

DRAFT SOUTH WEST SUPPLY CHAIN STRATEGY



MINISTER'S FOREWORD

Western Australia's freight supply chains are the backbone of our import and export industries and are essential for the future growth of our economy.

Each region has unique supply chains to support the movement of goods between the region and the rest of WA, Australia and the global market.

While the South West region of WA may be best known for tourism, wineries and beaches, the region also plays an integral role in our State's economy as it handles large volumes of bulk exports associated with mining, agriculture and forestry. The greater Bunbury area, including Bunbury Port, is an important hub for many of the South West's supply chains.

Mining accounts for a large portion of South West exports. Alumina is the largest export from the region comprising 73 per cent of exports by tonne from Bunbury Port. The Talison Lithium Mine, located in the South West near Greenbushes, produces around 30 per cent of the world's lithium.

Increasing demand for imports due to population growth, combined with increasing export volumes from mining, industrial and agricultural activity, will result in growing pressure on the region's transport network capacity.

Ensuring our freight supply chains are keeping up with increasing demand in the South West region is crucial to the future growth of our economy.

The South West Supply Chain Strategy (the Strategy) has been drafted to respond to the future requirements of the freight network, balancing the needs of the community with those of industry, to ensure a safe, efficient and future-ready freight transport network.

The key challenges facing the existing freight network and proposed responses are outlined in the Strategy. The recommended initiatives aim to meet the objectives of connected and continuous supply chains, seamless modal integration, optimised infrastructure and policy, regional economic growth, and improved efficiency and road safety.

The Strategy identifies future road, rail, air and port infrastructure requirements based on current network constraints and predicted future freight volume in the South West region, based on research, supply chain mapping and stakeholder consultation.

The infrastructure improvements and process enhancements detailed in the Strategy aim to facilitate improved and sustainable freight productivity and help to best position the South West's supply chains for growth.

The key initiatives and responses in the Strategy will require close collaboration between state agencies, including the Southern Ports Authority, the Commonwealth and industry to ensure future opportunities for growth are realised.

Strategies and previous studies that have helped provide context and inform the draft *South West Supply Chain Strategy* include the *Revitalising Agricultural Region Freight Strategy* (RARF Strategy), the *Bunbury* – *Geographe Sub-Regional Strategy and the Westport: Port and Environs Strategy*. In particular, this Strategy complements the RARF Strategy, which is co-released with this Strategy. The Strategy has a 10 to 15 year timeframe and establishes a framework and direction for future freight transport related investment.

Public comment on the draft Strategy is welcome and I encourage industry, local government and residents to have their say to help shape future transport supply chains in the South West region.



The Hon. Rita Saffioti MP Western Australia Minister for Transport

EXECUTIVE SUMMARY

The South West Supply Chain Strategy identifies and prioritises future road, rail, air and port infrastructure requirements in the South West region. It is based on existing constraints on the networks and the projected increased freight volumes and movement that arise through growth in population, mining, industrial and agricultural activity.

The South West Supply Chain Strategy (the Strategy) identifies the core issues underlying movement of high volume and high value freight over the next 10-15 years. It also identifies infrastructure and non-infrastructure priorities to improve supply chain efficiency in the South West region.

The Strategy focuses on supply chains that originate or terminate in the South West region, as shown in Figure 1. Most supply chains in the South West centre around Bunbury Port, which handles large volumes of bulk imports and exports associated with mining, agriculture and forestry.

The dispersed catchment of the Port means that products travel to the port from regions as far away as Perth, Peel and the Wheatbelt. This document focuses on the challenges and responses specific to the South West area.

While the Strategy recognises the need to adopt a triple bottom line approach in developing infrastructure proposals, this is a strategic document with a primary focus on freight supply chains and does not include detailed discussion of specific costs and benefits of individual projects.

The Strategy is not linked to specific funding commitments around its proposals but is focused on the challenges and opportunities for the South West supply chain for the next 10-15 years.

The Strategy is the result of research and targeted stakeholder consultation aimed at identifying deficiencies and opportunities in transport infrastructure or the policy and regulatory framework.



FIGURE 1: SOUTH WEST REGION

The Strategy focuses on the following key supply chains:



The Strategy has six key

objectives:



The Strategy identifies the key challenges and responses to these, as detailed in the snapshot below.

	KEY CHALLENGES		KEY RESPONSES
1	Co-ordination and prioritisation of available infrastructure funding remains a significant challenge for local governments, State Government and the private sector.		Identify, prioritise and coordinate infrastructure improvements across government and the private sector.
2	The South West freight rail network is approaching operational capacity at strategic locations. Further growth in demand will be difficult to accommodate without key investment along the corridor.	•	Rail infrastructure managers to collaborate on business cases for corridor update works.
3	Freight rail infrastructure connecting bulk exporters to Bunbury Port does not meet the needs of all users. Potential growth in bulk exports is also constrained by railway connectivity to the berths at Bunbury Port.	•	Reconfiguration of road and rail access to Bunbury Port will reduce landside costs for current and future exporters.
4	There is no container rail service currently available for the movement of general and containerised freight between the South West and broader export and domestic markets.		Facilitate the re-establishment of container rail services between Bunbury and Perth.
5	Limitations on the Restricted Access Vehicles (RAV) network reduces transport efficiency south of Bunbury with impacts on freight costs and increases the total number of truck journeys.		Targeted road investment, including strategic RAV upgrades, will improve freight efficiency and minimise supply chain costs.
6	Road safety remains a major concern in the South West where high volumes of freight, local and tourist traffic interact.	•	Strategic town bypasses to separate freight and commuters from local traffic. Ongoing improvements to the road network will benefit road safety and the interaction between general and freight traffic. Grade separation of road and rail infrastructure.
7	Air freight services for high value goods are constrained by the lack of dedicated freight services and the limited number of commercial passenger flights from the Busselton Margaret River Airport.		Encourage the long-term growth of air freight out of the Busselton Margaret River Airport as new export markets develop.

