Roads to Export

Greater Bunbury

Infrastructure Investment Plan
Acknowledgement
The South West Development Commission, Bunbury Wellington Economic Alliance, Bunbury Port Authority and The Chamber of Minerals & Energy WA acknowledge the research completed by Economics Consulting Services in the preparation of this document.
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The South West region’s strong and resilient economy reflects the importance of the resources sector, Bunbury Port, industrial parks at Kemerton, Preston and Shotts and the interconnecting transport linkages.

Gross Regional Product for the South West has increased by 67 per cent over the past five years and climbed to $11.3 billion for the 2008/09 financial year. Economic productivity per capita is $71,596 and exceeds the national average by $16,850. These exciting trends are expected to continue, but not without significant challenge.

The labour force in the Bunbury region is expected to grow to about 47,000 by 2031, which will require an estimated 10,000 jobs to maintain economic and social strength and stability.

The region’s industrial parks at Kemerton, Preston and Shotts collectively cover about 2,500 hectares that, at the current level of development, would provide a very sound economic base on which to build the job opportunities that are required to meet the demands of forecast population growth.

However, to realise this economic potential the industrial parks must be connected to the Bunbury port by efficient and safe road and rail transport linkages. This transport network includes the Port Access Road, Bunbury Outer Ring Road, a second railway line from Brunswick to the Port and upgrades to the Coalfields Highway and Eelup Roundabout. Relocation of the Preston River will enable the Bunbury Port Authority to expand the inner harbour to provide the essential berths and handling facilities needed to accommodate planned increases in alumina, bauxite, mineral sands, urea and woodchip production. Reconromanising of the Picton to Greenbushes railway line is also part of the infrastructure network.
We are very pleased to present this report which offers a compelling case for investment to improve local transport infrastructure. This will help to maintain regional economic resilience and growth and the valuable contribution the South West makes to State and national productivity.

This version of Roads to Export has been amended to replace superseded cost figures that were current when this report was first compiled in October 2009. Costs shown now account for State Budget allocations that apply from 1 July 2010.

Steve Harrison
Chairman
South West Development Commission

Clayton Hyder
Chairman
Bunbury Wellington Economic Alliance

Neema Premji
Chairperson
Bunbury Port Authority

Reg Howard-Smith
Chief Executive
Chamber of Minerals and Energy WA

October 2010
The South West of Western Australia requires an investment of $623 million to complete Bunbury port-linked transport infrastructure and underpin the continuation of the decade-long trend of increasing productivity.

Transport infrastructure in the Bunbury-Wellington area is operating at or near capacity. Natural population growth and major project developments will place significant demands on transport and port infrastructure. Without a significant upgrade project investments will be lost and existing operations constrained by transport bottlenecks.

The various infrastructure projects are closely linked. Leaving out one component will expose that component as the future weak link in the chain, limit future growth and increase overall long-term costs.

The second aspect of future infrastructure development is timing. An immediate start on construction is essential if the planned timetables for resource and industry projects are to be realised.

The needs of the community for safer roads, reduced travel times, reduced pollution and a more pleasant living and working environment will also be delivered by the same infrastructure solution.
There is a strong benefit cost outcome for the proposed investments. This analysis concludes that a start should be made as soon as practicable for the unfunded infrastructure components, which require an investment of $623 million.

The components of this expenditure are set out in the following table.

### Unfunded components (estimates in 2009/10 dollars) ($ million)

<table>
<thead>
<tr>
<th>Component</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brunswick-Port rail (second track)</td>
<td>63</td>
</tr>
<tr>
<td>Bunbury Outer Ring Road (completion)</td>
<td>365</td>
</tr>
<tr>
<td>Preston River diversion</td>
<td>65</td>
</tr>
<tr>
<td>Eelup Roundabout (fly-over)</td>
<td>95</td>
</tr>
<tr>
<td>Coalfields Highway</td>
<td>35</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>623</strong></td>
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</table>

### Committed funding (as at 1 July 2010) ($ million)

<table>
<thead>
<tr>
<th>Component</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port Access Road (Stage 2)</td>
<td>63</td>
</tr>
<tr>
<td>Bunbury Outer Ring Road Stage 1</td>
<td>59</td>
</tr>
<tr>
<td>(Boyanup-Picton to South Western Highway)</td>
<td></td>
</tr>
<tr>
<td>Coalfields Highway (2010-2012)</td>
<td>14</td>
</tr>
<tr>
<td>Eelup Roundabout (Stage 1)</td>
<td>16</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>152</strong></td>
</tr>
</tbody>
</table>

Figures include commitments from both Western Australian and Commonwealth Governments to 2013.

Safer roads and reduced travel times will be delivered at the same time as the infrastructure solution.
The South West has the State’s most diversified economy.

Gross Regional Product (GRP) has increased from $4.042 billion in 1997/1998 to $11.3 billion in 2008/2009, an average annual increase of 8.4 per cent. Economic product per capita for the South West region is $71,596, well ahead of the national average of $54,746. Investment in the port-linked transport infrastructure is expected to increase productivity by about 20 per cent.

The South West has the State’s most diversified economy; the principal components are mining, manufacturing, retailing, tourism and agriculture. Mining output ranks internationally with the region producing more than half the world’s tantalum and lithium and about one quarter of the alumina, zircon, rutile and ilmenite supply.

Bunbury Port has seven berths and throughput was 13.866 million tonnes in 2009/2010, which ranked the Port fourth in Western Australia and eleventh nationally for the tonnage of trade handled. The Port also ranked fourth in the State and thirteenth nationally for value of trade handled. Future growth in the region will depend on the capacity and efficiency of the Bunbury Port.

The Bunbury Port Authority holds 468 hectares of land that surrounds the inner harbour. The land is dissected by the Preston River which currently limits development. Diversion of the river is required to give the Port Authority the capacity to meet future demand by consolidating their land holdings.
Alumina accounts for 70 per cent of the exports from the Bunbury Port. Alumina is railed to the Port from Pinjarra, Wagerup and Worsley on the Perth to Bunbury single track narrow gauge line. The annual alumina freight task is 9.5 million tonnes which causes the section of track between Brunswick Junction (the junction of the Perth-Bunbury and Collie-Bunbury lines), and the Port to be congested and operating at near capacity. Planned plant expansions at Wagerup and Worsley and a coal-to-urea plant near Collie will add another 40 per cent to the annual freight task.

The southern freight component of 2.03 million tonnes is delivered to the port via a road system that contains a mix of heavy and light domestic traffic. Completion of the Bunbury Port Access Road and Bunbury Outer Ring Road will improve the efficiency of these linkages and increase public safety by separating traffic. Upgrades to the Eelup Roundabout, which has the State’s highest rotary accident rate, will complement the planned road efficiency and safety projects.

