--------|
| | Relocation | Rehabilitation | Total Costs | Availability of Foreshore Real Estate with Relocation of Rail ^{2/} | Availability of Industrial Land with Relocation ^{3/} | Truck Time Savings from Eliminated Level Crossings ^{4/} | Truck Fuel Cost Savings from Eliminated Level Crossings ^{5/} | Induced Urban Investment ^{6/} | Induced Local Employment ^{7/} | Induced Tourism Expenditure ^{8/} | Perceived Community Benefits (WTP) ^{9/} | | Total Economic Benefits | |
| 1 | 2006 | 40.00 | 2.00 | 42.00 | | | | | | | | | | -42.00 |
| 2 | 2007 | 35.00 | | 35.00 | | | | | | | | | | -35.00 |
| 3 | 2008 | | | | 12.00 | 2.00 | 89.00 | 95.00 | 4.50 | 1.13 | 2.29 | 0.31 | 206.23 | 206.23 |
| 4 | 2009 | | | | | | 90.34 | 96.43 | 4.50 | 1.16 | 2.35 | 0.32 | 195.08 | 195.08 |
| 5 | 2010 | | | | | | 91.69 | 97.87 | | 1.19 | 2.41 | 0.33 | 193.48 | 193.48 |
| 6 | 2011 | | | | | | 93.07 | 99.34 | | 1.22 | 2.47 | 0.33 | 196.42 | 196.42 |
| 7 | 2012 | | | | | | 94.46 | 100.83 | | 1.25 | 2.53 | 0.34 | 199.41 | 199.41 |
| 8 | 2013 | | | | | | 95.88 | 102.34 | | 1.28 | 2.59 | 0.35 | 202.44 | 202.44 |
| 9 | 2014 | | | | | | 97.32 | 103.88 | | 1.31 | 2.66 | 0.36 | 205.52 | 205.52 |
| 10 | 2015 | | | | | | 98.78 | 105.44 | | 1.34 | 2.72 | 0.37 | 208.65 | 208.65 |
| 11 | 2016 | | | | | | 100.26 | 107.02 | | 1.38 | 2.79 | 0.38 | 211.82 | 211.82 |
| 12 | 2017 | | | | | | 101.76 | 108.62 | | 1.41 | 2.86 | 0.39 | 215.04 | 215.04 |
| 13 | 2018 | | | | | | 103.29 | 110.25 | | 1.45 | 2.93 | 0.40 | 218.31 | 218.31 |
| 14 | 2019 | | | | | | 104.84 | 111.91 | | 1.48 | 3.00 | 0.41 | 221.64 | 221.64 |
| 15 | 2020 | | | | | | 106.41 | 113.58 | | 1.52 | 3.08 | 0.42 | 225.01 | 225.01 |
| 16 | 2021 | | | | | | 108.01 | 115.29 | | 1.56 | 3.16 | 0.43 | 228.44 | 228.44 |
| 17 | 2022 | | | | | | 109.63 | 117.02 | | 1.60 | 3.24 | 0.44 | 231.91 | 231.91 |
| 18 | 2023 | | | | | | 111.27 | 118.77 | | 1.64 | 3.32 | 0.45 | 235.44 | 235.44 |
| 19 | 2024 | | | | | | 112.94 | 120.55 | | 1.68 | 3.40 | 0.46 | 239.03 | 239.03 |
| 20 | 2025 | | | | | | 114.63 | 122.36 | | 1.72 | 3.48 | 0.47 | 242.67 | 242.67 |

- 1/ Assumes all relocation work including new intermodal facility and closure of Merbein is completed in 2 years.
- 2/ 3/ Real estate estimation of market value of Victrack land associated with the rail easement and station precinct, no longer required and available for new commercial use.
- 3/ 4/ Based on time savings of commercial trucking movements (3 minutes per delay, 4 delays per day, 2 trucks per crossing, 20 crossings eliminated; average truck cost time of \$20.90 per hour [labour and fleet investment]).
- 5/ Assumes average fuel cost saving per truck of \$22.00 per hour, at each of the 20 crossings eliminated.
- 6/ Assumes an additional minimum capital investment in new buildings of \$9 million, to capture the visual appeal after line removal.
- 7/ Additional incremental employment of 25 new full-time jobs in the new commercial buildings/services.
- 8/ Assumes incremental visitor expenditures from 176,000 additional visitor nights (55,000 additional visitors [domestic and international]).
- 9/ Community valuation of additional open space areas, based on the average cost of driving access (an additional 2,000 visits per week).

Economic Internal Rate of Return (EIRR) = 145.91%
Benefit-Cost Ratio (BCR) = 31.28
Net Present Value (NPV) of Benefits = \$2,199.16
Net Present Value (NPV) of Costs = \$70.29
Net Present Value (NPV) [Million] = \$2,128.86

Table 3: Economic Appraisal of New Sturt Highway and Bridge Crossing
 (\$ Million: 2005 Constant Prices - No GST)