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PART ONE: REGIONAL CONTEXT

The South West region covers an area of approximately 24,000 square kilometres and is the second most populous region of Western Australia.

More than 178,000 people currently reside in the South West with the population forecast to reach 226,000 by 2031¹. The South West is also a popular tourist destination drawing visitors to the wineries, beaches, national parks and caves. The region is part of the Southwest Australian Ecoregion, one of 34 internationally recognised biodiversity hotspots.

Bunbury is the commercial and administrative hub of the South West region, which contains mineral deposits, productive soils for agriculture, and strong manufacturing, retail and tourism industries.

Mining is one of the South West's largest revenue earners, with alumina, mineral sands and lithium being the main contributors. Major employers in the region include construction, retail trade, health care and social assistance industries, each of which employ more than 10 per cent of the total 83,902 jobs in the region in 2018².

In 2018, the South West generated a gross regional product of \$13.48 billion, equating to 14 per cent of regional Western Australia's gross domestic product, see Figure 2³.

The South West is separated into three subregions which include Bunbury-Geographe, Warren-Blackwood and Leeuwin-Naturaliste.



FIGURE 2: GROSS REGIONAL PRODUCT

The South West is separated into three subregions which include Bunbury-Geographe, Warren-Blackwood and Leeuwin-Naturaliste.

39%	Pilbara			
15%	Goldfields-Esperance			
14%	South West			
9%	Peel			
8%	Mid West			
7%	Wheatbelt			
4%	Great Southern			
3%	Kimberley			
1%	Gascoyne			

RAIL, ROAD AND AIR FREIGHT NETWORKS

The South West region benefits from efficient freight connections to Bunbury Port and to the Perth metropolitan area. Bunbury Port, which is managed by the Southern Ports Authority, is serviced by the South West Main Line, a high-quality narrow-gauge rail line accommodating 21 tonne axle loads, which transports over 12 million⁴ tonnes of bulk product every year between the port and alumina refineries in Pinjarra, Wagerup and Worsley. The South West Main Line also provides access to Kwinana for bulk exports and to the container port in Fremantle.

Rail operations are complemented by an extensive network of State roads, which connect producers and industrial areas with export facilities at Bunbury Port and within the Perth metropolitan area. Restricted Access Vehicles (RAVs) are permitted on the network in compliance with specified limits on vehicle dimensions and Gross Vehicle Mass (GVM). Forrest Highway accommodates 36.5 metre road trains, or RAV 7 between Bunbury and Perth, while the remainder of the South West is typically limited to 27.5 metre vehicles, or RAV 4. Coalfields Highway, an important freight route, permits RAV 7 vehicles, although limitations on laden descent of Roelands Hill can restrict the westward movement of goods to smaller vehicle combinations. A select number of operators are permitted to use 42 metre Performance Based Standards (PBS) vehicles on Forrest Highway, with other roads permitting up to 30 metre PBS vehicles. The utilisation of PBS vehicles allows operators to carry larger loads than the equivalent RAV standard, which improves freight efficiency and reduces vehicle trips.

Road freight interacts with significant volumes of general traffic including the large number of local, interstate and international tourists visiting the South West region. Expansion of the Busselton Margaret River Airport operations is likely to further boost the number of interstate and international visitors that travel to the to the region as well as provide passenger aircraft underbelly freight opportunities for local producers.



INDUSTRIAL LAND AND DEVELOPMENT

Kemerton Strategic Industrial Area

Located 17 kilometres north-east of Bunbury, this area is intended to support heavy industry and resource processing for the South West. The industrial area has a number of existing tenants within the 2,025 hectare industrial core and 293 hectare area for support industries. Kemerton also benefits from having a buffer area of over 5,000 hectares⁵.

Shotts Strategic Industrial Area

Located 7.5 kilometres east of Collie, this precinct has a developable area of 210 hectares over five development sites that are available on long-term lease agreements⁶.

Waterloo Industrial Park District Structure Plan

The future industrial park is located between 10 and 14 kilometres from Bunbury Port and has a total developable area of 1,356 hectares⁷. It is directly south of the largely residential Wanju District Structure Plan area which may become a local workforce source for the 4,000 new jobs that the industrial park is predicted to generate. Future businesses within the industrial park will also benefit from its proximity to major freight routes including the Bunbury Outer Ring Road (BORR), Willinge Drive and Forrest Highway.

A six-hectare site within the Waterloo structure plan area, adjacent to the freight rail line, has been earmarked for the development of rail related industries, which could include a rail siding and an intermodal terminal.

The Waterloo Industrial District Structure Plan was adopted by the Western Australian Planning Commission (WAPC) in October 2019, allowing for regional and local planning scheme amendments to be progressed, as well as local structure plans and development approval.

Additional industrial land available for development near Bunbury includes the 271-hectare Preston Industrial Park (northern precinct)⁸, 548-hectare Picton Industrial Park (southern precinct)⁹ and land within the Bunbury Port boundaries, outlined in Figure 3.



FIGURE 3: KEY INDUSTRIAL LANDS IN GREATER BUNBURY AREA



SOUTH WEST SUPPLY CHAIN STRATEGY



BUNBURY PORT

The Southern Ports Authority is a Government Trading Enterprise (GTE), responsible for the management of the ports of Bunbury, Albany and Esperance.

Bunbury Port has a total landholding of 474 hectares, of which only 13.3 per cent is currently occupied by port-related activity¹⁰. There is significant potential for the future expansion of the Port, as proposed in the Revised Inner Harbour Structure Plan.