The Bunbury Port Access Road (PAR) Stage 1, which connects the port to the South Western Highway, was completed in January 2010. Planning for Stage 2 and the Bunbury Outer Ring Road (BORR) Stage 1 is in progress. Funding for both projects (PAR Stage 2 and BORR Stage 1) has been committed by government.

The South West has 2,500 hectares of strategically well placed industrial land available for development at the Kemerton, Shotts and Preston industrial parks. Kemerton is 17 kilometres north of Bunbury and offers an industry core of about 2,106 hectares that is well protected by a 5,437 hectare buffer. Shotts contains 220 hectares, 15 kilometres east of Collie and is well suited for high energy, coal-related heavy industry development. The northern precinct of the Preston Industrial Park (known locally as the Picton Industrial Park) abuts the eastern edge of Bunbury and provides 245 hectares of land that has the potential to host a technology park and general industry development.
To support the region’s productivity growth, an estimated 34 hectares of serviced industrial land will be required per year. Current developed industrial land in the region generates three jobs per hectare. Development of the full complement of industrial land that is available could provide about 7,500 jobs.

The South West region hosts a dynamic economy. Targeted transport infrastructure upgrades will unlock significant port-focused regional growth and assist the region to maintain Gross Regional Product at the decade-long increasing trend of 8.4 per cent annually. The road network covering the Port Access Road, Bunbury Outer Ring Road, Eelup Roundabout, Coalfields Highway, a second railway track from Brunswick to the Port and realignment of the Preston River are inextricably linked catalysts to future economic development.

The total unfunded cost of the infrastructure investment is $623 million, which will realise a net public benefit of $2.6 billion (based on a 7 per cent discount rate over 30 years). Synchronised development of all components identified in the infrastructure package is essential. Untying these linkages will incur an economic cost and adversely affect the potential of the South West to increase future contributions to State and National productivity.

Note: Diversion of the Preston River must precede road and rail upgrades into the port precinct, otherwise significant extra costs will be incurred in building additional bridges.

Bunbury Port Transport Linkages

**Bunbury Port**
The Bunbury Port is a seven-berth deep water facility that services the South West region. Commodities trade through the Port has grown significantly to 13.866 million tonnes in 2009/2010. This represents a 52 per cent increase over the preceding 10 years. Trade is expected to increase by 50 per cent in the next five years and double over the next decade.

**Staged Berth Development**
The Bunbury Port Authority plans to meet future demand through a three-stage berth development program.

**Berth costs and timing ($’million)**

<table>
<thead>
<tr>
<th></th>
<th>2013</th>
<th>2015</th>
<th>2020</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land-back Berth 3 and infrastructure including Berth 5 capacity upgrade</td>
<td>137</td>
<td>137</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Berth 14 - dredge for 2 basins, construct 1 single 300 metre berth</td>
<td></td>
<td>179</td>
<td>179</td>
<td></td>
</tr>
<tr>
<td>Berth 7 – dredge for 2 basins (7 &amp; 9), construct 1 single 300 metre berth</td>
<td>145.5</td>
<td>145.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Container crane</td>
<td>25</td>
<td>25</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Source:** Bunbury Port Authority
**Bunbury Port Structure Plan**

The Bunbury Port Authority has been active in planning for future development and has produced the Bunbury Port Inner Harbour Structure Plan which represents the Port’s future development over the next 20 years.

Key features of the Structure Plan are:

- A planned expansion from 7 berths to 15 berths.
- A significant expansion of the Inner Harbour Basin.
- The diversion of the Preston River to allow for significant land-backed expansion.
- Extensive new road and rail construction to service new and existing berths.

**Figure 1 – Proposed Port Development Plan**

*Source: Bunbury Port Authority*

**Diversion of the Preston River**

The Preston River currently dissects the Bunbury Port Authority’s inner harbour land. In order to create a port with potential for expansion and the capacity to respond quickly and efficiently to proposals for development, diverting the Preston River is essential. Estimated costs for this project are $65 million.
Rail Network

The South West of WA has a significant rail network for the transport of freight and passengers to, from, and within the region.

The rail network centres on Bunbury (at the Picton interchange) and radiates from there to a variety of locations as follows:

- To Bunbury Port in the west via Port Access Corridor, which has been recently upgraded with road access.
- To the Bunbury passenger terminal which provides passenger access for the Australind, a daily service to and from Bunbury-Perth.
- To Manjimup in the south – this line is currently out of service.
- To the metropolitan area via Brunswick Junction in the north – for the Australind passenger service and freight access to Perth and Fremantle Port (also servicing the Alcoa Wagerup alumina refinery).
- To Collie in the east via Brunswick Junction and Worsley – for coal, alumina and caustic soda transport.

Brunswick Junction to Picton

Upgrading the Brunswick Junction to Bunbury Port section of the rail network with a second track is considered the highest priority rail infrastructure project in the region. This is currently the most congested section of the network and is presently operating at or near capacity. Major projects currently under consideration for the region will require access to this section of the network. Consultants for the Department of Transport (Longrun, 2009) have costed this upgrading at $63 million.

The options for a full distance dual track or increasing the length and number of passing loops are currently being investigated to identify the most cost effective solution. Short-train, high frequency movements versus long-train low frequency movements will also be evaluated.

Upgrades to standard gauge have not been factored into evaluations to this point because the existing narrow gauge line can meet demand with upgrades such as concrete sleepering and higher (25 tonne) axle loads.

Kemerton Spur Line

A spur line into the Kemerton Industrial Park from the Bunbury to Perth line, just north of Brunswick Junction, has been planned for some time. The provision of rail access to the Kemerton estate will significantly improve its utility as an efficient strategic industrial area. The cost is estimated to be $20 million and development will depend on new industry in the Kemerton Industrial Park.
Picton to Greenbushes Railway Line
The Picton to Greenbushes railway line is currently out of service and at this point is not supported by a strong business case. Upgrading the railway line is not a priority project in the context of this document.

A future upgrade to the line may provide an alternative for plantation timber and other products to be transported to the Bunbury Port by rail. This could significantly reduce the number of log hauling trucks on the South Western Highway.

In the interim period, the volume of road freight originating from south of Bunbury to the Port significantly strengthens the case for prompt completion of the Bunbury Outer Ring Road (BORR) and the Port Access Road (PAR).

Estimated costs to upgrade the railway are $47 million.