| Year Ended June | Economic Costs ^{1/} | | | Economic Benefits | | | | | | Net Benefit Stream | |
|-----------------|------------------------------|-----------|-------------|---|--|---|--|---|-------------------------|--------------------|--------|
| | Capital | New O & M | Total Costs | Avoided ^{2/} Costs of Chaffey Bridge | Road ^{3/} Travel Time Savings | Savings ^{4/} in Road Maintenance | Savings in Truck VOC Costs ^{5/} | Savings ^{6/} in Road Accidents | Total Economic Benefits | | |
| | | | | | | | | | | | |
| 1 | 2006 | 45.00 | | 45.00 | 20.00 | | | | | 20.00 | -25.00 |
| 2 | 2007 | 50.00 | | 50.00 | | | | | | 0.00 | -50.00 |
| 3 | 2008 | | 2.00 | 2.00 | | 6.81 | 0.50 | 1.08 | 0.68 | 9.07 | 7.07 |
| 4 | 2009 | | 2.00 | 2.00 | | 6.91 | 0.50 | 1.10 | 0.69 | 9.20 | 7.20 |
| 5 | 2010 | | 2.00 | 2.00 | | 7.02 | 0.50 | 1.11 | 0.70 | 9.33 | 7.33 |
| 6 | 2011 | | 2.00 | 2.00 | | 7.12 | 0.50 | 1.13 | 0.71 | 9.46 | 7.46 |
| 7 | 2012 | | 2.00 | 2.00 | | 7.23 | 0.50 | 1.15 | 0.72 | 9.60 | 7.60 |
| 8 | 2013 | | 2.00 | 2.00 | | 7.34 | 0.50 | 1.16 | 0.73 | 9.73 | 7.73 |
| 9 | 2014 | | 2.00 | 2.00 | | 7.45 | 0.50 | 1.18 | 0.74 | 9.87 | 7.87 |
| 10 | 2015 | | 2.00 | 2.00 | | 7.56 | 0.50 | 1.20 | 0.75 | 10.01 | 8.01 |
| 11 | 2016 | | 2.00 | 2.00 | | 7.67 | 0.50 | 1.22 | 0.77 | 10.15 | 8.15 |
| 12 | 2017 | | 2.00 | 2.00 | | 7.79 | 0.50 | 1.23 | 0.78 | 10.30 | 8.30 |
| 13 | 2018 | | 2.00 | 2.00 | | 7.90 | 0.50 | 1.25 | 0.79 | 10.45 | 8.45 |
| 14 | 2019 | | 2.00 | 2.00 | | 8.02 | 0.50 | 1.27 | 0.80 | 10.60 | 8.60 |
| 15 | 2020 | | 2.00 | 2.00 | | 8.14 | 0.50 | 1.29 | 0.81 | 10.75 | 8.75 |
| 16 | 2021 | | 2.00 | 2.00 | | 8.26 | 0.50 | 1.31 | 0.83 | 10.90 | 8.90 |
| 17 | 2022 | | 2.00 | 2.00 | | 8.39 | 0.50 | 1.33 | 0.84 | 11.06 | 9.06 |
| 18 | 2023 | | 2.00 | 2.00 | | 8.51 | 0.50 | 1.35 | 0.85 | 11.21 | 9.21 |
| 19 | 2024 | | 2.00 | 2.00 | | 8.64 | 0.50 | 1.37 | 0.86 | 11.38 | 9.38 |
| 20 | 2025 | | 2.00 | 2.00 | | 8.77 | 0.50 | 1.39 | 0.88 | 11.54 | 9.54 |

- 1/ Assumes 2-year construction and annual O & M costs of \$2 million over the life of the project.
- 2/ Expenditure which will be avoided with the investment.
- 3/ Based on average time saving of 30 minutes per vehicle, \$8.50 per car, \$20.90 per truck (60/40 car/truck split).
- 4/ Savings from old road maintenance now avoided.
- 5/ Savings in fuel/brakes/tyres associated with truck time savings and improved pavement.
- 6/ Assumes 50% reduction in annual accident level (non-fatal) per year; based on average cost of minor/significant accidents of \$45,000 (vehicles, police, ambulance, hospital, etc.).

| | |
|---|----------|
| Economic Internal Rate of Return (EIRR) = | 7.60% |
| Benefit-Cost Ratio (BCR) = | 1.06 |
| Net Present Value (NPV) of Benefits = | \$110.90 |
| Net Present Value (NPV) of Costs = | \$104.73 |
| Net Present Value (NPV) [Million]= | \$6.17 |

Table 2: Economic Appraisal of Northern Link to Transcontinental Standard Gauge Network
(\$ Million: 2005 Constant Prices - No GST)

| Year Ended June | Economic Costs ^{1/} | | | | Economic Benefits | | | | | Net Benefit Stream | |
|-----------------------|------------------------------|---------|--------------|----------------|--|--|---|---------------|-------------------------------|--------------------------|---------|
| | Land Acquisition | Capital | New O & M | Total Costs | Mineral Sands Rail Freight Savings ^{2/} (Road to Rail) | Induced Employ- ment ^{3/} | Savings in Freight Rate via Access to Standard Gauge Networks ^{4/} | | Total Economic Benefits | | |
| | | | | | | | Adelaide-Melb. | Melb. - Perth | | | |
| 1 | 2006 | 15.00 | 110.00 | | 125.00 | | | | | 0.00 | -125.00 |
| 2 | 2007 | | 100.00 | | 100.00 | | | | | 0.00 | -100.00 |
| 3 | 2008 | | | 1.50 | 1.50 | 2.75 | 0.75 | 1.48 | 11.28 | 16.26 | 14.76 |
| 4 | 2009 | | | 1.50 | 1.50 | 4.13 | 0.75 | 1.58 | 12.07 | 18.53 | 17.03 |
| 5 | 2010 | | | 1.50 | 1.50 | 5.50 | 0.75 | 1.69 | 12.91 | 20.86 | 19.36 |
| 6 | 2011 | | | 1.50 | 1.50 | 5.50 | 0.75 | 1.81 | 13.82 | 21.88 | 20.38 |
| 7 | 2012 | | | 1.50 | 1.50 | 5.50 | 0.75 | 1.94 | 14.79 | 22.98 | 21.48 |
| 8 | 2013 | | | 1.50 | 1.50 | 5.50 | 0.75 | 2.08 | 15.82 | 24.15 | 22.65 |
| 9 | 2014 | | | 1.50 | 1.50 | 5.50 | 0.75 | 2.22 | 16.93 | 25.40 | 23.90 |
| 10 | 2015 | | | 1.50 | 1.50 | 5.50 | 0.75 | 2.38 | 18.11 | 26.74 | 25.24 |
| 11 | 2016 | | | 1.50 | 1.50 | 5.50 | 0.75 | 2.50 | 19.02 | 27.76 | 26.26 |
| 12 | 2017 | | | 1.50 | 1.50 | 5.50 | 0.75 | 2.62 | 19.97 | 28.84 | 27.34 |
| 13 | 2018 | | | 1.50 | 1.50 | 5.50 | 0.75 | 2.75 | 20.97 | 29.97 | 28.47 |
| 14 | 2019 | | | 1.50 | 1.50 | 5.50 | 0.75 | 2.89 | 22.02 | 31.16 | 29.66 |
| 15 | 2020 | | | 1.50 | 1.50 | 5.50 | 0.75 | 3.03 | 23.12 | 32.40 | 30.90 |
| 16 | 2021 | | | 1.50 | 1.50 | 5.50 | 0.75 | 3.18 | 24.27 | 33.71 | 32.21 |
| 17 | 2022 | | | 1.50 | 1.50 | 5.50 | 0.75 | 3.34 | 25.49 | 35.08 | 33.58 |
| 18 | 2023 | | | 1.50 | 1.50 | 5.50 | 0.75 | 3.51 | 26.76 | 36.52 | 35.02 |
| 19 | 2024 | | | 1.50 | 1.50 | 5.50 | 0.75 | 3.69 | 28.10 | 38.04 | 36.54 |
| 20 | 2025 | | | 1.50 | 1.50 | 5.50 | 0.75 | 3.87 | 29.50 | 39.63 | 38.13 |