The Port has good transport connections, with access to the freight rail line and a new port access road, Willinge Drive, completed in 2013. The completion of the northern and southern sections of the Bunbury Outer Ring Road (BORR), future grade separation of Willinge Drive over the South Western Highway and South West Main Rail Line and the future upgrade of Bussell Highway to a dual carriageway between Bunbury and Busselton will further improve freight access into the Port.

In the 2018/2019 financial year, approximately 14.7 million tonnes of bulk product was exported through Bunbury Port.

Over 70 per cent of export tonnage was alumina, 10 per cent woodchips, 5 per cent spodumene and 5 per cent mineral sands. The largest import through Bunbury Port in the same year was 1.4 million tonnes of caustic soda, which is used to refine bauxite into alumina. Major import and export supply chains are shown in Figure 4 and 5.



FIGURE 4: IMPORTS - BY TONNAGE PER ANNUM¹¹



Bunge (Arthur River)

PART TWO: STRATEGIC CONTEXT

Several strategies and previous studies have provided context and helped inform this Strategy. Details of those relevant to WA are provided below.

Bunbury-Geographe Sub Regional Strategy

The Department of Planning, Lands and Heritage has been directed by the WAPC to prepare a sub-regional strategy for Bunbury Geographe. The Strategy is centred on the long-term development of greater Bunbury, including the largely residential district structure plan for Wanju which is located directly north of the industrial district structure plan for Waterloo. The Strategy will also cover strategic transport infrastructure such as the Bunbury Outer Ring Road, Bunbury Port, the potential for fast passenger rail between Perth and the South West region, and upgrades to, or expansion of, the freight rail network.

Westport: Port and Environs Strategy

The Westport Taskforce was formed to develop a plan to manage WA's growing freight demands for the next 50 years and beyond. Westport's studies have focused on the road and rail networks and port infrastructure needed for a holistic, long-term solution for the WA's future freight task. The future port locations that were initially considered by Westport included Fremantle, Kwinana and Bunbury. In August 2019, Westport released a shortlist of future port options, none of which included a role for Bunbury Port in handing containers. Bunbury's key limitation is its distance from the Perth metropolitan region, where most containers are unpacked for distribution and consumption.

High infrastructure costs, including dredging the harbour to accommodate container ships and duplicating the South West Main Line, were additional constraints on a future container port at Bunbury.

Revitalising Agricultural Regional Freight Strategy

The Strategy identifies and prioritises specific infrastructure upgrades, and suggests regulatory and policy measures that will help make freight transport in WA's agricultural regions more productive, efficient and safer. The Strategy was released for public comment in mid-2019 and the final co-released with this Strategy. The Strategy's geographic scope includes the Mid West, Wheatbelt, Great Southern and Goldfields-Esperance regions. Perth, Peel and the South West were excluded from the Strategy since these were subject to separate investigation by the Westport Taskforce.

Collie Futures Fund

The State Government is providing \$20 million of funding over five years to encourage economic diversification and create jobs in the Collie area. The fund is being delivered through two key programs; the Small Grants Program administered by the South West Development Commission and the Industry Development Fund administered by the Department of Jobs, Tourism, Science and Innovation

Revised Inner Harbour Structure Plan

The draft plan, being developed by the Southern Ports Authority, establishes new opportunities for the Bunbury Port. The cost-effective phased expansion will increase throughput capacity over the medium to long-term.

PART THREE: EXISTING SUPPLY CHAINS

Bunbury Port is a bulk exports port, used predominantly for the shipping of alumina which is transported by rail from three alumina refineries located in Wagerup, Pinjarra and Worsley.

Woodchips are another prominent export, with two woodchip exporters sourcing their logs from plantations throughout the region. Around half of woodchip exports are chipped outside the Port, while the remaining logs are chipped at the Port prior to export. Logs and woodchips are transported on the road network, with the main routes being South Western, Vasse and Bussell highways and Sues Road.

The third largest export in the South West is spodumene, which is mined near Greenbushes and currently trucked into the Port for export. Mineral sands are trucked to Bunbury Port from various locations within the South West region and from as far north as the Perth region. Other exports can be viewed in Figure 6.

The Fremantle Inner Harbour and Esperance Port are the only ports in Western Australia with container handling capabilities, therefore all South West containerised freight for export is transported by truck to Fremantle.

Most of the freight for interstate markets, which is also transported by road, is taken to the Kewdale Interstate Rail Terminal where it is transferred onto rail.

FIGURE 6: EXPORTS FROM BUNBURY PORT BY PERCENT OF TOTAL VOLUME¹³

While the agricultural industry in the South West does not generate the same significant volumes of freight produced by mining, this sector does play an important role in the regional economy and providing fresh produce to residents throughout Western Australia. Higher value food and beverage processing, as well as cold storage and containerisation, are growth opportunities for this industry.

73 [%] Alumina
10 [%] Woodchips
5% Spodumene
4 [%] Mineral Sands
3% Other
2 [%] Grain
3 [%] Silica Sand



- Australia is the world's largest producer of bauxite.
- Australia is the second largest producer of alumina (17 per cent), with WA's exports accounting for around 30 per cent of Australia's alumina production.
- The industry has become less vertically integrated in recent years, with increasing amounts of bauxite exported as direct shipping ore.
- Six to seven tonnes of bauxite is required to produce two tonnes of alumina and one tonne of aluminium metal.
- Pressure on the viability of east coast Australian aluminium smelters could affect global production and freight patterns of WA alumina.

