GlobeLink

Scoping Study Report
Business Case – Stages 1 and 2
South Australia Department of Planning,
Transport & Infrastructure

December 2019

Prepared by KPMG on behalf of

KPMG.com.au
Prepared by KPMG on behalf of the Department of Transport, Planning and Infrastructure, with technical support from AECOM
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Executive Summary

The SA Government’s GlobeLink policy commits to a disciplined process to understand and quantify South Australia’s supply chain challenges and constraints; to identify and test the spectrum of possible solutions; and to identify solutions that support increased trade and investment and drive sustainable economic growth and employment.
About GlobeLink

South Australia has always been an export economy, built on natural advantages from extractive and productive industries, twinned with the historic comparative advantage of highly skilled manufacturing workforce; which produced value added products including vehicles, fuel refining, and food and beverage.

The past few decades have seen South Australia impacted by a range of domestic and global factors that have eroded the standing of the South Australian economy and seen South Australia’s trade surplus narrow; with economic and social impacts accruing through reduced economic productivity and prosperity.

GlobeLink is a SA Government policy, committing to an evidence-based examination of the freight challenges impacting South Australia’s trade – identifying the best mix of options to increase the reach of South Australia’s exports – and to reduce the cost of moving goods.

The initial policy identified four reference projects, which are:

- A non-stop freight road to connect from the South Eastern Freeway to Adelaide’s motorway network;
- An intermodal export park to the south east;
- A freight railway to replace the legacy Adelaide Hills segment of the ARTC track; and
- A dedicated freight airport, to Adelaide’s south-east.

These initial project options formed inputs to the GlobeLink Scoping Study, but were assessed against a broad range of alternative capital and non-capital options to identify options best placed to grow export trade and create economic opportunities.
Defining GlobeLink

The GlobeLink Scoping Study commenced with a spatial definition of the GlobeLink Study Area. This saw the identification of GlobeLink’s freight catchment; as well as the identification of an infrastructure corridor for option identification. The initial infrastructure corridor reflected the GlobeLink reference projects; but was expanded during the study to allow a wider consideration of potential project options.

Figure 1 below shows the GlobeLink freight catchment extending across the Victorian border, the initial infrastructure corridor and the expanded corridor, which encompasses all of Greater Adelaide.

Figure 1: The GlobeLink defined areas
GlobeLink objectives

KPMG developed a range of project objectives, which were tested with SA Government and freight industry stakeholders. These objectives were aligned with SA Government’s policy and industry priorities – and provided a basis to filter a longlist of potential options to a manageable shortlist for detailed inquiry. These objectives are:

1. Boost state and national productivity to capitalise on market opportunity over the long term through improved freight system efficiency, connectivity and capacity (29%)
2. Increase and attract new employment and investment within the region and for South Australia (25%)
3. Improve safety and amenity, and achieve social benefits that are considerate of community views (16%)
4. Attract industry and Government partnerships to create affordable outcomes (15%)
5. Optimise the use of existing South Australian Infrastructure (15%)

Stakeholder prioritisation of GlobeLink objectives
SA’s primary freight networks

Figure 2 below shows South Australia’s key freight road and rail freight corridors and their destinations, as well as key freight nodes.

Figure 2: Map of the South Australia’s primary freight network

Our analysis shows that South Australia’s freight networks transported 226 million tonnes of freight in 2018. Of this, 28 million tonnes (12 per cent) was international trade carried via South Australia’s air and sea ports; and 198 million tonnes (88 per cent) was domestic freight.

Table 1: South Australia’s 2018 freight task by mode (tonnes in thousands)

<table>
<thead>
<tr>
<th>Mode</th>
<th>Tonnes '000s</th>
<th>Road</th>
<th>Rail¹</th>
<th>Air</th>
<th>Sea</th>
<th>Total</th>
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<tbody>
<tr>
<td>International</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>32</td>
<td>27,988</td>
<td>28,020</td>
</tr>
<tr>
<td>Domestic</td>
<td>175,150</td>
<td>11,662</td>
<td>27</td>
<td></td>
<td>11,472</td>
<td>198,311</td>
</tr>
<tr>
<td>Total</td>
<td>175,150</td>
<td>11,662</td>
<td>59</td>
<td></td>
<td>39,460</td>
<td>226,331</td>
</tr>
</tbody>
</table>

Source: AECOM estimated volumes based on source data (RFMS, ARTC, BITRE, Adelaide Airport data)

¹ Based on interstate movements and converted from gross tonnes to net tonnes by AECOM analysis.
Sea freight is the dominant mode for international trade, carrying 99.9 per cent of all international freight. Air freight via Adelaide Airport carried 0.1 per cent by volume, but can be assumed to be a substantially higher share of freight when measured by value. For reference, air freight measured at a national level is a similar portion by volume, but 21 per cent of national freight by value, reflecting the (very) high value of air freight.