1/ Assumes a construction period of 2 years; annual new maintenance costs of \$1.5 million per annum.

2/ Assumes road to rail freight saving of \$5.50 per tonne (includes a road tax of \$1 per tonne) and production reaching 1 million tonnes after three years. Assumes annual minimum mineral sand production initially of 500,000 tonnes and a mine life of 20 years for the mineral sand deposit.

3/ Based on an additional full-time work force of 15 full-time technical staff for track maintenance and security.

4/ Assumes freight rate savings of \$45.00 per TEU on Adelaide-Melbourne and \$280.00 per TEU on Melbourne-Perth link, with annual TEU growth rates of 7% for the first 10 years and 5% after Year 10.

| | |
|---|----------|
| Economic Internal Rate of Return (EIRR) = | 7.62% |
| Benefit-Cost Ratio (BCR) = | 1.10 |
| Net Present Value (NPV) of Benefits = | \$241.10 |
| Net Present Value (NPV) of Costs = | \$219.33 |
| Net Present Value (NPV) [Million]= | \$21.77 |

**Table 4: Economic Appraisal of Thurla Intermodal Terminal
(\$ Million: 2005 Constant Prices - No GST)**

| Year Ended June | Economic Costs ^{1/} | | | | Economic Benefits | | | | Net Benefit Stream | |
|-----------------------|------------------------------|--------------|----------------------------|----------------|--|---|--|-------------------------------|--------------------------|--------|
| | | | | | Rail Freight ^{2/} Rate Savings per TEU | ^{3/} Induced Employ- ment | Terminal ^{4/} Productivity Savings per TEU | Total Economic Benefits | | |
| | Capital | New O & M | Relocation from Merbein | Total Costs | | | | | | |
| 1 | 2006 | 15.00 | | 5.00 | 20.00 | | | | 0.00 | -20.00 |
| 2 | 2007 | | 2.00 | | 2.00 | 2.25 | 0.90 | 0.45 | 3.60 | 1.60 |
| 3 | 2008 | | 2.00 | | 2.00 | 2.36 | 1.13 | 0.47 | 3.97 | 1.97 |
| 4 | 2009 | | 2.00 | | 2.00 | 2.48 | 1.35 | 0.50 | 4.33 | 2.33 |
| 5 | 2010 | | 2.00 | | 2.00 | 2.60 | 1.35 | 0.52 | 4.48 | 2.48 |
| 6 | 2011 | | 2.00 | | 2.00 | 2.73 | 1.35 | 0.55 | 4.63 | 2.63 |
| 7 | 2012 | | 2.00 | | 2.00 | 2.87 | 1.35 | 0.57 | 4.80 | 2.80 |
| 8 | 2013 | | 2.00 | | 2.00 | 3.02 | 1.35 | 0.60 | 4.97 | 2.97 |
| 9 | 2014 | | 2.00 | | 2.00 | 3.17 | 1.35 | 0.63 | 5.15 | 3.15 |
| 10 | 2015 | | 2.00 | | 2.00 | 3.32 | 1.35 | 0.66 | 5.34 | 3.34 |
| 11 | 2016 | | 2.00 | | 2.00 | 3.42 | 1.35 | 0.68 | 5.46 | 3.46 |
| 12 | 2017 | | 2.00 | | 2.00 | 3.53 | 1.35 | 0.71 | 5.58 | 3.58 |
| 13 | 2018 | | 2.00 | | 2.00 | 3.63 | 1.35 | 0.73 | 5.71 | 3.71 |
| 14 | 2019 | | 2.00 | | 2.00 | 3.74 | 1.35 | 0.75 | 5.84 | 3.84 |
| 15 | 2020 | | 2.00 | | 2.00 | 3.85 | 1.35 | 0.77 | 5.97 | 3.97 |
| 16 | 2021 | | 2.00 | | 2.00 | 3.97 | 1.35 | 0.79 | 6.11 | 4.11 |
| 17 | 2022 | | 2.00 | | 2.00 | 4.09 | 1.35 | 0.82 | 6.26 | 4.26 |
| 18 | 2023 | | 2.00 | | 2.00 | 4.21 | 1.35 | 0.84 | 6.40 | 4.40 |
| 19 | 2024 | | 2.00 | | 2.00 | 4.34 | 1.35 | 0.87 | 6.55 | 4.55 |
| 20 | 2025 | | 2.00 | | 2.00 | 4.47 | 1.35 | 0.89 | 6.71 | 4.71 |

1/ Assumes 1 year of development; costs of relocation and annual maintenance of new facilities.