MAJOR PLAYERS

Alcoa of Australia, Worsley Alumina (South32)

ANNUAL EXPORT VOLUME (BUNBURY) 2018-2019 FY

10.8 million tonnes of alumina

COMMODITY ORIGIN

Alcoa of Australia (Pinjarra and Wagerup refineries) Worsley Alumina (South32)

COMMODITY DESTINATION (LOCAL)

Kwinana Bulk Jetty (Fremantle Outer Harbour), Bunbury Port

PRIMARY TRANSPORT METHOD

Overland conveyor systems (bauxite mine to refinery) and rail (mine and refinery to port)

FUTURE GROWTH EXPECTATIONS

Stable – alumina producers in WA are amongst the lowest costs producers in the world and WA's bauxite reserves are estimated to be able to sustain more than 50 years of alumina production at current levels.

- Any future increase in bauxite exports through Bunbury Port would require new facilities to be built at the Port.
- Increased bauxite volumes on rail may provide the opportunity to fund corridor capacity improvements, for the benefit of all rail users.





- WA's forestry industry includes wood and fibre production from native forest, hardwood and softwood plantations, as well as the processing of timber imported from other states and internationally.
- Logs are then processed into primary products such as sawn timber, woodchips, pulp and paper.

MAJOR PLAYERS

WA Plantation Resources (Marubeni), Bunbury Fibre Exports (Mitsui)

ANNUAL EXPORT VOLUME (BUNBURY) 2018-2019 FY

1,467,166 tonnes

COMMODITY ORIGIN

Scattered throughout the South West region

COMMODITY DESTINATION (LOCAL)

Bunbury Port - the two woodchip facilities are located at the Port

COMMODITY DESTINATION (EXPORT)

Japan and China

PRIMARY TRANSPORT METHOD

Road – timber trucks predominantly use Boyup Brook/Donnybrook Road, South Western Highway, Brockman Highway/Sues Road and Bussell Highway

FUTURE GROWTH EXPECTATIONS

Stable/modest decline – plantations are not being replaced at a rate sufficient to maintain current harvest levels

- Reinstatement of the Picton to Greenbushes rail line and improved connectivity at Bunbury Port may attract some timber onto rail. This would reduce timber trucks on South Western Highway.
- Relocation of one of the woodchip exporters from the northern side to the southern side of the Inner Harbour could attract new mineral storage shed investment on the northern side and optimise the existing mineral exporter supply chains.





- Mineral sands are within a class of ore deposits that contain heavy minerals such as ilmenite, zircon, leucoxene, and rutile.
- ▶ Major markets are Japan, China, the UK, Saudi Arabia, the US and the Netherlands.

MAJOR PLAYERS

Kemerton Silica Sands, Iluka, Tronox, Doral

ANNUAL EXPORT VOLUME (BUNBURY) 2018-2019 FY

976,827 tonnes

COMMODITY ORIGIN

Kemerton Silica Sands – northern boundary of the Kemerton Industrial Park

Iluka – located in Capel with product trucked from Cataby north of Perth and imported via Bunbury Port from South Australia for processing prior to export

Tronox - Wonnerup Project - located on Sues Road approximately 10 kilometres east of Busselton and from the Chandala processing plant north of Perth

Doral - Yoongarillup mine located near Busselton and the Keysbrook Mine transported via road to Picton where the mineral separation plant is located

COMMODITY DESTINATION (LOCAL)

Bunbury Port

PRIMARY TRANSPORT METHOD

All road transport

FUTURE GROWTH EXPECTATIONS

High – growth opportunities for mineral sands in WA, although export port will be dependent on mine location and commercial decisions. Kwinana may handle the volumes of new producers, unless the producer has a processing plant in the Bunbury area.

- Investigate the potential to establish a rail supply chain for transporting mineral sands from north of the Perth Metropolitan Area to processing facilities in the South West and/or export through Bunbury Port.
- A new intermodal terminal (IMT) in the South West could attract containerised mineral sands exports onto rail.





- The Talison Lithium mine located in Greenbushes produces approximately 30 per cent of the world's lithium from mineral spodumene.
- Demand for lithium is largely being driven by the increasing use of rechargeable batteries.

MAJOR PLAYERS

Talison Lithium, Albemarle Corporation, Tianqi Lithium

ANNUAL EXPORT VOLUME (BUNBURY)

2018-2019 FY

767,000 tonnes (spodumene)

COMMODITY ORIGIN

Greenbushes Mine

COMMODITY DESTINATION (LOCAL)

Bunbury Port; Kemerton; and Kwinana

PRIMARY TRANSPORT METHOD

Road (predominantly South Western Highway) although a rail feasibility study has been prepared and a more detailed business case is expected in early 2021

FUTURE GROWTH EXPECTATIONS

High – global future demand is difficult to forecast, although most projections are positive. The Greenbushes mine is the biggest operating lithium mine in the world and has probable mineral ore reserves estimated to be around 60Mt

- The reinstatement of the Greenbushes Rail Line relies on ore production volumes reaching approximately two million tonnes per annum.
- Modifications at Bunbury Port would also be required to support a rail supply chain for lithium ore. This may include improved rail connectivity, additional access roads and creating space for rail discharge facilities by relocating existing tenants.
- If this is achieved, other commodities such as forestry products and fresh produce may be attracted to rail transport which would lead to a reduction in road freight traffic on South Western Highway.
- A rail spur from the South West Main Line into the Kemerton Strategic Industrial Area (location of Albemarle processing plant) has been investigated and will require costly grade separations.





- Bunge receival sites, located at Arthur River and Kukerin, receive wheat, barley, canola and oats from surrounding growers.
- CBH Group is the other major grain exporter although they have a limited presence in the South West region and do not export from Bunbury Port.