Road transport dominates domestic freight, hauling 175,000 tonnes (88 per cent); followed by rail at 11,662 tonnes and coastal shipping at 11,472 tonnes – representing a market share of about 6 per cent each.

Some 87 per cent of South Australian freight movements don’t cross state borders – the majority occurring within Greater Adelaide itself; while 13 per cent of total road freight volumes are interstate trade.

Our analysis shows that around two thirds of interstate road freight is carried between Victoria and South Australia; with NSW representing around a quarter of total road freight volumes. The other jurisdictions represent only a tiny proportion of road freight volumes, reflecting the long distance and high costs.

In total, road freight carries three quarters of freight volumes, followed by shipping at 17 per cent, with rail at just 5 per cent of overall freight volume.

Our field work, supply chain study and wider research has been used to develop a sophisticated model of South Australia’s existing freight supply chains; providing visibility of the costs and effects of existing gaps. Using this, we have modelled the cost and effects of growth scenarios.

### SA road freight
- Road carries 88.3 per cent of domestic freight
- 87 per cent of journeys are intrastate
- 13 per cent of journeys are interstate
- 84 per cent occur within the GlobeLink catchment area
- 70 per cent are shorter than 200km
- 37 per cent of intrastate movements are within Greater Adelaide with 90 per cent trips <30km
- Two thirds of interstate freight travels to/from Victoria via the South Eastern Freeway
- One quarter travels to/from NSW via the Sturt Highway
- 54 per cent of interstate road freight is outbound
- Larger HPVs (e.g. B-Triples) are not permitted on the South Eastern Freeway west of Monarto

### SA rail freight
- Rail carries 5.9 per cent of domestic freight
- 80 per cent are non-bulk goods using intermodals
- 35 per cent of inbound freight originates in Victoria
- 46 per cent of outbound freight is destined for WA
- Trains can be ‘double stacked’ to WA, NT and NSW, but not Victoria due to vertical clearance restrictions on both sides of the border
- Rail freight is evenly split between inbound and outbound journeys
SA sea freight

- Shipping moves 17 per cent of SA’s freight, second only to roads in market share
- 71 per cent is international trade
- 29 per cent is coastal shipping, largely to/from the Port of Melbourne
- Outer Harbor connects to trading partners in the UK, Europe, the USA, various markets in South East Asia and the Middle East
- Ship calls have risen by 23 per cent in the past 5 years, increasing capacity and connection to world markets
- A substantial portion of sea freight appears to be ‘land bridged’ for export via Melbourne
- Rail incurs additional handling costs at Outer Harbor due to an inefficient alignment of the rail head

SA air freight

- Aviation moves less than 0.1 per cent of freight volumes, but substantially more by value
- 54 per cent of air freight is international, the balance is domestic
- Adelaide Airport carries two thirds of exports, the balance is moved by truck to Sydney or Melbourne, reflecting the increased frequency and connections at those airports
- International air freight has grown by 31 per cent since 2013, because of new direct international passenger services
- Key South Australian industries, including (very) high value fresh meat & seafood, prepared food and beverage exports, have led this rapid growth

SA intermodal terminals

- Adelaide has three major intermodalis at Islington, Penfield and Outer Harbor
- Islington is used to increase single stacked trains to double stacked configuration
- Supply chain evidence indicates intermodalis are operating well below capacity, with no foreseeable constraints in the medium term
- There is no intermodal facility in the south-east of South Australia between Adelaide and Bordertown on the Victorian border
- There is an existing plan for a private IMEX ‘inland port’ at Monarto
- Investment in Victoria’s Wimmera Terminal has a similar geographic economy to SA’s south east, and delivered positive results

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2 Analysis of BITRE Waterline reports 62 and 52
Our freight forecasts

The figures below show the forecast road and rail tonnages transported through the GlobeLink study area, as well as the forecast air cargo at Adelaide Airport, where total volumes are expected to grow from 59,500 tonnes in 2019 to 139,700 tonnes in 2050.

Our projections indicate that by 2050 road freight is anticipated to carry more than 95 percent of total freight generated in the GlobeLink catchment.

Intercapital rail freight on the Perth – Melbourne route is forecast to grow by an average annual rate of 1.9 per cent; but tonnages on the Adelaide – Melbourne corridor do not grow.

Figure 3: GlobeLink road freight forecasts

Figure 4: GlobeLink rail (LHS) and air (RHS) freight forecasts

Figure 5 and Figure 6 show the increasing congestion levels in Adelaide between 2016 and 2036, with the maps illustrating the volume of traffic on a road at a given point in time against that roads rated maximum capacity. While Figure 5 includes all road network completed at 2016, Figure 6 includes the completion of a grade separated motorway on the North South Corridor, but no other major investments.