The Road Network
The road network in the South West is extensive. It generally radiates out from Bunbury servicing other regional communities, large areas of discrete land uses, industries and the Perth metropolitan region. Key road links in the network are:

- The Perth-Bunbury Highway which provides a high quality inter-regional highway link between Perth and Bunbury.
- The South Western Highway runs north-south through the agricultural areas of Waroona and Harvey into Bunbury, then south-east to the rural and timber areas of Bridgetown, Manjimup and Walpole in the lower South West.
- The Bussell Highway which provides a major freight and tourist link from central Bunbury to the communities of Busselton, Dunsborough, Margaret River and Augusta.
- The Picton Boyanup Road is a secondary rural road providing access from the Picton industrial area to the rural community of Dardanup and the agricultural and tourism areas of the Ferguson Valley and the Warren Blackwood region.
- The Coalfields Highway extends from the South Western Highway, just north of Bunbury, to Collie. This provides the major regional east-west link that connects with the Albany Highway and carries daily commuter traffic as well as freight and tourist traffic to Collie and the areas of the hinterland.

Recently Funded Road Projects
Two important road investments in the area completed in the past year:

- The New Perth Bunbury Highway (Forrest Highway) was opened in September 2009 and now provides a time saving on the Perth Bunbury road trip by about 20 minutes.
- The Bunbury Port Access Road – Stage 1 was opened in January 2010 and provides a new access road to the Bunbury Port for heavy vehicle traffic from the South Western Highway and the Perth-Bunbury Highway.
### Future Priority Road Projects

Main Roads WA reports that the 2007 traffic volumes on the Coalfields Highway were up to 5,300 vehicles per day and the growth rate over the past 10 years has been around 3 per cent per annum. Growth is expected to remain at a high level due to the ongoing freight transport requirements and the strength of natural resource-based industries in the Collie area. The cost of the necessary upgrades has been estimated to total $49 million.

The Bunbury Outer Ring Road (BORR) links the four major highways that provide access to central Bunbury with the Bunbury Port Access Road (PAR). The BORR and PAR provide a high standard route for traffic to access the Bunbury Port and the developing industrial areas to the east of Bunbury, without the need to travel through the developed residential and commercial areas of Bunbury. The completed BORR will also provide an effective bypass for inter-regional traffic, such as the heavy tourist volumes visiting the Margaret River region during holiday periods.

The BORR is planned as a controlled access highway with the capacity to be upgraded to freeway status over the long term. It will initially be constructed as a four-lane dual carriageway with capacity to be upgraded to freeway status in the long-term.

Planned construction of the BORR and PAR has been staged. Stage 2 of the PAR is a three-kilometre extension of the single carriageway from South Western Highway in Picton to connect with Stage 1 of the BORR. Stage 1 of the BORR covers the construction of four kilometres of roadway from near the Picton Boyanup Road to South Western Highway, including intersections at the Picton Boyanup Road, Port Access Road and South Western Highway.

Main Roads WA (MRWA) has estimated the cost of these stages at $170 million. The Commonwealth Government committed $136 million for Stage 2 of the PAR and BORR Stage 1 during the 2007 election. The WA State Government has agreed to fund the balance.

The balance of the BORR involves a five kilometre highway extension from the Perth-Bunbury Highway near Hines Road to the Picton Boyanup Road, and a nine kilometre highway extension from the South Western Highway to the Bussell Highway. MRWA has advised verbally that this balance of the BORR has an estimated cost in the order of $365 million.

At the present time, inter-regional and port freight traffic in Bunbury mixes with local commuter and tourist traffic. While this was acceptable when traffic volumes were lower, both light and heavy traffic are consistently growing at around 6 per cent per annum and sections of the road network are now becoming congested.
Construction of the BORR and PAR will bring a range of important benefits to domestic, tourist and freight traffic. It will:

- Improve access to the Bunbury Port from industrial locations in the South West.
- Reduce congestion on the existing network.
- Improve travel times and freight efficiency.
- Improve safety for all road users.

**Current Funding**
The 2010/2011 State budget has provided the following funding for port-linked transport infrastructure:

- $4 million towards the upgrade of the Coalfields Highway between the Wellington Dam turn off and Collie, and
- $15.8 million towards land acquisition and pre-construction activities for Stage 1 of the Bunbury Outer Ring Road between the Picton-Boyanup and South Western Highway (south) and Stage 2 of the Bunbury Port Access Road between the South Western Highway and the BORR Stage 1.
- $10 million in 2011/12 for the Coalfields Highway.
- $63 million in 2010-2013 for the Port Access Road.
- $59 million in 2010-2013 for the BORR Stage 1.

**Investment in Stage 2 of the Bunbury Port Access Road is vital.**
Figure 2 - BORR and PAR location map
Land for Industry

The Shotts Industrial Park near Collie, the Kemerton Industrial Park and Preston Industrial Park are significant industrial land assets for the South West and the State. Shotts and Kemerton have the capacity to house major industry and are close to the nearby skilled labour force in Greater Bunbury.

The strategic importance of Kemerton and Shotts is emphasised by a number of factors:

- The value of locating new industry close to the sources of raw materials and with good access to energy and final markets;
- Access to established infrastructure, employees, support industries and contract services, as well as proximity to community services and social infrastructure;
- Synergies between industries – outputs or by-products from one industry become source materials for another;
- Strategic locations close to the Bunbury Port and the Perth-Fremantle hub; and
- The social value of industry in this area in creating employment opportunities for the rapidly growing populations of Bunbury and the hinterland, including Collie.

Kemerton Industrial Park (KIP)

The estate is located 17 kilometres north east of Bunbury and totals some 7,500 hectares in area that comprises:

- 2106 hectares of core industrial land
- 300 hectares of support industrial land
- 5437 hectares of buffer zone

The Kemerton Industrial Park is now home to a number of industries. With the proposed development of key port access infrastructure, Kemerton is strategically well-placed to be a centre for future major industry in the area.

Figure 3 shows the layout of the Kemerton Industrial Park.
Figure 3 - Kemerton Map

Kemerton Substation

Transfield Power Station (peak load)

Goodchilds Abattoir

Water Treatment Plant

Marriott Rd

Nufarm Coogee

Cristal Chemicals

Kemerton Industrial Park

2110ha of industrial core
293ha of support area
5140ha of buffer

Legend:
- Green: Plant Processing Site
- Red: Power Substation
- Blue: Dampier-Bunbury Gas Pipeline
- Purple: KIP Core
- Pink: Boundary of KIP Buffer

This map is intended as a guide only. No business decision should be made on the basis of information shown on this map.
**Shotts**
The Shotts Industrial Park covers about 220 hectares, 12 kilometres east of the township of Collie and provides a base for coal-related industries such as a coal to urea plant and a char plant.

A planned coal to urea plant is a $3.5 billion dollar investment that will require a construction workforce of 1,500 and take two years to build. Production is scheduled to begin in 2013 and will require an operating workforce of 200. The plant will consume about 2.7 million tonnes of coal per annum.