MAJOR PLAYERS

Bunge

ANNUAL EXPORT VOLUME (BUNBURY)

2018-2019 FY

311,655 tonnes

COMMODITY ORIGIN

Dispersed throughout the region – Bunge receival sites located at Arthur River and Kukerin (Wheatbelt)

COMMODITY DESTINATION (LOCAL)

Bunge Bunbury Port Grain Terminal

PRIMARY TRANSPORT METHOD

Road transport - Coalfields Highway from Arthur River to Bunbury Port

FUTURE GROWTH EXPECTATIONS

Stable – export volumes expected to fluctuate due to agronomic factors

- The routes used by trucks from farms to Bunge grain silos (Kukerin and Arthur River) and on to Bunbury Port are heavily utilised during harvest. Local and State Government road maintenance strategies should be focused on these routes.
- Vehicle combination types are limited by the restrictions on Coalfields Highway at Roelands Hill.





COPPER CONCENTRATE (GOLD RICH)

INDUSTRY SNAPSHOT

- Copper concentrate, which also contains gold, is mined near Boddington, within the Peel region.
- ▶ The final concentrate is thickened and filtered and then trucked to Bunbury Port.
- The concentrate typically contains between 15 and 20 per cent copper and 60 to 100 grams of gold per tonne.

MAJOR PLAYERS

Newmont Goldcorp

ANNUAL EXPORT VOLUME (BUNBURY)

2018-2019 FY

190,361 tonnes

COMMODITY ORIGIN

Boddington Gold Mine

COMMODITY DESTINATION

Bunbury Port

PRIMARY TRANSPORT METHOD

Concentrate is moved on the road network, predominately Pinjarra-Williams Road and Forrest Highway

FUTURE GROWTH EXPECTATIONS

Stable

SUPPLY CHAIN OPPORTUNITIES

There are no opportunities to move copper concentrate on rail, due to the distance of mining operations from a rail head. However, the proposed Pinjarra Eastern Bypass will provide a more direct route for heavy vehicles and reduce their impact on the Pinjarra townsite.





- Caustic soda is used in the manufacture of pulp and paper, soap and detergents, petroleum products and chemical production.
- ▶ In WA it is predominantly used in bauxite refineries to produce alumina.
- ► It is imported mainly from North America.

MAJOR PLAYERS

Worsley Alumina (South32) and Alcoa of Australia

ANNUAL IMPORT VOLUME (BUNBURY)

2018-2019 FY

1,373,000 tonnes

COMMODITY ORIGIN

Bunbury Port – three storage tanks located at the Port with associated infrastructure shared between the two major importers

COMMODITY DESTINATION (LOCAL)

875,000 tonnes to Worsley (South32) 498,000 tonnes to Wagerup and Pinjarra (Alcoa)

PRIMARY TRANSPORT METHOD

Rail tanker to the respective alumina refineries in Worsley and Wagerup

FUTURE GROWTH EXPECTATIONS

Stable - Direct relationship to alumina refinery operations although the amount of caustic soda required to produce alumina is dependent on the grade of the bauxite being refined. Refineries try to keep the grade of the ore consistent so that they can determine the volumes of other inputs that will be required, including caustic soda.

SUPPLY CHAIN OPPORTUNITIES

Some potential freight rail efficiencies through South West Main Line corridor improvements could be funded through future overall growth in demand.





- The agricultural industry in the South West does not create the significant volumes that the mining industry does, although it will have an important role in future economic prosperity and job creation in the South West.
- There is also significant potential to increase the number of companies involved in higher value food and beverage manufacturing and processing, adding value to primary produce supply chains.

MAJOR PRODUCTS (OVER \$10M)

Avocados, apples, canola, carrots, cattle, grapes (for wine production), hay, milk, onions, potatoes, sheep and lambs, and wool

GROSS VALUE (2017-2018) BUNBURY SA4

\$890.4 million

COMMODITY ORIGIN

Dispersed throughout the region

COMMODITY DESTINATION (LOCAL)

The majority of fresh food product is trucked to the Perth metropolitan region for consumption. Some high-value products are exported through Perth Airport as underbelly freight whilst less perishable items are exported in containers from the Fremantle Inner Harbour.

PRIMARY TRANSPORT METHOD

Road Transport - Forrest Highway

FUTURE GROWTH EXPECTATIONS

High - although contribution to road tonnage likely to remain minimal given the commodity's high value, low volume nature

- The Picton to Greenbushes freight rail line reinstatement and the development of an IMT/logistics park could provide an attractive alternative to long distance road transport.
- New passenger services from the Busselton Margaret River Airport may provide aircraft underbelly freight opportunities for local produces with highvalue, time-critical products such as seafood and gourmet fresh produce.





- ▶ The South West generates around 20,000 containers.
- Import volumes are modest, with most imported goods being unpacked and distributed from Perth and local consumption.
- Fremantle Inner Harbour and Esperance Port are the only ports within Western Australia that currently have container handling capabilities.
- The Westport Taskforce has confirmed that Bunbury will not be considered as a future container port. Future containerised South West exports will be shipped from berths at either Fremantle or Kwinana.

POTENTIAL PRODUCTS IN THE SW

Mineral sands, timber products, lithium, beef, dairy, horticulture

TEUS

Approximately 20,000 Twenty Foot Equivalent Units (TEUs) are currently generated in the South West. This figure has been derived from two separate studies into container movement commissioned independently by the Westport Taskforce and Southern Ports Authority.

COMMODITY ORIGIN

Mines, plantations, processors and farms throughout the South West region

COMMODITY DESTINATION

Fremantle (export), Perth (domestic markets), and Kewdale Intermodal Terminal (interstate markets)

PRIMARY TRANSPORT METHOD

Currently use the road network, as no container rail freight service between Bunbury and Perth. Road network – Forrest Highway, Kwinana Freeway, Leach Highway

FUTURE GROWTH EXPECTATIONS

High - export of containers from the region is expected to increase due to increased production from existing sources as well as new commodities being containerised for export efficiency. There is little potential for import container freight growth

- Growth in local production could eventually support a regular (i.e. daily) container service to Perth in the future and eventually a container shipping service directly to Bunbury Port.
- A new IMT could be incorporated into a logistics park that would include warehousing and cold storage for various product types.