2/ Assumes 12,000 TEUs in 2006, 15,000 in 2007 and growth of 5% per annum over 10 years and 3% per annum after 10 years. Assumes average saving of \$150 per TEU

3/ Assumes an additional incremental work force growth of 30 full-time jobs after 3 years.

4/ Terminal productivity savings associated with better utilisation of handling equipment and direct loading of containers for longer train lengths.

Economic Internal Rate of Return (EIRR) = 12.65%

Benefit-Cost Ratio (BCR) = 1.31

Net Present Value (NPV) of Benefits = \$51.05

Net Present Value (NPV) of Costs = \$38.94

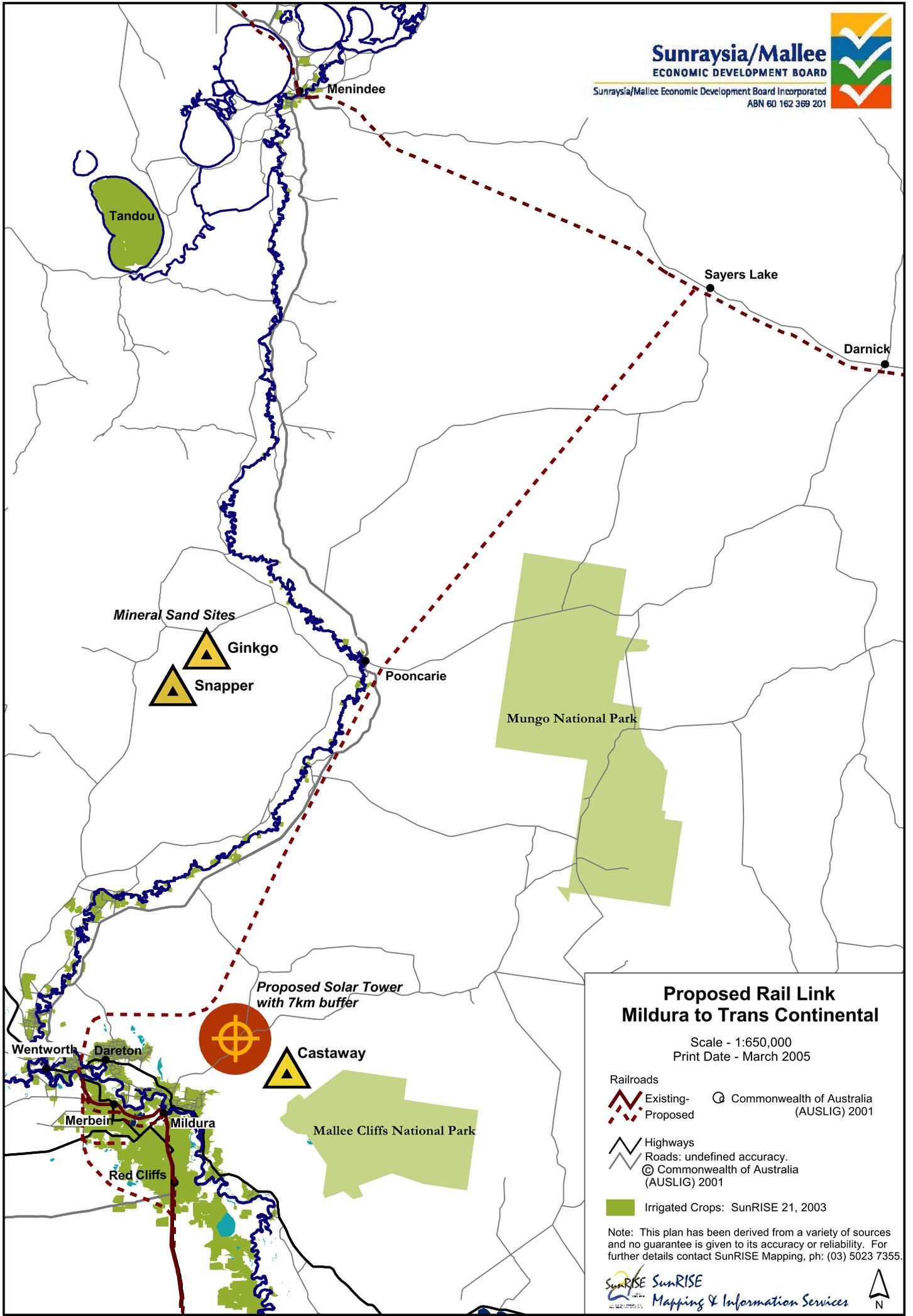
Net Present Value (NPV) [Million]= \$12.11