**Figure 4: Shotts Industrial Park layout**

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**Preston Industrial Park**
The Preston Industrial Park contains an area of 2,950 hectares. The park is situated four kilometres east of the Bunbury Central Business District, and is within the municipalities of the City of Bunbury and the Shire of Dardanup. The Preston Industrial Park is bounded by the Perth-Bunbury Highway, the future Bunbury Outer Ring Road and the South Western Highway.

A total of 245 hectares of land in the northern precinct of the Preston Industrial Park has the potential to host a technology park and general industry development.
The Park is well located for general industrial purposes having the South Western Highway and Perth-Bunbury Highway on the north and south boundaries, and the Port Access Corridor on the western boundary. All major services are available. Note: The Preston Industrial Park (northern precinct) is also known as the Picton Industrial Area.

Figure 5 shows the location of the Preston Industrial Park in relation to Bunbury.

**Figure 5: Preston Industrial Estate**

Currently there are 16 industries operating in the Preston Industrial Park (northern precinct), including limestone products manufacturing, warehousing, earthmoving, recycling, distribution of oil products, manufacturing, and processing.

The development is drawing the interest of higher-value industries seeking a site in a well-planned estate with good access to major services, transport linkages and the Bunbury Port.
Future Significant Port-Linked Transport Tasks

Export Coal
Trial shipments of coal are currently exported through the Kwinana Bulk Terminal, but this is not a sustainable long-term proposition. To be sustainable, exports will require rail access from Collie to the Bunbury Port, a dedicated berth and loading facilities. The Bunbury Port Authority advised that the planned initial export rate will be one million tonnes per annum, increasing to two to three million tonnes.

Bauxite and Alumina
The Darling Scarp in the South West currently has four refineries, located at Kwinana, Pinjarra, Wagerup and Worsley. In 2009, these refineries produced in excess of 12 million tonnes of alumina which required the mining of 45 million tonnes of bauxite.

The Bunbury Port exports around 9 million tonnes of alumina and this is likely to increase with the expansion of the Worsley refinery (for completion in 2011) and another refinery being planned in the South West by Bauxite Resources Ltd (BRL). In the next 18 months, BRL is planning to spend $8-$10 million on exploration, specifically on the Southern tenements, to identify and secure access to sufficient resources for future business plans. The primary plan involves the construction of a refinery at Kemerton to export around 1 million tonnes of alumina through the Bunbury Port. A secondary plan to have a direct shipping ore operation will be dependent on a review of the market demand for bauxite.

Mineral Sands
Road transport and current port facilities meet the needs of mineral sands companies.

Woodchips
Woodchips are currently transported to Bunbury Port from plantations in the South West. About 1.2 million tonnes per annum are shipped through Berth 3. Refurbishment of the rail line from Greenbushes may shift some transport of woodchips and logs from road to rail, and reduce the number of heavy vehicles on the South Western Highway.

Electricity
A peak-load power station has recently been constructed and commissioned at Kemerton. In response to the rapidly expanding demands for power for the South West Integrated Network, there are further proposals to expand power generation capacity in Collie and Kemerton.

Plans for the construction of two new power stations at Collie (Bluewaters 3 and 4) and to refurbish, upgrade and recommission the Muja Power Station Stages A and B are in place. Planning has started for the construction of an additional power station at Kemerton.
Containers
Bunbury Port does not operate a container handling facility. Container shipping in Western Australia is confined to Fremantle Port. The Bunbury Port Authority has identified the introduction of container facilities as an important development for the Port.

At present about 30 per cent of containers moved through the Fremantle Port can be attributed to origins and/or destinations in the South West. Development of a South West container facility will reduce economic and social impacts of transporting containers to Fremantle.

At present about **30%** of the containers moved **through** the port of **Fremantle** have **origins in the South West**.
Upgrade freight capacity to Bunbury Port

The most stressed component of infrastructure in the Bunbury-Wellington area is the rail line between Brunswick Junction and Bunbury Port.

One significant capacity constraint for the Port is the location of the Preston River which divides harbour-side land held by the Bunbury Port Authority. Diverting the Preston River is the essential initial step in the transport linkages investment plan to enable final alignments for road, rail and bridge connections to the Port to be set prior to construction. The river diversion is anticipated to cost $65 million.

The river diversion will also open up prospects for a new entrance statement for the City of Bunbury. This could involve the establishment of an historical precinct with the relocation of the historic Leschenault Homestead and the vegetation and landscaping of land along the re-diverted river.
The priority unfunded infrastructure needed to unblock the existing capacity constraints are:

- A second rail line from Brunswick Junction to the Bunbury Port – $63 million. This provides for passenger traffic as well as for the proposed developments in the Collie area.
- Bunbury Outer Ring Road – $365 million.
- Divert the Preston River – $65 million.
- Coalfields Highway - $35 million.
- Eelup Roundabout (fly over) – $95 million.

Common-user infrastructure requirements and their costs are:

- Passing loops on the Brunswick to Worsley line – $15 million.
- Upgrade the rail line from Wagerup to Brunswick Junction – $46 million. The capacity of this line limits future expansion of alumina output, as well as opportunities for coal exports.
- Passing loops on the line between Worsley, Collie and Ewington Junction – $16 million.
- Passing loops between Worsley and Hamilton – $12 million.
- Kemerton rail loops - $20 million.
- General track strengthening and gradient improvements to handle heavy trains on the Brunswick Junction to Ewington line – $20 million.
- Rail loops, unloaders and berth development in the Bunbury Port area – $486.5 million.

The total need is for a $623 million investment in priority infrastructure, and $615.5 million for common-user infrastructure – $129 million for rail, and $486.5 million for Port developments.

The Bureau of Transport Economics and University of Wollongong have conducted analyses of the cost differentials between rail and road transport. They have produced estimates for each of a number of cost components that represent a public benefit – accidents, noise pollution, air pollution, greenhouse gases, congestion (urban areas only) and road maintenance. A report by the Productivity Commission in 2006 gave detailed consideration to differences in external costs for road and rail transport. Its analysis has been used to develop estimates of the differences between road and rail freight in their external costs. These estimates are for noise, accidents, health, greenhouse gases, dust, congestion, and water pollution – and total 3.6 cents a tonne per kilometre for freight through rural areas.
Kemerton Industrial Task

In relation to Kemerton, the current transport task is:

- Coogee Chemicals at Kemerton trucks in 40,000 tonnes of salt from Lake Deborah, about 40 kilometres north of Koolyanobbing. This was transported in containers, brought to Picton by rail and then by road to Kemerton. More recently it has been transported by road.

- Simcoa trucks in 125,000 tonnes of quartz from Moora for its silicon metal production. This is transported by road. Simcoa exports 32,000 tonnes of silicon metal in containers, by road, through Fremantle. Commissioning of a fourth furnace will bring the total output to 64,000 tonnes, and double the transport task.