PART FOUR: STRATEGIC OPPORTUNITIES

A growing volume of products will be exported from the South West region in the future. To be competitive in global markets, these exports need to be supported by improvements to road, rail, air and shipping supply chains.

STRATEGIC RAIL OPPORTUNITIES

The existing freight rail network in the South West is able to accommodate existing volumes on what is essentially a single track supplemented by strategically positioned crossing loops. The single-track configuration limits operational flexibility including the network's capacity to recover from incidents and delays and can therefore impact transport costs. The network is also operating close to capacity in some sections, such as the 18 kilometres of track between Brunswick Junction and Picton East.

While growth in bulk exports from Bunbury Port may increase demand on the current rail infrastructure, the potential to accommodate new train paths in certain sections is limited by its configuration. This decreases the rail networks' capacity to attract new freight tasks which would require new train paths and new terminal space for the loading and unloading of freight.

Additional rail corridor capacity can be achieved through line duplication, new passing loops and rail sidings. These improvements will help to ensure that service efficiency and reliability is maintained for all corridor users as freight volumes on rail increase.

Greater utilisation of the rail network has the potential to cause delays on the road network because of the presence of several level crossings in the South West. This includes the rail crossing at South Western Highway in Picton and Estuary Drive near Bunbury Port. If rail traffic increases and grade separation is not provided, vehicles are likely to take alternative routes. For example, an alternative route to Estuary Drive to access Bunbury town centre is Forrest Highway and through the already congested Eelup roundabout.

There is also a level crossing with Coalfields Highway, near South Western Highway, which would be impacted upon by increasing train paths on the South West Main Line.

In addition to bulk resource exports, the South West is a source of significant containerised and general freight destined for export or domestic markets. Continued growth in international and domestic containerised goods may generate demand for a container rail shuttle to Perth. A rail shuttle could provide modal choice for local exporters and would need to be supported by the development of an intermodal terminal (IMT) in the region.

Successful IMTs balance the number of inbound containers with the number of outbound containers. The current balance in the South West is heavily outbound (export) dominated, therefore suitable empty containers (20ft, 40ft, food grade, refrigerated) would need to be sourced. Preliminary analysis suggests that a throughput of approximately 70,000 TEUs annually is required to make the construction of a new IMT financially viable, while the recommissioning of existing IMT facilities could be feasible with lower volumes.

There are multiple sites adjacent to the freight rail network which could accommodate a future IMT, if and when it is commercially attractive to do so. This includes sites near the Bunbury Port precinct, Picton West, Picton East and within the Waterloo Industrial District Structure Plan area, as shown in Figure 7.

Several specific rail network enhancement projects, detailed below, may be required in the medium term, as the volume of bulk and containerised freight generated in the South West increases.

The environmental benefits of transporting freight on the rail network as opposed to the road network is well recognised globally and in the development of this Strategy.

WATERLOO

A freight rail precinct developed within the future Waterloo Industrial Precinct is considered to be an optimal location for an intermodal terminal. An IMT in this location could aggregate freight volumes destined for the Perth domestic market, interstate and for export.

The development of an IMT in this location may trigger interest from businesses likely to benefit from having access to the rail line to co-locate, including providers of logistics and warehousing services. This precinct would bring new freight volumes to the system and could improve the reliability of the network for all users by also providing a passing loop/or rail siding.



FIGURE 7: POTENTIAL INTERMODAL TERMINAL LOCATIONS

LONG-TERM TIME HORIZON

In the longer term, if significant population growth occurs, combined with growth in locally generated export freight, container volumes may reach a level at which it would be viable for a container terminal and shipping service to exist at Bunbury Port.

An IMT developed outside of the Port precinct, initially to rail containers to Perth, could be the origin of a shuttle service to Bunbury Port, similar to the rail shuttle which currently runs from Forrestfield to North Quay in North Fremantle.

BUNBURY PORT

The Port is at the heart of the South West rail network. It is currently served by a single-track connection to the northern side of the Inner Harbour where the alumina berths are located. Another siding serving the southern side of the Inner Harbour is currently dormant.

To improve access for new export commodities, it may be necessary to augment the current layout by adding a new connection to service the Inner Harbour common user berths and duplicating the access corridor for improved service capacity and reliability.

These works may allow for current and future export commodity volumes currently moved by road, to be transferred to the rail network. These works will be considered in the context of evidence of increased export demand, private sector interest and incorporation into the Southern Port Authority's Revised Inner Harbour Structure Plan.

SOUTH WEST SUPPLY CHAIN STRATEGY

GREENBUSHES

The Picton-Greenbushes Rail Line has been non-operational for almost 20 years. A feasibility study into the reinstatement of the line to transport lithium ore is currently being undertaken by Talison Lithium and Arc Infrastructure.

Despite a recent downturn in lithium prices and the deferral of investment in downstream processing operations, the Greenbushes mine is expected to ramp up production of lithium ore until 2025. The proposal would result in the ore being loaded near the mine in Greenbushes, and then railed to Bunbury Port for direct export, or to one of the two processing plants, located in Kemerton, provided the spur line is built, and in Kwinana.

Other improvements would also be required to support the freight task by rail including new common user discharge facilities in Kemerton, Kwinana and Bunbury, as well as other modifications at Bunbury Port.

Talison Lithium and Arc Infrastructure will continue investigating the feasibility of this project throughout 2020 and are expected to present a project funding proposal for the Government's consideration when this work is complete. Feasibility will depend on annual production volumes reaching a level that would warrant the significant capital investment that is required for the line to become operational.