Appendix B

Transcontinental Rail Line Maps





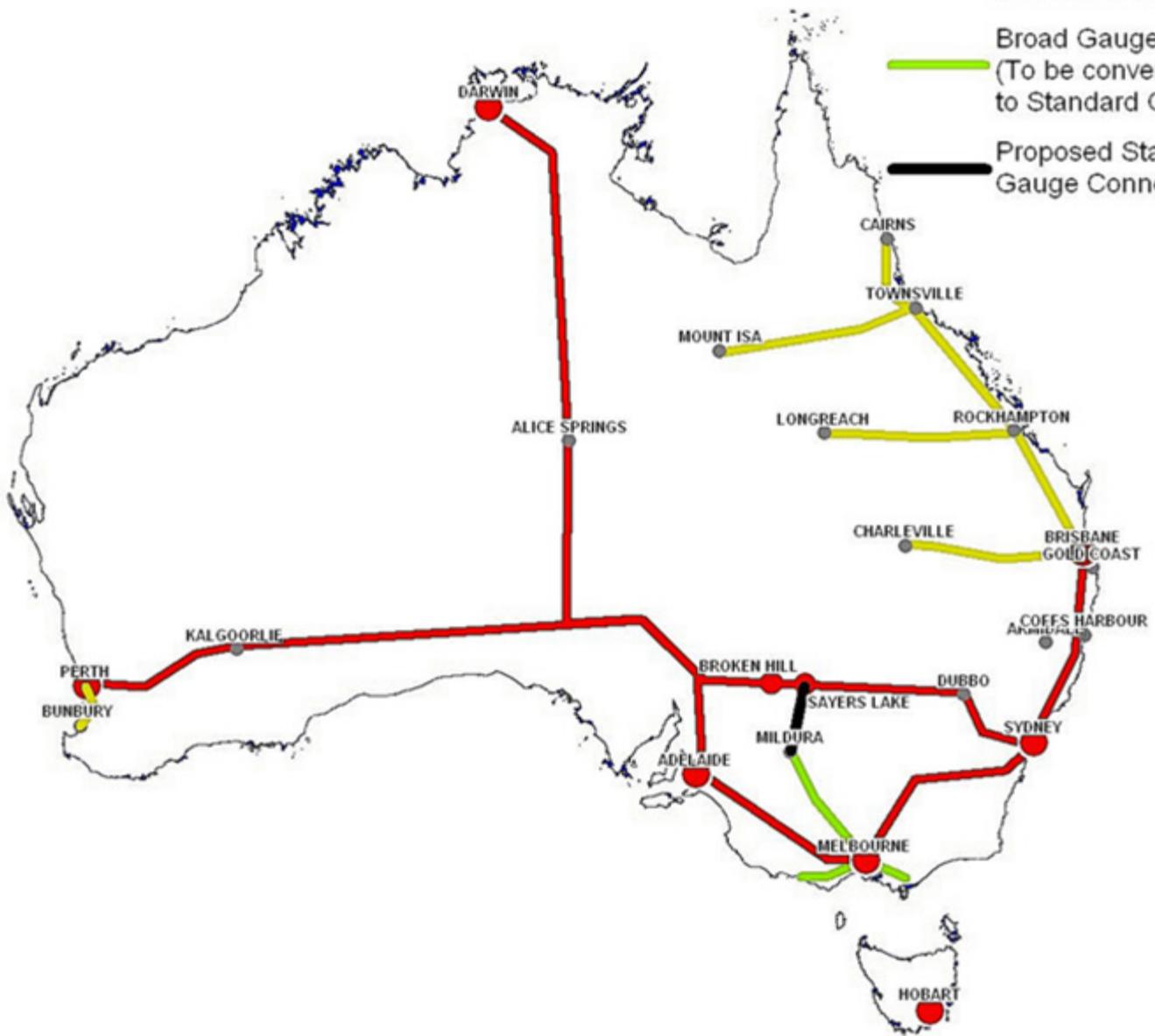
**Proposed Rail Link
Mildura to Trans Continental**

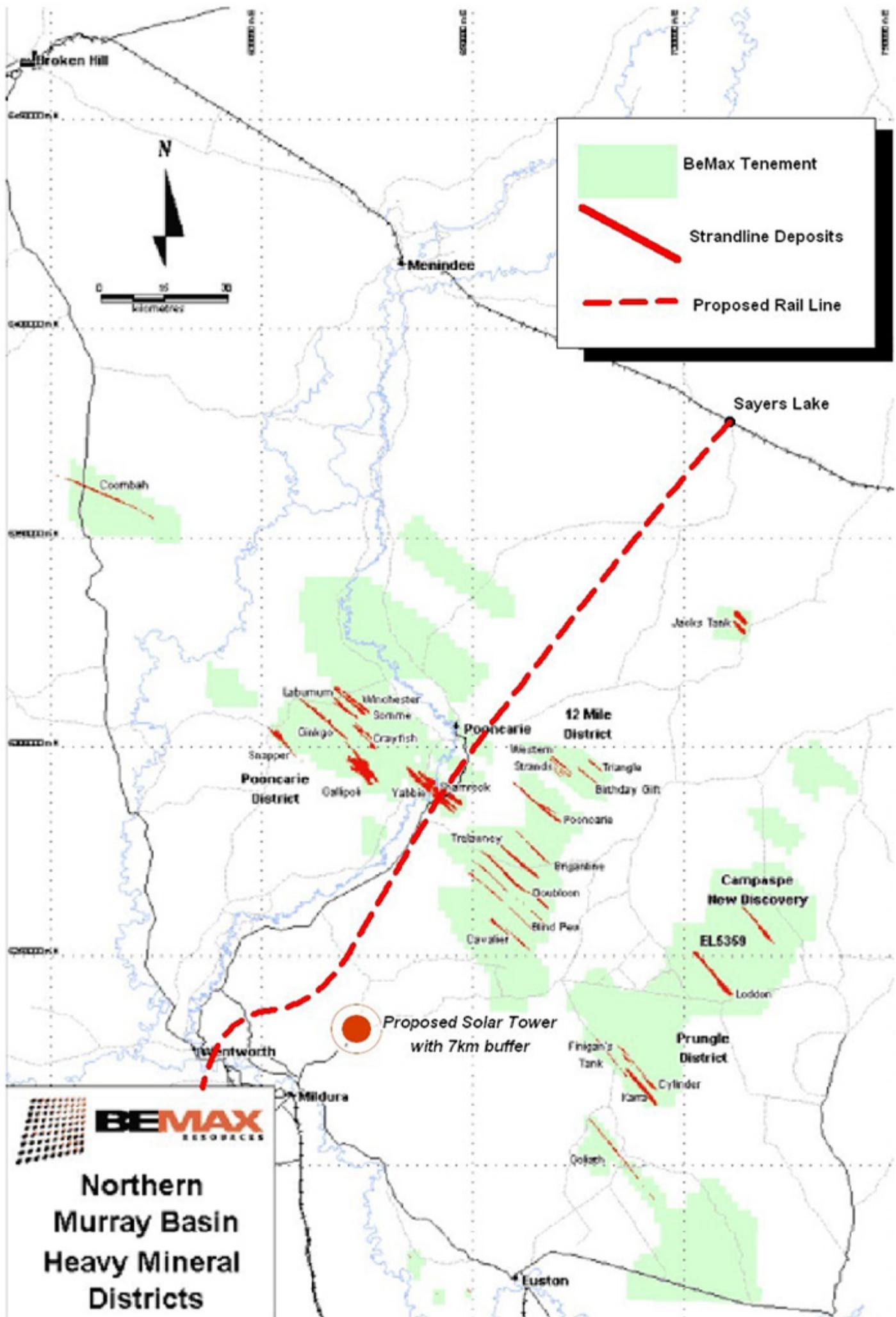
Scale - 1:650,000
Print Date - March 2005