Figure 5: 2016 road network AM volume capacity plot

Figure 6: 2036 road network AM volume capacity plot

Source: AECOM
Finding, quantifying and validating South Australia’s freight challenges

We undertook detailed engagement with the South Australian freight industry and the industries it serves to identify perceived problems and opportunities. These were developed into a series of ‘problem and opportunity statements’, which serve as a series of hypotheses to guide our investigations. These statements were tested with the GlobeLink freight industry reference group, SA Government agencies and with beneficial cargo owners within the GlobeLink freight catchment area. These ‘problem and opportunity statements’ were subjected to detailed analysis to identify, validate and quantify the scale and cost of business-as-usual; and are outlined in Figure 7 below.

Figure 7: South Australia’s freight challenges

Better connectivity between key freight gateways, interstate freight networks and SA’s growth areas would attract new industries, private sector investment and support employment growth in South Australia.

Freight movements to, through, and from Adelaide traverse complex topography and built up residential areas, or follow steep gradients and sharp curvatures, reducing the speed and efficiency of freight movements, which in turn impacts the commuter network.

There are limited road and rail links connecting Adelaide to key interstate industries and gateways, leaving the network vulnerable to major incidents.

Improving frequency and access to services at Adelaide’s air and sea ports would improve South Australia’s export potential and connectivity to global markets.

South Australia’s primary road and rail freight routes traverse through the Adelaide Hills and arterial and suburban areas of metropolitan Adelaide, increasing safety risks and adversely impacting the liveability of local residential areas.

Co-locating and clustering of industries and supply chains will create an opportunity to grow South Australia’s emerging industries.
Testing, validating and numerating SA’s key freight problems and opportunities

Our analysis of the GlobeLink problem and opportunity statements and the corresponding series of hypotheses allowed for the size of identified challenges to be measured and evidenced.

**HYPOTHESIS 1:**
Better connectivity between key freight gateways, interstate freight networks and South Australia’s growth areas would attract new industries, private sector investment and support employment growth in South Australia.

1 **South Australia’s freight networks connect well to Adelaide’s north; but are fragmented to the south-east**

South Australia’s road and rail freight corridors provide relatively unconstrained connections to interstate markets in New South Wales, Queensland, the Northern Territory and Western Australia; however the south-east remains relatively poorly connected, with operating restrictions on road and rail transport through the Adelaide Hills; no motorway-grade road connection through Adelaide itself; and limited intermodal capacity in the south-east, with only the recently mobilised Bordertown intermodal.

2 **South Australian industries are less profitable than their counterparts in other states, creating a disincentive for private investment**

South Australian industries generally perform less profitably than the same industries in other states. For example, wine, spirits and tobacco see a gross operating surplus 7.5 per cent below the national average; and beer manufacturing 5.6 per cent. These lower profit margins are a disincentive for business to make large-scale investments. Freight improvements that lower supply chain costs may improve profitability and support investment.

3 **Improving connectivity to Adelaide’s south-east could reduce costs and contribute to improved profitability of certain industries**

The transport multiplier for South Australia, an indication of the relative output from an investment in transport, was estimated at 1.3 in 2018. That is, an increase to transport output by $10 million could stimulate an additional output of $13 million for subsequent activity. For road transport, this multiplier was higher at 1.4 showing the potential benefit from a safe, contiguous road connection between the South Eastern Freeway and Adelaide’s motorway network.

- Improved freight access to and from Adelaide and the Victorian border could improve transport and productivity

**HYPOTHESIS 2:**
Freight movements to, through and from Adelaide traverse complex topography and built up residential areas, or follow steep gradients and sharp curvatures, reducing the speed and efficiency of freight movements, which in turn impacts the commuter network.

1 **Using suburban roads as major freight corridors sees higher costs**

Unlike other major capital cities in Australia, no contiguous motorway exists to facilitate road freight movements through Adelaide from the south-east. This sees Adelaide with the lowest traffic flow speed of the capital cities, less than 60 km/h; and also the third most variable travel times of the capital cities, behind Sydney and Melbourne.

2 **Steep grades along the South Eastern Freeway see slower road freight speeds, higher costs**

Freight moving along the South Eastern Freeway must navigate a steep decline into Adelaide. This imposes variable speed restrictions on heavy vehicles, increased fuel consumption, brake wear, wear and tear; resulting in an increased cost of $14.30 per trip, or $62,920 per day for the 4,400 trucks that use the route from the intersection of Portrush and Cross Roads and the highest point of the South Eastern Freeway.

3 **The Adelaide Hills make rail freight even less competitive**

The Melbourne - Adelaide rail corridor traverses through the Adelaide Hills, which is among the tightest and steepest railway corridors on the interstate network, resulting in speed restrictions, and increasing operating costs – with 50 per cent more locomotive power per tonne required than other rail freight corridors.