If the line does become operational, there is potential for other commodities to use rail, including relatively small amounts of timber and refrigerated containers of horticultural produce. These products would require additional facilities to successfully operate, such as a cold storage facility and a container handling function. The impact of an operational rail line on the existing road network must also be considered. There are five rail crossings with South Western Highway. Two of these are in townsites, Kirup and Boyanup, whilst one is located on a flat section of track just north of Greenbushes.

Two of the level crossings are located at the bottom of hills, Brookhampton and Argyle, and have potential safety issues as trucks descend. The location of the crossings at the bottom on hills allows for grade separation to be achieved although still at significant cost.

A sixth level crossing which would be impacted by the reinstatement is in Dardanup where the rail line runs parallel to Boyanup-Picton Road and crosses Ferguson Road. In this location it would be difficult to achieve grade-separation due to insufficient stacking distance from the rail crossing to the Boyanup-Picton Road Ferguson Road intersection.

KEMERTON RAIL SPUR

The proposed spur line from the South West Main Line into the Kemerton Strategic Industrial Area will support heavy industry and resource processing in the South West by providing rail access and modal choice. The next stage in this infrastructure proposal is the development of a business case, noting the requirement of costly grade separations.



STRATEGIC ROAD OPPORTUNITIES

The extensive road network in the South West is currently meeting requirements although a number of future projects will enhance freight efficiency as well as road safety and journey times for local, commuter and tourist traffic.

Modest increases in mining commodities are predicted on the main arterial routes to Perth, including Forrest Highway, along with growth in general commuter and tourist traffic. Copper concentrate and other mining related products are expected to continue using Pinjarra-Williams Road at current volumes.

The movement of timber products along Bussell Highway, Sues Road, Vasse Highway and South Western Highway is expected to continue at existing volumes as is the main grain route between Arthur River and Bunbury Port, Coalfields Highway.

STRATEGIC AIR OPPORTUNITIES

In the future the South West will be connected to interstate and international markets via the Busselton Margaret River Airport. This offers great potential for the exports of fresh produce.

Commercial passenger flights to Melbourne are expected to commence once interstate travel restrictions are eased, offering aircraft underbelly freight opportunities for local producers to east coast markets.

An air freight hub is also being progressed by the City of Busselton with seven fully serviced sites available for lease. The most significant road project in the South West is the Bunbury Outer Ring Road (BORR) which, once complete, will connect the region's key industrial areas and road networks with Bunbury Port.

The BORR will improve freight times and supply chain efficiency, and simultaneously enhance road safety by separating local traffic from freight vehicles. It will also encourage further development at Bunbury Port.

If the Picton-Greenbushes Rail Line is not reinstated, improvements to South Western Highway will be required to accommodate an increase in heavy vehicle traffic using this road to access Bunbury Port, Kemerton and Kwinana.





PART FIVE: CHALLENGES AND RESPONSES

KEY CHALLENGES



Co-ordination and prioritisation of available infrastructure funding remains a significant challenge for local governments, State Government and the private sector.



The South West freight rail network is approaching operational capacity at strategic locations. Further growth in demand will be difficult to accommodate without key investment along the corridor.



Freight rail infrastructure connecting bulk exporters to Bunbury Port does not meet the needs of all users. Potential growth in bulk exports is also constrained by railway connectivity to the berths at Bunbury Port.



5

There is no container rail service currently available for the movement of general and containerised freight between the South West and broader export and domestic markets.

Limitations on the Restricted Access Vehicles (RAV) network reduces transport efficiency south of Bunbury with impacts on freight costs and increases the total number of truck journeys.



Road safety remains a major concern in the South West where high volumes of freight, local and tourist traffic interact



Air freight services for high value goods are constrained by the lack of dedicated freight services and the limited number of commercial passenger flights from the Busselton Margaret River Airport.

RESPONSES TO CHALLENGES

Refer to map in Figure 8 for the location of possible initiatives (excludes Key Response 1, which is not location specific).

KEY RESPONSE		POSSIBLE INITIATIVES		JUSTIFICATION
1	Identify, prioritise and coordinate infrastructure improvements across government and the private sector.	1.1	Work with Infrastructure WA, state agencies and local governments, to establish strategic network priorities and develop sustainable funding options for infrastructure	Provides certainty for infrastructure funding priorities, and simplifies and standardises business case assessment processes
2	Rail infrastructure managers to collaborate on business cases for corridor update works	2.1	Revise rail connections within Bunbury Port as part of a redesign of road and rail access arrangements	Supports businesses using northern side common user berths and accommodates future growth in bulk exports
		2.2	Duplicate rail line between Picton and Bunbury Port	Improves rail service reliability and overall capacity into Bunbury Port
		2.3	Recommission Picton-Greenbushes rail line	Attracts lithium ore as baseline rail customer, and potentially forestry and fresh produce
		2.4	Construct additional crossing loop(s), passing lane or full duplication of the Picton East-Brunswick Junction section	Improves capacity, reliability and service efficiency for all current and future rail traffic to and from the South West
		2.5	Progress Business Case for the Kemerton Rail Spur	Construction would enable rail transport of bulk product into Kemerton, and to transfer processed export product to port
3	Reconfiguration of road and rail access to Bunbury Port	3.1	Construct bridge Turkey Point and access road ¹⁴	Provides secondary access to the port inner harbour and separates local traffic from port traffic
	will reduce landside costs for current and future exporters	3.2	Improve rail access to common user berths	Prepares Bunbury Port for growth in bulk export commodities
		3.3	Subject to market demand over the longer term, develop a berth to enable the operation of a niche container shipping service	Provides flexibility and potential trade options for the port in- line with future population and industrial growth
4	Facilitate the re-establishment of container rail services between Bunbury and Perth	4.1	Encourage the development of an intermodal terminal in the Bunbury area, either via the reinstatement of existing facilities or through the development of a potential new IMT within the future Waterloo Industrial Park	Provides the catalyst for increased rail freight services between the South West and Perth, including container freight, mineral sands, fresh produce, forestry products and lithium ore
5	Targeted road investment, including strategic Restricted Access Vehicles upgrades, will improve freight efficiency and minimise supply chain costs	5.1	Complete Bussell Highway Duplication between Capel Bypass and Busselton, and upgrade to RAV 7	Extends heavy vehicle access to locations south of Bunbury, providing efficiency gains for north-south freight movement
		5.2	Construct new roundabout at South West Highway and Vittoria Road intersection	Improves traffic flow in built up urban area, reducing congestion and improving efficiency
		5.3	Extension of Willinge Drive south from Bunbury Outer Ring Road to South Western Highway	Provides improved connectivity between industry and Bunbury Port