- Cristal exports 100,000 tonnes of titanium dioxide from their Australind plant, through its facility in Henderson, and then out through Fremantle in containers. Feedstock takes several forms including synthetic rutile from Capel and ilmenite from Cable Sands, which is sourced from either the South West or from South Australia.

- Kemerton Silica Sands exports 500,000 tonnes a year through Bunbury Port. It is transported by road to the Port.

In this analysis, the benefits are estimated for shifting Kemerton-Bunbury transport from road to rail for silica sands, silicon metal, and the bulk feedstocks used in titanium dioxide production. The shift is assumed to occur in 2014. Shifting of any other product to rail would clearly add to the value of benefits. The new infrastructure also has the benefit that it will encourage new industry, which might be considering Kemerton as a base, but is currently concerned at the lack of rail and port access.

Coal is being shipped out of Kwinana on a trial basis. This arrangement is not commercially viable. Long-term exports will only grow if infrastructure at the Bunbury Port is constructed to facilitate planned exports of one million tonnes commencing in 2014 and growing to four million tonnes over four years.

The proposed coal-to-urea plant at Shotts Industrial Park proposes to produce two million tonnes of urea per annum by 2013, with an export value of $850 million annually.

Future bauxite exploration in the South West may, in the long term, lead to alumina processing at Kemerton and the export of alumina. The establishment of an aluminium smelter and an extrusion plant may be considered in the future, but this has not been included in this analysis.

The existing alumina producers have plans to expand their production. The Worsley Efficiency and Growth project could take annual production to 4.6 million tonnes per annum of alumina, an increase of about 1.5 million tonnes. In this analysis, an increase of 1.2 million tonnes has been anticipated.
The benefit of these major projects is estimated as the share of the value of output which is paid as income. This estimate of income includes the payments to local and State governments, and returns to shareholders. It does not include corporate taxes and GST payments, which should be included in principle, as these are too difficult to estimate at even a broad level. Their non-inclusion makes the estimated total of incomes a conservative figure.

The benefit cost analyses are based on the total public funding required for the infrastructure, not just the component of costs which remain unfunded.

**Benefit Cost Analysis of Building the Rail and Port Capacity into Bunbury Port, showing value of benefit over 30 years**

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Annual ($’million)</th>
<th>NPV @ 4% ($’million)</th>
<th>NPV @ 7% ($’million)</th>
<th>NPV @ 10% ($’million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shift existing Kemerton – Bunbury Transport to Rail</td>
<td>15.3</td>
<td>212</td>
<td>146</td>
<td>104</td>
</tr>
<tr>
<td>New industry – urea</td>
<td>85.0</td>
<td>1,295</td>
<td>875</td>
<td>624</td>
</tr>
<tr>
<td>New industry – bauxite</td>
<td>5.0</td>
<td>77</td>
<td>51</td>
<td>35</td>
</tr>
<tr>
<td>New industry – alumina</td>
<td>30.5</td>
<td>469</td>
<td>309</td>
<td>216</td>
</tr>
<tr>
<td>New industry – aluminium</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>New industry – coal exports</td>
<td>40.0</td>
<td>565</td>
<td>361</td>
<td>245</td>
</tr>
<tr>
<td>Industry expansion – alumina</td>
<td>45.0</td>
<td>692</td>
<td>456</td>
<td>319</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>220.8</strong></td>
<td><strong>3,310</strong></td>
<td><strong>2,198</strong></td>
<td><strong>1,543</strong></td>
</tr>
<tr>
<td>BCR – Real costs</td>
<td>19.94</td>
<td>13.24</td>
<td>9.30</td>
<td></td>
</tr>
<tr>
<td>BCR – Discounted costs</td>
<td>21.35</td>
<td>14.88</td>
<td>10.94</td>
<td></td>
</tr>
</tbody>
</table>

* BCR – Benefit Cost Ratio

The construction of this infrastructure also provides for the possibility of increased exports of alumina from existing producers.
Bunbury Outer Ring Road and Eelup Roundabout

The Bunbury Outer Ring Road (BORR) is a major project that has an unfunded cost of $365 million. Stage 1, with a cost of $59 million, is fully funded. The BORR will provide direct access to the Bunbury Port via the Port Access Road. The road is anticipated to be constructed over the six years from 2012 to 2017, subject to the availability of funding.

Passenger journeys on the corridor between Perth and Bunbury are estimated at 4.3 million a year, with 96.5 per cent of these by road. Tourist activity is rapidly increasing and contributing to significant road traffic volumes, particularly at weekends and during holiday periods. The proposed BORR will take some of this tourist and occasional traffic around Bunbury, as well as diverting most of the heavy vehicles that service the Port away from the inner roads.

Eelup Roundabout has been the focus of attention for traffic crashes in the area. It is the highest accident rate roundabout in the State, accounting for 22 per cent of traffic accidents on the roads from Australind through to Bussell Highway over the past five years (which is the area where traffic volumes would be alleviated by the bypass road). The total cost to upgrade the Eelup Roundabout to a grade-separated interchange is in the order of $111 million. A total of $16 million is available for immediate improvements, which is expected to provide adequate crash mitigation and travel efficiencies for at least 10 years.

Based on crash statistics collected by Main Roads WA, and using crash cost calculations from the Commonwealth Government, the cost of traffic accidents on the road through Bunbury from Australind to the Bussell Highway is $5.35 million a year. This includes the cost of vehicle repairs, medical treatment and hospitalisations. Trucks were directly involved in only 4 per cent of these accidents, but the Bunbury office of WA Police comments that trucks were indirectly involved in at least 15 per cent of accidents.

Construction of the BORR and the Eelup Roundabout flyover might be expected to reduce the cost of accidents by an estimated 40 per cent. This would yield an annual benefit of $2.34 million a year in 2010 values, with the actual benefit commencing in 2017 and being fully realised in 2018. The cost of road accidents, or the benefits of reduced accidents, is assumed to grow in line with population growth at 4.23 per cent a year. The benefits of reduced accidents has an estimated Net Present Value (NPV) over 30 years of $72 million (at a discount rate of 4 per cent), $40 million at 7 per cent, and $24 million at 10 per cent.

Road congestion costs exceed the costs of accidents in this area. There are some 11 million traffic movements a year through the Eelup Roundabout, of which about 2 million are through-traffic that would divert onto the BORR. The cost of traffic delays is estimated on the basis of vehicle delay costs, from the Commonwealth BITRE research referred to above. This, for example, values a car hour at $36 and an articulated truck at $71.50 an hour. As with road accidents, the delay times are assumed to rise at the rate of population increase, at 4.23 per cent a year.