- New road and rail corridors that avoid the steep grades of the existing Adelaide Hills routes could reduce operating costs posed by steep terrain.
- Development of a motorway grade road connection through Adelaide from the South-east would reduce the costs and delays posed by operating on suburban arterial roads.
**HYPOTHESIS 3:**

Improving frequency and access to services at Adelaide’s air and seaports would improve South Australia’s export potential and connectivity to global markets.

1. **Adelaide has plenty of runway, with capacity for more planes**

   Most international air freight is carried in the belly hold of passenger aircraft, with relatively few dedicated freighters operating globally. Our analysis suggests that a dedicated freight airport would require volumes of circa 500,000 to 1 million tonnes per annum to be commercially viable. Current South Australian air freight volumes are circa 59,000 tonnes, around 10 per cent of the minimum viability threshold.

   Adelaide Airport has the lowest number of direct international air connections of any major Australian capital city; some 40 per cent less than Perth Airport. The lack of wide-body aircraft connections means that around half of South Australia’s potential direct air freight exports are carried by truck to Sydney or Melbourne – and likely sees potential high value exports fail to reach overseas markets. This said, our investigations show that international air freight has doubled since 2011, because of the export capacity created by new wide-body air passenger services connecting Adelaide to the Middle East – providing capacity and new connections for air freight.

2. **Outer Harbor is unconstrained – but landside investments could improve port choice**

   Outer Harbor enjoys substantial quayside and vessel capacity, with a 23 per cent increase in ship calls since 2012, increasing frequencies and broadening the range of destinations for customers. The recently completed $80 million channel deepening will also allow Outer Harbor to accommodate the larger ‘post Panamax’ vessels. The attraction of larger ships will further ease the cost of moving containers, taking advantage of the economies of scale these ships have to offer.

   One constraint on Outer Harbor is the costs posed by the disoriented rail head, which complicates the logistics of moving containers between the rail head and the ship.

- A dedicated freight airport is unlikely to be feasible, but attracting new connections could grow (very) high value freight and visitor economy exports
- Outer Harbor enjoys substantial quayside and vessel capacity to comfortably accommodate growth, but sees some constraints on rail freight at the port
HYPOTHESIS 4:
Co-locating and clustering of industries and supply chains will create an opportunity to grow South Australia’s emerging industries

1 **Co-location and clustering may catalyse freight growth and reduce supply chain costs**

Co-location and clustering of similar companies and industries, with related supply chains provides logical benefits, gathered around connectivity of skills, resources and supporting industries – allowing specialisation and volume to drive competitive advantages. In this way, government policies which support efficient co-location can be used to stimulate innovation, investment and growth – and drive supply chains productivity for key regions.

2 **An intermodal export facility in South Australia’s south-east could provide benefits to local industry**

South Australia presently has no intermodal facilities in that region (with the exception of a new intermodal at Bordertown on the Victorian border); Victoria has three similar facilities serving that State’s comparable western districts. Existing plans for an IMEX facility near Monarto suggests there may be a feasible case for some form of intermodal export park, or freight village, in the Monarto – Tailem Bend area.

- A market-led intermodal facility, located around Monarto or Tailem Bend could increase rail utilisation and freight efficiency
- Supporting land use planning and development by SA and local governments could be used to encourage clustering of industries

HYPOTHESIS 5:
South Australia’s primary road and rail freight routes traverse through the Adelaide Hills, arterial and suburban areas of metropolitan Adelaide, increasing safety risks and adversely impacting the liveability of local residential areas

1 **Heavy vehicles are disproportionately represented in crash statistics...**

With no contiguous motorway network and congested metropolitan roads, both freight and passenger vehicles commingling on Adelaide’s major roads. This sees an increased safety risk to passengers and residents, with trucks disproportionately represented in crash statistics. For example, within Greater Adelaide, 21 per cent of the crashes over the period 2013-2017 involved heavy vehicles, with a cost to the economy of some $258 million per annum.

2 **...with a significant impact on the Adelaide Hills segment of the South Eastern Freeway**

In particular, the Adelaide Hills section of the South Eastern Freeway – servicing road freight demand between Adelaide and the Victorian border – has been exposed to 108 crashes per year, 33 per cent involving heavy vehicles over the same period.

3 **The Adelaide Hill’s rail corridor imposes on local communities’ liveability**

Growth in residential areas within the Adelaide Hills has encroached on the 19th century rail corridor; with some 50km of track between Adelaide and Nairne now passing through suburbs and towns housing more than 100,000 people. Along with safety impacts, externalities such as noise pollution arise from the increased locomotive work, ‘wheel squeal’ and braking required for trains to negotiate the steep gradient and tight curves.