KEY RESPONSE		POSSIBLE INITIATIVES		JUSTIFICATION
6	Strategic town by-passes to separate freight and commuters from local traffic	6.1	Complete Bunbury Outer Ring Road	Removes traffic from Bunbury local roads, reducing congestion, improving amenity and delivering greater efficiency to north-south road freight movements
		6.2	Construct Stage 1 of the Pinjarra Eastern Bypass, between Greenlands Road and Pinjarra Williams Road	Removes traffic going through Pinjarra town site, reducing congestion, improving amenity and delivering greater efficiency to north-south road freight movements
		6.3	Duplicate Busselton Bypass	Provides additional capacity until the Busselton Outer Bypass (6.4) is required
		6.4	Confirm the alignment of the proposed Busselton Outer Bypass, between Sues Road and Vasse Newtown	Removes through traffic from Busselton urban areas and provides improved freight connectivity to Margaret River, Augusta and other tourist destinations
6a	Ongoing improvements to the road network will benefit road safety and the interaction between	6a.1	Undertake intersection improvements on Forrest Highway including Greenlands Road, Preston Beach Road / Johnson Road, Paris Road, Hynes Road, Old Coast Road and Raymond Road	Improves road safety on Forrest Highway
	general and freight traffic	6a.2	Upgrade and improve South Western Highway between Waroona and Bunbury, including realignment and new overtaking lanes	Improves road safety on South Western Highway
		6a.3	Widening and intersection upgrades of South Western Highway between Vasse Highway and Walpole	Improves road safety on South Western Highway and movement of heavy vehicles
		6a.4	Continue with seal width increases on Collie Mumballup Road	Improves road safety on Collie Mumballup Road
		6a.5	Undertake improvements on Pinjarra-Williams Road, including realignments, new passing lanes and climbing lanes	Improves traffic interaction issues between heavy vehicles from the Boddington Gold mine, and other road users
		6a.6	Undertake safety improvement package on Caves Road between Yallingup and Augusta, including Yallingup Beach Road intersection	Improves road conditions in South West Capes area, benefitting tourism and local business
6h	Grade separation of road and rail infrastructure	6b.1	Grade separation of the freight rail line and South Western Highway at Picton	Improves freight efficiency and road safety
		6b.2	Grade separation of the freight rail line and Estuary Drive	Improves freight efficiency and road safety
		6b.3	Grade separation of the freight rail line and Coalfields highway (near South Western Highway)	Improves freight efficiency and road safety
		6b.4	Grade separation of the Picton-Greenbushes Rail Line and South Western Highway at Kirup, Boyanup, north Greenbushes, Brookhampton and Argyle	Improves freight efficiency and road safety
		6b.5	Grade separation of the freight rail line in Dardanup (Ferguson Road)	Improves freight efficiency and road safety
7	Encourage the long-term growth of air freight out of the Busselton Margaret River Airport as new export markets develop	7.1	Work with local industry and other stakeholders to establish strategic air freight opportunities and support efficient road freight movement into Busselton Margaret River Airport	Realises potential air freight opportunities, connecting the South West with interstate and international consumers



FIGURE 8: LOCATION OF POSSIBLE INITIATIVES

PART SIX: NEXT STEPS

This Strategy provides a guiding framework for industry to strategically align with the State's vision for freight transport into the future. A number of government and industry stakeholders have had input in to the drafting of the Strategy.

The State Government may elect to pursue project packages of its own accord, although industry-led development of business cases that align with the Strategy project packages are also encouraged. These should occur in consultation with State Government, including options analysis and detailed cost benefit analysis.

This draft Strategy has been released for public consultation. All feedback provided will be considered for incorporation into the final *South West Supply Chain Strategy* for review by State Government before its release.

FOOTNOTES

- 1 REMPLAN, 2018, Community Profile South West Region
- 2 REMPLAN, 2018, Economy Profile South West Region
- 3 Department of Primary Industries and Regional Development, 2018, Gross Regional Product 2018
- 4 Southern Ports Authority, 2019, Strategic Development Plan FY2020-2024
- 5 DevelopmentWA, 2019, Kemerton Strategic Industrial Area
- 6 DevelopmentWA, 2019, Shotts Strategic Industrial Area
- 7 Department of Planning, Lands and Heritage, 2019, Draft Waterloo Industrial Park District Structure Plan
- 8 DevelopmentWA, 2019, Preston Industrial Park Northern Precinct
- 9 Department of Planning, Lands and Heritage, 2019, Picton Industrial Park District Structure Plan
- 10 Southern Ports Authority, 2019, Strategic Development Plan FY2020-2024
- 11 Data from Southern Ports Authority, 2019, Strategic Development Plan FY2020-2024
- 12 Data from Southern Ports Authority, 2019, Strategic Development Plan FY2020-2024
- 13 Southern Ports Authority, 2019, Strategic Development Plan FY2020-2024
- **14** \$15M in funding was announced for this project in May 2020, expected completion in late 2021.

SOUTH WEST SUPPLY CHAIN STRATEGY



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