1 Bureau of Infrastructure, Transport and Regional Economics (2009). Costs of road crashes in Australia. Research Report No.118. Cost estimates are for regional roads and are based on data for 2006. These have been updated to current values using the Perth CPI.
The total saving is estimated to be worth $43 million a year (2010), with actual benefits starting to be realised from 2017. This benefit has an NPV at 7 per cent discount rate of $529 million.

This analysis yields an NPV for the measurable benefits of the BORR and the Eelup Roundabout flyover totalling $569 million over a period of 30 years, at a discount rate of 7 per cent. This yields a benefit cost ratio of 1.06 if costs are not discounted and 1.81 if they are. The ratio indicates that the projects are well justified considering there are other benefits for tourism and other industries in the area, as well as for pedestrians, motorists and residents in reduced noise, dust and greenhouse pollution, factors that have not been able to be included in this analysis.

### Benefit Cost Analysis of Bunbury Outer Ring Road and Eelup Roundabout flyover
(showing value of the benefit over 30 years, commencing in 2018)

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Annual ($’million) (2018)</th>
<th>NPV @ 4 % ($’million)</th>
<th>NPV @ 7% ($’million)</th>
<th>NPV @ 10% ($’million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved road safety</td>
<td>3.3</td>
<td>72</td>
<td>40</td>
<td>24</td>
</tr>
<tr>
<td>Reduced travel times</td>
<td>43</td>
<td>957</td>
<td>529</td>
<td>313</td>
</tr>
<tr>
<td>Total</td>
<td>46.3</td>
<td>1,029</td>
<td>569</td>
<td>337</td>
</tr>
<tr>
<td>BCR – Real costs</td>
<td>1.92</td>
<td>1.06</td>
<td>0.63</td>
<td></td>
</tr>
<tr>
<td>BCR – Discounted costs</td>
<td>2.95</td>
<td>1.81</td>
<td>1.18</td>
<td>* BCR – Benefit Cost Ratio</td>
</tr>
</tbody>
</table>

Upgrade the Coalfields Highway
An upgrade of the Coalfields Highway is essential. The highway is used extensively for daily commuter traffic between Bunbury and employment in the Collie area. It is also a popular tourism road with visitors travelling to Wellington Dam and beyond. From a commercial point of view, the highway is used to bring in machinery and materials, including over-size items of processing equipment. It serves the farming communities of the hinterland as well as the coal and bauxite industries around Collie.

Main Roads WA has estimated that the costs of essential upgrades to the highway would total $49 million, and could be undertaken over the next four to five years. Note: $14 million has been committed to the Coalfields Highway for 2010-2012.

The main benefits of an upgrade to the highway will be improvements in road safety and reduced traffic delays. The road has a history of almost one fatal crash a year. There are also the benefits that will result from improvements in efficiency of transport operations, and reduced delays because of congestion – especially with heavy loads being transported at low speeds.
The costs of road accidents and traffic time delays on the Coalfields Highway have been calculated from the same sources used for the Bunbury Outer Ring Road and the Eelup Roundabout. The BITRE\(^1\) research produced a cost for a fatal traffic accident in a regional area of WA of $3 million. As well as the costs of fatal accidents, cost estimates include the cost of vehicle repairs, medical treatment and hospitalisations.

Construction of the roadworks could be completed in four to five years subject to environmental approvals for the clearing of some timbered areas near the existing highway. Most expenditure is to be incurred in 2013 and 2014. Improved road safety is estimated to have an annual value in 2010 of $2.88 million, and $3.44 million in 2016. The improvement in road safety is estimated to have a Net Present Value (NPV) over 30 years of $71 million (at a discount rate of 4 per cent), $42 million at 7 per cent, and $26 million at a discount rate of 10 per cent.

The benefits of reduced road congestion costs have been estimated in the same way as for the BORR. While population in the area has been rising at 4.23 per cent a year, rates of increase in the hinterland have been lower than this. It is therefore assumed that for both road accidents and for traffic delays, costs may rise at a rate of 3 per cent a year. The estimated saving in reduced travel delays has been heavily discounted based on Main Roads advice that road improvements will focus mainly on safety aspects. The total saving in travel times is estimated to be $1.2 million a year, commencing in 2016. This benefit generates an NPV of $24 million at 4 per cent discount rate, $14 million at 7 per cent, and $9 million at 10 per cent rate of discount.

This analysis indicates that the measurable benefits of upgrading the Coalfields Highway greatly exceed the costs at conventional discount rates. The project is well justified considering the existence of un-measurable benefits such as reductions in the significant trauma of road deaths and accidents for family and friends of accident victims.

### Benefit Cost Analysis of Upgrades to Coalfields Highway (showing value of the benefit over 30 years, commencing in 2016)

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Annual ($’million) (2016)</th>
<th>NPV @ 4 % ($’million)</th>
<th>NPV @ 7 % ($’million)</th>
<th>NPV @ 10 % ($’million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved road safety</td>
<td>3.44</td>
<td>71</td>
<td>42</td>
<td>26</td>
</tr>
<tr>
<td>Reduced travel times</td>
<td>1.17</td>
<td>24</td>
<td>14</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4.61</strong></td>
<td><strong>95</strong></td>
<td><strong>56</strong></td>
<td><strong>35</strong></td>
</tr>
<tr>
<td>BCR – Real costs</td>
<td>1.94</td>
<td>1.14</td>
<td>0.71</td>
<td></td>
</tr>
<tr>
<td>BCR – Discounted costs</td>
<td>2.13</td>
<td>1.34</td>
<td>0.90</td>
<td></td>
</tr>
</tbody>
</table>

\(^*\) BCR – Benefit Cost Ratio

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\(^1\) Bureau of Infrastructure, Transport and Regional Economics (2009). Costs of road crashes in Australia. Research Report No.118. Cost estimates are for regional roads and are based on data for 2006. These have been updated to current values using the Perth CPI.
**Develop a container handling capacity at Bunbury Port**

The effectiveness of the Bunbury Port could be enhanced by the development of a container handling capacity.

Containers are currently imported and exported through the Fremantle Port. The Fremantle Inner Harbour Container Movement Study in 2005 identified that 24 per cent of export containers and 5 per cent of import containers handled in Fremantle originate in, or are destined for, the South West. Applying these percentages to the current container numbers going through Fremantle (from the Fremantle Port’s Annual Reports) there is an annual movement of 67,000 export containers originating from the South West, and 14,000 import containers going to the region.

In addition, there is a component of the container trade that originates in the South West but is actually containerised in the Fremantle area. For example, Cristal transports its titanium dioxide in palletised bags to Henderson (near Fremantle) where it is then containerised for shipment to overseas markets.