- A safe motorway-grade connection through the Adelaide Hills to Adelaide’s motorway network would offer substantial safety benefits
- Diverting or reducing the impact of rail freight passing population centres within the Adelaide Hills and Adelaide could improve amenity for neighbouring communities
HYPOTHESIS 6:
There are limited road and rail links connecting Adelaide to key interstate industries and gateways, leaving the network vulnerable to major incidents

1. The South Eastern Freeway is a key economic artery – but diversions can be costly

The South Eastern Freeway provides an important strategic road link for freight and passengers travelling between Adelaide and the Victorian border; but should incidents arise, has relatively few alternate routes available for emergency detours. Closure of the Freeway sees B-Double freight vehicles making a 127km one-way diversion across the back of the Adelaide Hills and connecting north at the Sturt Highway, posing additional operating costs for each freight vehicle of approximately $230 per trip.

2. Line closures on the Melbourne to Adelaide rail corridor can have considerable impacts

Whilst significant rail line closures arise about once a year, disruptions on the Melbourne to Adelaide rail corridor place a choice on rail operators - waiting for the line to reopen; detour the rail trip via Parkes in NSW; or transfer freight onto trucks, which can incur a costly premium for the heavy, vast volumes of freight typically carried by trains. A rail detour via Parkes, adds an additional 15 hours of travel time, making the standard 13 hour journey a 28 hour trip. Excluding rail access charges, this deviation incurs an additional $42,115 in cost per one-way trip. As there are currently 46 scheduled trains between Dimboola and Keswick per week, this equates to approximately $0.28 million per day.

Network upgrades could reduce the probability of incidents requiring detours of road and rail freight corridors, as well as mitigate the cost and time impact of incidents causing disruptions
Defining and refining the widest array of potential solutions

The GlobeLink Scoping Study used direct engagement with the freight industry, cargo owners and SA and local government agencies, as well as wider stakeholders to identify the widest possible array of potential infrastructure and non-infrastructure options. Figure 8 below shows the definition, interrogation and refinement of options; considering each option’s feasibility, economic benefit and costs, and their ability to resolve the GlobeLink Scoping Study objectives.

We applied a four-stage review process, to identify options that best aligned with the study’s objectives and to focus attention on options with the greatest chance of delivering tangible economic benefits.

Figure 8: Summary of our four-stage option assessment and shortlisting process

- **Review 1: Refinement**
  A qualitative assessment based on their strategic alignment to the GlobeLink objectives and a practical assessment of their strengths and weaknesses.

- **Review 2: Multi Criteria Analysis**
  A Multi Criteria Analysis, with evaluation criteria reflecting the GlobeLink project objectives.

- **Review 3: Rapid-rapid CBA**
  A simplified quantitative assessment used to differentiate between road options.

- **Review 4: Rapid CBA**
  Economic appraisal of the options, quantifying the benefits delivered against the estimated whole-of-life costs of each option.
Through the option refinement process, two of the four initial GlobeLink reference projects were excluded from progressing to more detailed analysis in the rapid CBA.

**GlobeLink reference freight airport**

Our analysis shows that a dedicated freight-only airport would require volumes of between 500,000 and one million tonnes of air freight to be viable – with current air freight around 10 per cent of the minimum viable volumes needed. This suggests a freight airport would struggle to be feasible and likely struggle to attract dedicated air freighters.

However, our analysis does find a compelling case for air freight – but that this should be approached by seeking direct international connections to new markets by encouraging new Regular Passenger Transport (RPT) services. This would create freight capacity in the belly hold and generate new demand for (very) high value air freight exports, using existing infrastructure at Adelaide Airport – as well as stimulate South Australia’s visitor economy.

**GlobeLink reference freight road**

GlobeLink’s initial road corridor identified a potential alignment bypassing the Adelaide Hills to the east via Truro and entering Adelaide from the North.

This initial corridor rated well on qualitative measures, offering safety and amenity benefit; but our quantitative analysis shows that the transport benefits and patronage/utilisation would be limited, because the route is more than twice the length of the existing South Eastern Freeway and suburban arterial route. It also bypasses major trip attractors and generators.

The preliminary economic appraisal found that demand along the route produced insufficient benefits to justify the $2.6 billion capital costs. In fact – the assessment of the road produced a net present value of -$1,971 million and a Benefit Cost Ratio (BCR) of just 0.06, meaning the investment lacks merit when economic benefits are compared to costs.

This saw the reference corridor refined to consider shorter options, providing higher chances for productivity and efficiency benefits.
Key findings: Evaluating the shortlisted options

Our interrogation of options saw the longlist refined to six options for detailed technical and economic appraisal. These are:

Figure 9: Snapshot of investment options

1. More planes, more freight
2. Alternate M1 route – ‘Short South’
3. Alternate M1 route – ‘Short North’
4. Cross Road tunnel - M1 to North-South Corridor
5. GlobeLink Reference Rail
6. GlobeLink Reference Intermodal Export Park
Road options: Despite the safety and efficiency benefits, making a new road stack up would require integrated land use planning and significant development to increase demand.

BCR and NPV calculations for the three shortlisted road options provided sobering results. The appraisal assumes a four-lane, national standard motorway grade connections and uses direct conventional benefits, reflecting national and SA Government economic appraisal guidelines.