- Existing-Proposed Railroads
- Highways
- Irrigated Crops: SunRISE 21, 2003
- Commonwealth of Australia (AUSLIG) 2001
- Roads: undefined accuracy. © Commonwealth of Australia (AUSLIG) 2001

Note: This plan has been derived from a variety of sources and no guarantee is given to its accuracy or reliability. For further details contact SunRISE Mapping, ph: (03) 5023 7355.

- Narrow Gauge
- Standard Gauge
National Network
- Broad Gauge
(To be converted to Standard Gauge)
- Proposed Standard Gauge Connection



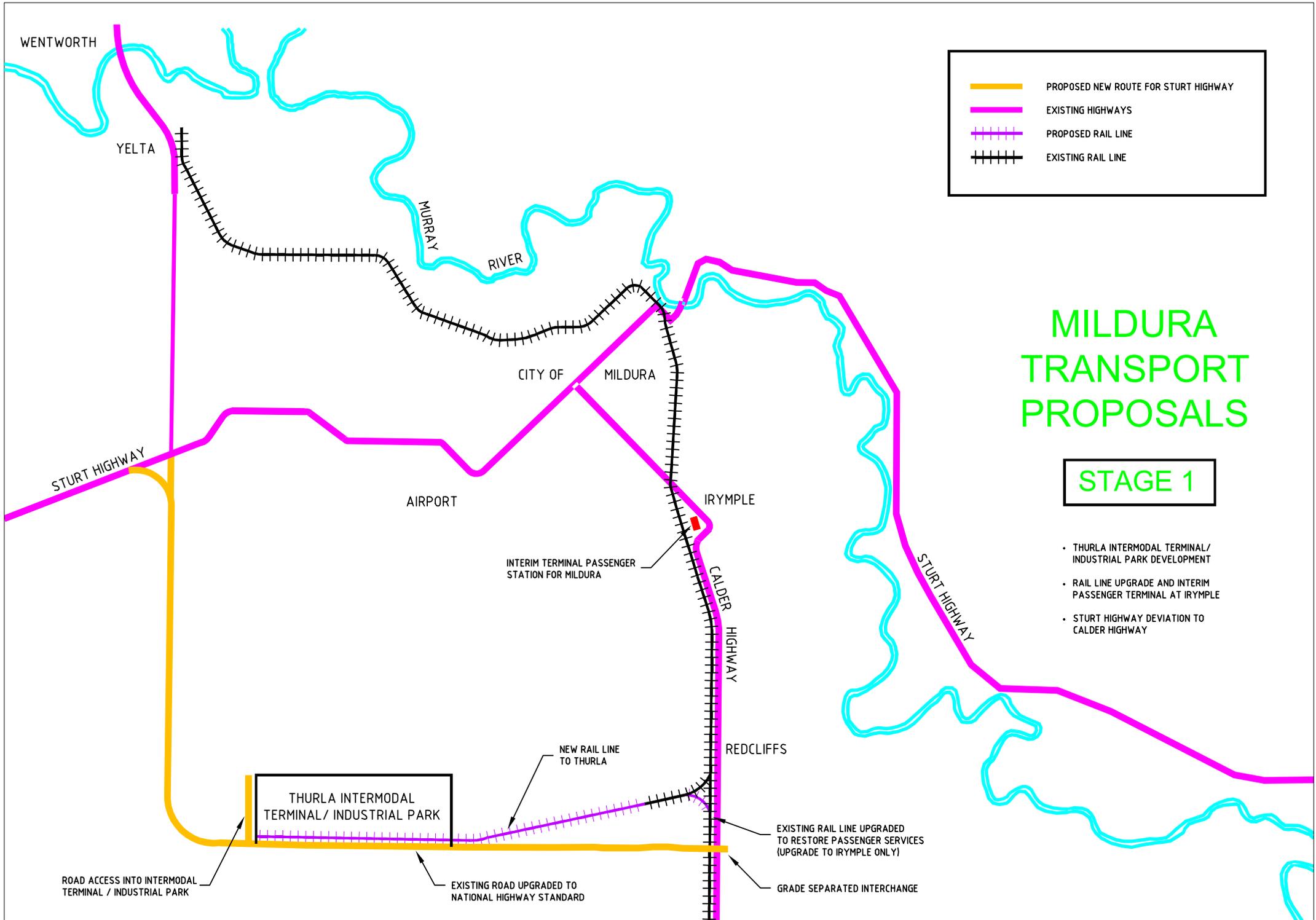




Appendix C

Staging Diagrams





| | |
|---|--------------------------------------|
|  | PROPOSED NEW ROUTE FOR STURT HIGHWAY |
|  | EXISTING HIGHWAYS |
|  | PROPOSED RAIL LINE |
|  | EXISTING RAIL LINE |