There is the possibility of developing a coastal trade service that would have ships travelling along the WA coast, and a container service at Bunbury would fit in with such a development. There are two types of benefit from the transfer of a share of the container traffic to Bunbury. One is reduced transport costs, which is a private benefit and will be shared between the transporters and producers depending on market forces. The second is the benefit of taking some of the transport off the road system, which yields a public benefit.

The public benefit is estimated on the basis of savings in congestion, fuel and emissions costs. It is assumed that, initially, only 10 per cent of the existing container traffic to and from the South West is redirected through Bunbury, and this has a value of $4 million a year. The current analysis assumes that the share grows progressively to 20 per cent over a period of 20 years, but with no growth in the total container transport task. The NPV is estimated over 30 years from a start of trade in 2014 to total $95 million, at a discount rate of 4 per cent; $60 million at 7 per cent; and $40 million at 10 per cent.

The Bunbury Port Authority has identified that a container crane will not be required until 2020. The cost for the crane (in 2010 dollars) is $25 million.

### Benefit Cost Analysis of Container Handling Capacity at Bunbury Port (showing value of the benefit over 30 years)

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Annual ($’million)</th>
<th>NPV @ 4 % ($’million)</th>
<th>NPV @ 7 % ($’million)</th>
<th>NPV @ 10 % ($’million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Container handling facility</td>
<td>4.0</td>
<td>95</td>
<td>60</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
<td>4.0</td>
<td>95</td>
<td>60</td>
<td>40</td>
</tr>
<tr>
<td>BCR – Real costs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.82</td>
<td>2.40</td>
<td>1.60</td>
<td></td>
</tr>
<tr>
<td>BCR – Discounted costs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.153</td>
<td>2.75</td>
<td>1.94</td>
<td></td>
</tr>
</tbody>
</table>
Summary of benefit cost calculations

The benefit cost analysis is summarised in the following table. It shows a positive benefit cost result, with the overall ratio estimated at 4.6 at a discount rate of 7 per cent.

<table>
<thead>
<tr>
<th>Capital cost ($million)</th>
<th>Total benefit over 30 years (undiscounted $million)</th>
<th>NPV at 4% ($million)</th>
<th>NPV at 7% ($million)</th>
<th>NPV @ 10% ($million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BORR and Eelup roundabout</td>
<td>535</td>
<td>2,569</td>
<td>1,029</td>
<td>569</td>
</tr>
<tr>
<td>Coalfields Highway</td>
<td>49</td>
<td>219</td>
<td>95</td>
<td>56</td>
</tr>
<tr>
<td>Port Container facility</td>
<td>25</td>
<td>200</td>
<td>96</td>
<td>60</td>
</tr>
<tr>
<td>Rail and Port facilities</td>
<td>166</td>
<td>6,434</td>
<td>3,310</td>
<td>2,198</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>775</strong></td>
<td><strong>9,422</strong></td>
<td><strong>4,530</strong></td>
<td><strong>2,883</strong></td>
</tr>
<tr>
<td>BCR – Real costs</td>
<td>12.16</td>
<td>5.85</td>
<td>3.72</td>
<td>2.52</td>
</tr>
<tr>
<td>BCR – Discounted costs</td>
<td>7.93</td>
<td>5.49</td>
<td>4.03</td>
<td></td>
</tr>
</tbody>
</table>

* BCR – Benefit Cost Ratio

Benefits and costs

The objective of this section is to provide estimates of the flows of benefits and costs over the period of the next 30 years. The analysis is in two parts. The first deals with the direct costs and direct benefits of the infrastructure package; the second illustrates the wider economic impacts of the projects on the economies of the South West region and the State.

Benefits and costs have been separately identified for road, rail and port construction. In reality, this level of separation may be a little artificial because some of the benefits from improved port operations, for example, depend on improvements to roads.

The road improvements from the earlier report comprise the Bunbury Outer Ring Road (BORR), Port Access Road (PAR), the Eelup Roundabout, and the Coalfields Highway upgrade.
The flows of benefits and costs from these road improvements are shown in Figure 6.

**Figure 6: Public Benefits and Costs of Road Improvements, over 30 years**

Figure 6 illustrates that costs of road construction are clustered over the next seven years and the benefits begin to accrue from 2016. Costs peak at $167 million in 2015. Benefits grow into the future because these are driven by population growth which is assumed to be 4.23 per cent a year in Bunbury and 3 per cent in the hinterland. There is no inflation in these figures or discounting of future financial flows, as would be normal in a return on investment analysis.

The net benefits of the investment in road infrastructure are shown by the continuous line. It shows the accumulated net benefit over time, which goes to an accumulated net deficit of $551 million in 2016, and returning to a net zero by 2025 – which is the undiscounted pay-back period.

The graph illustrates public costs of road construction, public benefits of reduced traffic congestion and reduced road accident trauma only. It does not include the private benefits flowing from increased industry opportunities – for example, increased tourism because of reduced travel times and improved opportunities for industry because of reduced transport costs and travel times.

Over the course of 30 years the net accumulated benefits are $1,375 million.
Figure 7 shows a similar positive return of public benefits from an investment in rail and port infrastructure.

**Figure 7: Public Benefits and Costs of Rail and Port Investments, over 30 years**

Public costs of rail and port investment are assumed to be incurred over a period of five years, with the benefits beginning to accrue in the third year (2012) and growing to a level of $199 million a year. The value of benefits, as shown in Figure 7, reaches a plateau. This is unlike the benefits flowing from investments in road infrastructure which have a natural growth factor.

Benefits of rail and port investments will grow over time with growth in industry, and changes such as development of the Port as a significant container port (rather than the relatively small throughput assumed in this analysis). However, the emergence of new industry and new growth opportunities for existing industry are unpredictable and such changes have not been included in the current analysis.

The net public benefits of investments in rail and port show a relatively short pay-back period, so that by 2015 the accumulated net benefits have become positive.
Figure 8 shows the sum of benefits and costs for both road and rail and port investments. It is the summation of Figures 6 and 7.

**Figure 8: Public Benefits and Costs of Road, Rail and Port Investments, over 30 years**

Figure 9 shows an analysis of the economic impact of the infrastructure projects. The economic impact is the sum of the impact of the construction phases of the projects plus the impact of the ongoing economic output that is made possible by the projects. The impact is greatest during the intense construction phases and then settles to a constant level once all of the anticipated projects have reached the maximum of their expected levels of output.

**Figure 9: Economic Impacts of Infrastructure Projects ($’ millions)**
The ‘direct’ effect is the actual levels of economic activity involved in the construction of the infrastructure, or produced when the projects are operational. The ‘region’ effect is the estimated value of economic activity that will be generated in the South West region, including local multiplier effects. The ‘State’ effect is an estimate of the value of economic activity that will be generated across the whole of WA.