**Alternate M1 route – ‘Short South’**

<table>
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<tr>
<th>BCR</th>
<th>NPV</th>
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<tr>
<td>0.20</td>
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<td>‘+ planning’ BCR: 1.26</td>
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This option proposes a new 25 km road, with two lanes in each direction connecting the South Eastern Freeway at Mount Barker to the North-South Corridor (South Road) at St Marys in the south of Adelaide. The road includes motorway connections, with tunnelling through the Adelaide Hills, before connecting into the planned North-South Corridor, providing connectivity to Adelaide Airport, Outer Harbor and Adelaide’s industrial north. The capital expenditure for construction of the road is $1.4bn, with operational costs of $23m per annum.

The alignment of the road avoids residential areas, seeking to minimise safety and amenity impacts on existing communities, and, to the extent possible, avoid construction complexities through the Adelaide Hills.

**Alternate M1 route – ‘Short North’**

<table>
<thead>
<tr>
<th>BCR</th>
<th>NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.12</td>
<td>- $1,694 million</td>
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<tr>
<td>‘+ planning’ BCR: 0.80</td>
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</tr>
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</table>

This option proposes a new 37km road connecting the South Eastern Freeway at Mount Barker to Grand Junction Road at Hope Valley, in Adelaide’s north. The proposed new road will have two lanes in each direction, providing connection from the south-east of the state to the industrial north of Adelaide. The capital expenditure for construction of the road is $2.1bn, with operational costs of $34m per annum.

The alignment of the road avoids residential areas, seeking to minimise safety and amenity impacts on existing communities, and avoid construction complexities through the Adelaide Hills.

**Cross Road Tunnel – M1 to North-South Corridor**

<table>
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<th>BCR</th>
<th>NPV</th>
</tr>
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<tbody>
<tr>
<td>0.09</td>
<td>-$12,950 million</td>
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This option proposes to construct a new, dedicated 16.6km tunnel connection between the South Eastern Freeway east of Crafers and the North-South Corridor. The proposed tunnel would incorporate boring from past Crafers to the intersection at the South Eastern Freeway and Cross Road, and a cut and cover construction below Cross Road to the North-South Corridor. By starting the tunnel east of Crafers, the slowest and most dangerous sections of the South Eastern Freeway are avoided. The capital expenditure for construction of the road and tunnel is $18.2bn, with operational costs of $43m per annum.

Despite the need for road transport improvements between the South Eastern Freeway and Adelaide’s motorway network identified in the problem and opportunity statement, each road option struggled to achieve a positive BCR or NPV; because of low levels of forecast demand.

Transport project benefits accrue largely via time and vehicle operating cost savings, reflecting faster, more direct and efficient journeys. This sees the scale of benefits driven by freight and passenger journeys. Fewer journeys sees lower benefits, in turn making net benefits difficult to achieve.
The muted results reflect the objectives and problems identified in the Scoping Study, slow population growth and subdued economic activity.

However, our sensitivity analysis does find that the ‘Short South’ road sees promise; as shown above as the ‘+planning’ BCR scenario calculation.

This reflects a scenario with a reduced scope, from four lanes to two lanes, with appropriate passing lanes, noting that this level of capacity will be sufficient to cater for projected demand.

We also assumed complementary land use changes equivalent to 10,000 new housing lots. Once these were factored in, the BCR improved substantially, to reach 1.26.

This sensitivity analysis combined with the safety and other impacts of the existing road alignment suggests that a case for a new, safer and more efficient road could become economical, but would require integrated land use planning and significant development to increase corridor demand for the ‘Short South’ option.

The ‘+planning’ BCR scenario reflects the sensitivity analysis considering integrated land use planning and significant development, however no investigation of the potential to accommodate such a level of housing was performed, therefore the results require further investigation.

**New air connections: Limited costs, major benefits**

\[ \text{\`More planes, more freight\'} \]

<table>
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<tr>
<th>PV Benefits: $90 million</th>
<th>Net revenue: $33 million</th>
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</table>

This non-capital option investigates the net benefits that could accrue through the attraction of new international RPT passenger air connections to Los Angeles Airport (LAX), via a tripartite agreement between the SA Government, Adelaide Airport and an airline.

Our analysis suggests that the route would be profitable for the operator and stimulate (very) high value trade in key South Australian products, including meat, beverage and prepared foods. Despite this, our consultations also suggest that some level of SA Government intervention to de-risk the ramp-up period may be required, to encourage a global airline to commit to the route.

The overwhelming majority of international air freight is carried in the belly of regular passenger aircraft, with comparatively few dedicated air freighters in the global aviation fleet. Our analysis shows that international air freight trade has doubled in South Australia, as new passenger air services have connected directly to new markets, including the Middle East.