MILDURA TRANSPORT PROPOSALS

STAGE 1

- THURLA INTERMODAL TERMINAL/ INDUSTRIAL PARK DEVELOPMENT
- RAIL LINE UPGRADE AND INTERIM PASSENGER TERMINAL AT IRYMPLE
- STURT HIGHWAY DEVIATION TO CALDER HIGHWAY

ROAD ACCESS INTO INTERMODAL TERMINAL / INDUSTRIAL PARK

THURLA INTERMODAL TERMINAL / INDUSTRIAL PARK

EXISTING ROAD UPGRADED TO NATIONAL HIGHWAY STANDARD

NEW RAIL LINE TO THURLA

EXISTING RAIL LINE UPGRADED TO RESTORE PASSENGER SERVICES (UPGRADE TO IRYMPLE ONLY)

GRADE SEPARATED INTERCHANGE

WENTWORTH

YELTA

MURRAY RIVER

RIVER

CITY OF MILDURA

AIRPORT

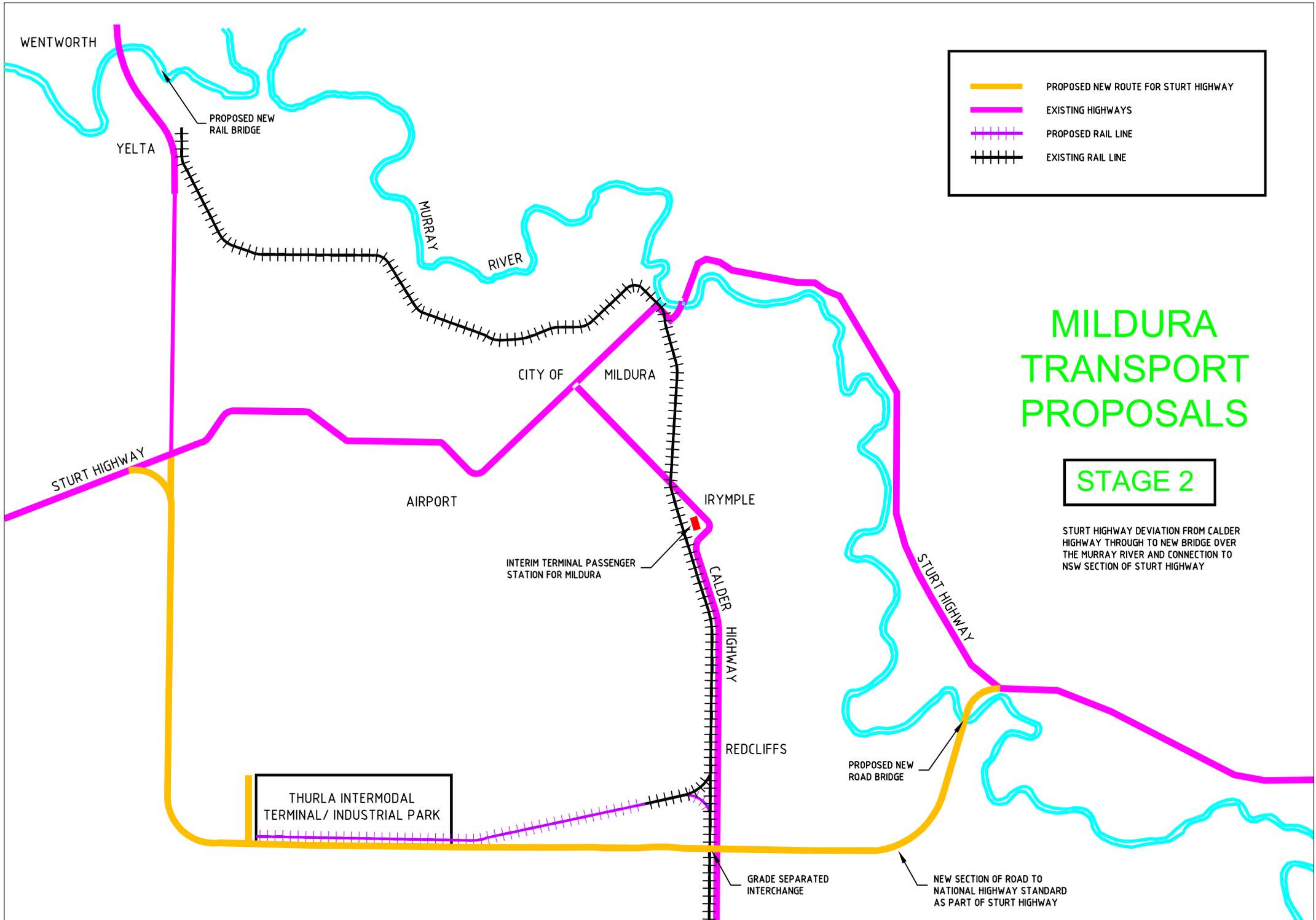
IRYMPLE

INTERIM TERMINAL PASSENGER STATION FOR MILDURA

CALDER HIGHWAY

REDCLIFFS

STURT HIGHWAY



- PROPOSED NEW ROUTE FOR STURT HIGHWAY
- EXISTING HIGHWAYS
- + + + + PROPOSED RAIL LINE
- + + + + EXISTING RAIL LINE

MILDURA TRANSPORT PROPOSALS

STAGE 2

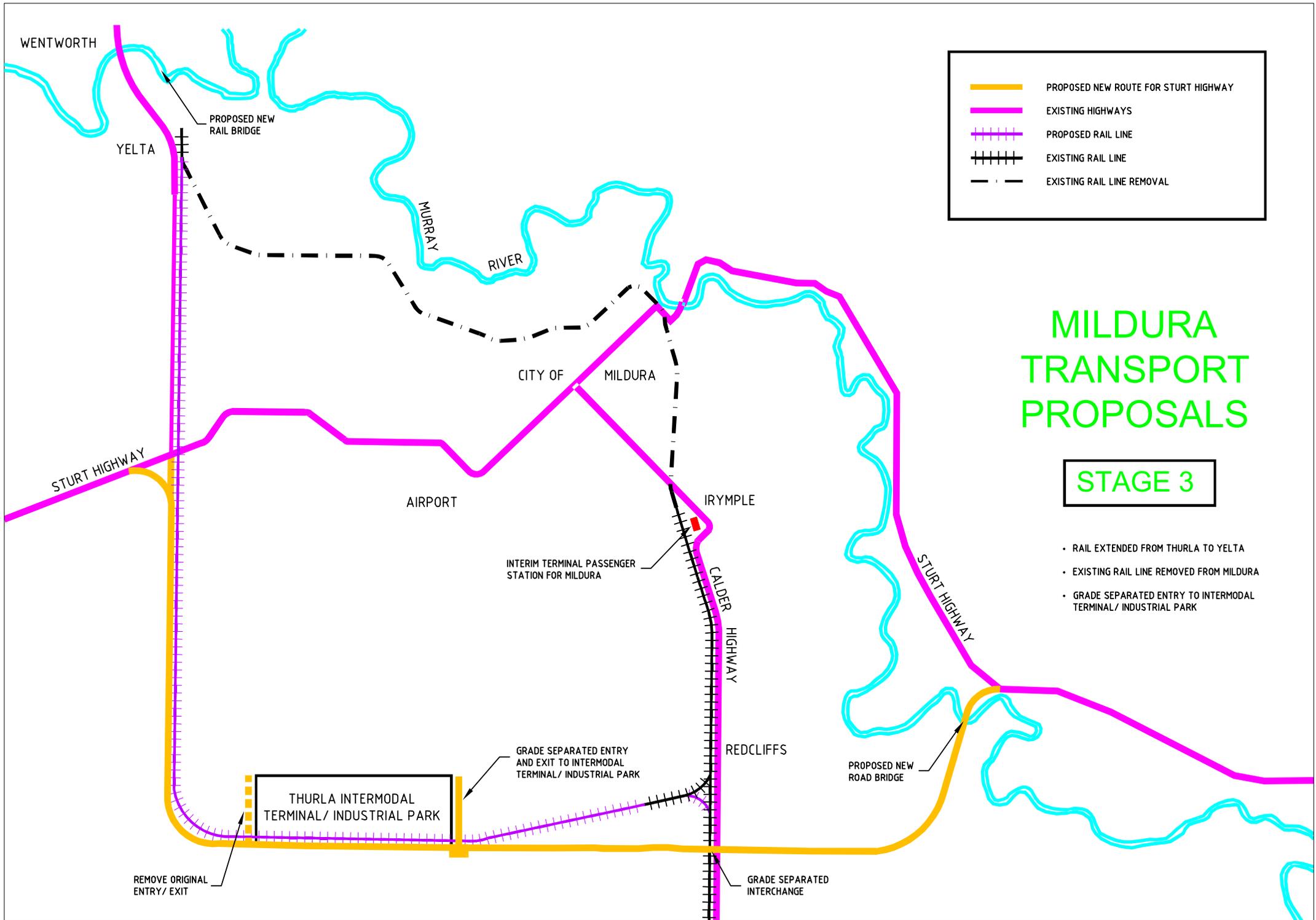
STURT HIGHWAY DEVIATION FROM CALDER HIGHWAY THROUGH TO NEW BRIDGE OVER THE MURRAY RIVER AND CONNECTION TO NSW SECTION OF STURT HIGHWAY