The ‘direct’ effect reaches a maximum in 2013, at $1,823 million, coinciding with the anticipated peak of the construction activity. Following the completion of construction, the level of output from the projects settles at a level of $1,093 million a year. For the South West region there is a peak in additional economic activity in 2013, at $3,580 million a year and then the annual economic impact settles back to a level of $1,647 million a year.

**Implementation Schedule**

The benefits start to flow when almost all projects have been completed – they are a package of improvements.

The anticipated timing for each of the infrastructure components is as follows, and assumes that all components will be fully funded:

- **Duplication of the Brunswick Junction/Bunbury Port Rail Line** – a four year approvals and construction program. Similar timing is expected for other rail works.
- **Bunbury Outer Ring Road** – Stage 1 is currently programmed for completion in 2013. Planned completion for Stage 2 is 2017.
- **Diversion of the Preston River** – A three and half year approvals and construction program, involving one and half years planning and design, and two years construction.
- **Eelup Roundabout** – preliminary upgrade is planned to be completed by 2014.
- **Port Access Road (Stage 2)** – 2014.
- **Coalfields Highway** – Stage 1 to be completed by 2012, and Stage 2 by 2016.
### Project costs and indicative program (2009/10 dollars) $’million

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Brunswick-Port Railway</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>63</td>
</tr>
<tr>
<td>Bunbury Outer Ring Road – Stage 1</td>
<td>8</td>
<td>22</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>59</td>
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<tr>
<td>Bunbury Outer Ring Road – Stages 2 &amp; 3</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>15.2</td>
<td>54</td>
<td>89</td>
<td>119.6</td>
</tr>
<tr>
<td>Preston River Diversion</td>
<td>7</td>
<td>11</td>
<td>14</td>
<td>23</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td>65</td>
</tr>
<tr>
<td>Port Access Road – Stage 2</td>
<td>8</td>
<td>27</td>
<td>27</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>63</td>
</tr>
<tr>
<td>Eelup Roundabout</td>
<td>0.5</td>
<td>3</td>
<td>7</td>
<td>5.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>Eelup Grade Separated Interchange</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>45</td>
<td>45</td>
<td>95</td>
</tr>
<tr>
<td>Coalfields Highway – Stage 1</td>
<td>4</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>Coalfields Highway – Stage 2</td>
<td></td>
<td></td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>2</td>
<td></td>
<td></td>
<td>35</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>27.5</strong></td>
<td><strong>99</strong></td>
<td><strong>128.2</strong></td>
<td><strong>105.5</strong></td>
<td><strong>116</strong></td>
<td><strong>166.6</strong></td>
<td><strong>127.5</strong></td>
<td><strong>4.7</strong></td>
<td><strong>775</strong></td>
</tr>
</tbody>
</table>
The capacity of the existing rail and road transport infrastructure is being fully utilised.

The population and industry in the Bunbury and Collie areas (Bunbury-Wellington) have been growing at above State and National rates over the past decade. There are real prospects that this rate of development will accelerate with major projects at advanced stages of consideration in bauxite mining, alumina production, urea production, energy generation, and coal exports. There are also plans for expansion of existing industries at Kemerton.

The capacity of the existing rail and road transport infrastructure is being fully utilised. Major new projects will be dependant on a steep increase in transport capacity, mainly for materials being sent to export but also for raw materials, machinery and components needed in construction and operations being imported. The road and rail upgrades will also provide more efficient and safer routes for commuting workers and service providers.

The Bunbury Port is similarly constrained. It is an efficient port operation but will require a major expansion if it is to offer the efficient bulk loading services essential to the new projects.

Development of transport, handling and port infrastructure will also deliver a boost to existing industry and businesses. The option to transfer freight from road to rail will bring handling economies for business, as well as community benefits in terms of reduced congestion, pollution and improved road safety.
This current analysis concludes that the priority infrastructure needed to unblock the existing capacity constraints should be regarded as an interlocking package. Leaving any component out will severely compromise the total potential benefit.

The analysis also concludes that there is a strong economic case for government funding for the infrastructure projects. The private sector will have a significant contribution to make to those infrastructure components that are specific to their individual needs. This submission deals only with those forms of infrastructure for which government funding can be justified.

The total unfunded cost of the infrastructure identified in this submission as needed, and for which funding is required, is $623 million over a period of eight years.

The benefit cost analysis concludes that this investment will yield a strong return to the wider community.

### Unfunded Infrastructure Costs, by item (2009/10 dollars)

<table>
<thead>
<tr>
<th>Infrastructure item</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brunswick-Port railway</td>
<td>63</td>
</tr>
<tr>
<td>Bunbury Outer Ring Road</td>
<td>365</td>
</tr>
<tr>
<td>Preston River diversion</td>
<td>65</td>
</tr>
<tr>
<td>Eelup roundabout</td>
<td>95</td>
</tr>
<tr>
<td>Coalfields Highway</td>
<td>35</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>623</strong></td>
</tr>
</tbody>
</table>

**Where to from here**

The Roads to Export Alliance partners will now work with industry, State and Federal departments to undertake detailed financial and project business planning. Achieving the outcomes identified in this document will be a significant task which will require open communication and commitment from all stakeholders.
The initiative of the South West Development Commission, with support from the Bunbury Port Authority, Bunbury Wellington Economic Alliance and The Chamber of Minerals & Energy WA and the professional input of Economics Consulting Services, has produced a compelling economic overview and business case for investment in infrastructure in the South West region of Western Australia.

Prima facie, the quantum of outstanding investment is high at $623 million. However, the economic analysis shows a benefit cost ratio of 3.9 at a discount rate of 7 per cent, which confirms the investment proposal has a very strong economic base and a positive return.

This document is derived from the detailed submission that was lodged with Infrastructure Australia on 29 October 2009 and has been redesigned to inform the public of the infrastructure shortcomings that are hidden by the bright economic forecast for the South West.

Public support for the Infrastructure Investment Plan is essential to show that the community, business and industry sectors are informed, and are willing to advocate for the investment needed for the South West to continue the strong trends in economic growth and productivity.

The South West Development Commission, Bunbury Port Authority, Bunbury Wellington Economic Alliance and The Chamber of Minerals & Energy WA look forward to working with you to win the investment that will build the transport infrastructure to support the South West’s strong economic future.
For more information contact:

**Don Punch**  Chief Executive Officer  
South West Development Commission  
T: 9792 2000  |  E: don.punch@swdc.wa.gov.au

**Kevin Schellack**  Chief Executive Officer  
Bunbury Port Authority  
T: 9729 7020  |  E: kevin.schellack@byport.com.au

**Matt Granger**  Chief Executive Officer  
Bunbury Wellington Economic Alliance  
T: 9734 2923  |  E: ceo@bwea.com.au