Investigations into the feasibility of private sector operations of a new connection between Adelaide and Los Angeles, with three return flights a week, found significant economic benefits through increased freight and wider visitor economy tourism exports. Our analysis also finds that this connection could be financially sustainable. Economic benefits identified include increases in incoming tourism from North America, and travel time savings for South Australia’s heading to the west coast of the USA.

Our consultations also suggest that some degree of SA Government facilitation may be required, to de-risk the ‘ramp up’ period for passengers and freight and to encourage a global airline to commit to the route.

This could take the form of a contingent revenue guarantee, agreements around marketing of the route or other measures.

Our analysis of the financial costs and revenues of operating such a route indicates the route would provide net revenue for the airline – resulting in no cost to Government under the base scenario.

In practice, passenger airline choice can be complex and depends on a number of factors, such as airline reputation, frequent flyers, on-time reliability, and the hassle of transfers.
Rail option: The case for rail has deteriorated, with volumes even lower than previously forecast

A new rail alignment which bypasses the Adelaide Hills would require substantial capital investment, but limited and declining volumes see limited relative economic benefit for the state. Since the last investigation into an alternative rail alignment undertaken in 2010 (The Adelaide Rail Freight Movement Study), demand has been more subdued than previously estimated and capital costs have increased. Operating costs have also now been considered, which were excluded in the 2010 work. While the proposed rail alignment would provide some economic benefits, namely time savings for freight customers, changes in transport costs and reductions in externalities, with the forecast volumes, these benefits are marginal in comparison to the substantial capital outlay required to deliver the project. A new corridor to the north would only become viable with a significant increase in freight rail use, which is unlikely at this time. In the interim, the focus should be on investment in the existing alignment to minimise negative externalities on proximate communities and to increase the overall efficiency of rail freight movements.

With sufficient private sector interest, an intermodal export park could provide improved connectivity and benefits for SA’s south east

South Australia’s three major intermodals are all located to the north of Adelaide; with no operating intermodal facility in the south-east of the state (with the exception of Bordertown). While the BCR and NPV are not positive, our sensitivity analysis and the existence of developed private sector plans for such a facility suggests that it may be financially feasible. With integrated and supportive land use planning and development, this could see the co-location and clustering of related value adding industries. With the economic appraisal assuming the site will facilitate increased rail use compared to road, the analysis identified strong economic benefits relating to road transport cost savings and reductions in road externalities; however these are slightly offset by increased time for freight customers, rail transport costs and rail externalities. In its current form, the benefits fall short of the costs, however sensitivity analysis found that the option may have economic merit if its costs are reduced. Regardless of the economic appraisal results, the feasibility of the intermodal terminal is dependent on private sector interest, with a key enabler being securing an anchor tenant capable of delivering a significant rail contestable freight volume.
GlobeLink Scoping Study findings

The Scoping Study has identified a range of important insights to inform infrastructure and freight policy in South Australia.

1) Unlike to the north and north-east of Adelaide, the National Land Transport Network to the south-east of Adelaide experiences significant transport efficiency, safety and amenity challenges. This is primarily due to the steep road and rail corridors that traverse through the Adelaide Hills and south-eastern suburbs, in proximity to well-established residential areas.

The existing road network has no contiguous motorway link from the south-east to the north, and experiences congestion on the Adelaide plains and bottlenecks around Stirling. There are significant safety issues with heavy vehicles travelling down the hills face zone, and the advent of Higher Productivity Vehicles will only serve to strengthen safety and amenity concerns.

The existing rail corridor through the Adelaide Hills has spare capacity. The slow travel speeds as a result of steep and circuitous alignment, combined with a single stack limitation, impacts upon rail’s competitiveness with road. The noise from operations also impacts upon residents in the Adelaide Hills and on the Adelaide plains.

2) These constraints limit the state’s productivity in the freight transport sector, and impose a cost on movements between Adelaide and the east coast.

3) With spare airside capacity at Adelaide Airport, there is a distinct opportunity to provide more direct connections to new international destinations to open up additional export markets for South Australian producers. When combined with additional seats, these new flights have the benefit of broadening the state’s high value freight and visitor export economy.

4) With recent channel upgrades and spare quayside capacity, the Inner/Outer Harbors in Adelaide are well placed to accommodate increased export trade growth for the state and nation.

5) Several connectivity options to the south-east (road, rail, air and intermodal) were explored to address the above problems and explore opportunities to deliver upon the objectives of GlobeLink. Options include the proposed GlobeLink solution, along with other infrastructure/non-infrastructure alternatives.

6) The original scope of a road bypass to the north and a freight only airport were found to be unviable and were not shortlisted.

7) Preliminary analysis of the shortlisted road and rail alignment options has found that the high cost of such infrastructure will unlikely to be justified based upon assumed population and employment projections.

8) Preliminary BCRs for road and rail options range from 0.08 to 0.21.