THURLA INTERMODAL
TERMINAL / INDUSTRIAL PARK

GRADE SEPARATED
INTERCHANGE

PROPOSED NEW
ROAD BRIDGE

NEW SECTION OF ROAD TO
NATIONAL HIGHWAY STANDARD
AS PART OF STURT HIGHWAY



WENTWORTH

YELTA

PROPOSED NEW
RAIL BRIDGE

MURRAY
RIVER

RIVER

CITY OF
MILDURA

AIRPORT

IRYMPLE

INTERIM TERMINAL PASSENGER
STATION FOR MILDURA

CALDER
HIGHWAY

REDCLIFFS

PROPOSED NEW
ROAD BRIDGE

THURLA INTERMODAL
TERMINAL/ INDUSTRIAL PARK

GRADE SEPARATED ENTRY
AND EXIT TO INTERMODAL
TERMINAL/ INDUSTRIAL PARK

REMOVE ORIGINAL
ENTRY/ EXIT

GRADE SEPARATED
INTERCHANGE

| | |
|--|--------------------------------------|
| | PROPOSED NEW ROUTE FOR STURT HIGHWAY |
| | EXISTING HIGHWAYS |
| | PROPOSED RAIL LINE |
| | EXISTING RAIL LINE |
| | EXISTING RAIL LINE REMOVAL |

MILDURA TRANSPORT PROPOSALS

STAGE 3

- RAIL EXTENDED FROM THURLA TO YELTA
- EXISTING RAIL LINE REMOVED FROM MILDURA
- GRADE SEPARATED ENTRY TO INTERMODAL TERMINAL/ INDUSTRIAL PARK



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