9) While the road alignments provide travel time, operating cost and safety benefits, demand is insufficient to justify the investment without integrated changes to land use policy to increase demand.

10) Preliminary analysis indicates that the scale of land use change along new corridors required to support a new road would need to be significant.

11) These corridor and integrated land use options should be considered in the context of South Australia’s long-term infrastructure strategy.

12) In the near term GlobeLink objectives are more likely to be efficiently achieved through targeted upgrades to the existing roads and rail corridors which reduce supply chain costs and increase safety and amenity in ways that are affordable for industry and taxpayers.

13) Given the excess capacity at Adelaide Airport combined with low volumes, a new competing freight airport to the east of the Adelaide Hills is not considered justified.

14) An intermodal facility to the east of the Adelaide Hills has a greater potential than the other shortlisted options to increase accessibility to rail services for businesses in the region, however it will require a bespoke low-cost and scalable solution to improve its prospects of viability.

GlobeLink Scoping Study recommendations

Despite these sobering assessment results – there is a clear and immediate pathway of investment that can deliver the GlobeLink objectives, support the SA freight sector and drive Gross State Product (GSP). This pathway is achieved through key recommendations shown overleaf.
RECOMMENDATION 1
Increases to productivity of the National Land Transport Network to the south-east/Victoria, and the economic contribution that South Australia derives from it, should focus on the existing road and rail corridors for the short-medium term.

RECOMMENDATION 2
As a priority, as funding becomes available, further investigate and develop concept designs and full business cases for:

- Targeted upgrades to key sections of the South Eastern Freeway, Portrush Road, and Cross Road corridors that will address safety issues and deliver improved network efficiency;
- Potential incremental and localised upgrades to the existing freight bypass route to the east of the Adelaide Hills (between Murray Bridge and the Sturt Highway) to address current constraints and accommodate increased levels of Higher Productivity Vehicles; and
- Treatments to the existing rail corridor to reduce noise impacts and other impacts upon residents in the Adelaide Hills and suburbs.

RECOMMENDATION 3
The 'Short South' option between the South Eastern Freeway and the North-South Corridor, in consideration of potential future land use uplift, would only be a long-term possibility and is not a priority for investigation at this time.

RECOMMENDATION 4
The State Government support (in principle) a market-led and scalable approach for intermodal capacity to the east of the Adelaide Hills to increase access to rail for business in the region, and increase demand for rail freight services in South Australia.

RECOMMENDATION 5
The State Government work with Adelaide Airport Limited to attract new direct Regular Public Transport (RPT) airline services, including between Adelaide and the US West Coast, to provide additional high value export capacity and wider economic benefits consistent with Growth State.
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<th>Definition</th>
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<tr>
<td>ABS</td>
<td>Australian Bureau of Statistics</td>
</tr>
<tr>
<td>Adelaide Hills</td>
<td>Region east of Adelaide in South Australia</td>
</tr>
<tr>
<td>Adelaide metropolitan</td>
<td>Consists of LGA regions; Town of Gawler, City of Playford, City of Salisbury, City of Tea Tree Gully, Adelaide Hills Council, Campbelltown City Council, Port Adelaide Enfield, City of Charles Sturt, City of Prospect, Corporation of the Town of Walkerville, The City of Norwood, Payneham &amp; St Peters, The City of Burnside, Adelaide City Council, City of West Torrens, City of Holdfast Bay, City of Mitcham, City of Marion, City of Unley, and City of Onkaparinga</td>
</tr>
<tr>
<td>ARTC</td>
<td>Australian Rail Track Corporation</td>
</tr>
<tr>
<td>ASGS</td>
<td>Australian Statistical Geography Standard</td>
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<tr>
<td>ATAP</td>
<td>Australian Transport Assessment and Planning</td>
</tr>
<tr>
<td>BCR</td>
<td>Benefit-Cost Ratio</td>
</tr>
<tr>
<td>Benefits</td>
<td>Refers to the benefits outlined in Section 7.7</td>
</tr>
<tr>
<td>BITRE</td>
<td>Bureau of Infrastructure, Transport and Regional Economics</td>
</tr>
<tr>
<td>Boring</td>
<td>A method of tunnelling, where boring machines enter at a proposed point, bore through the earth until they have carved out a space for the corridor.</td>
</tr>
<tr>
<td>Capex</td>
<td>Capital expenditure</td>
</tr>
<tr>
<td>CBA</td>
<td>Cost Benefit Analysis</td>
</tr>
<tr>
<td>CBD</td>
<td>The Central Business District of Adelaide</td>
</tr>
<tr>
<td>Clustering</td>
<td>Refers to the geographic concentration of interconnected businesses, suppliers and associated institutions within a particular field linked by commonalities and complementary practices</td>
</tr>
<tr>
<td>Cut-and-cover</td>
<td>A cheaper, shallower method of tunnelling relative to boring, where the surface material is removed, a hole for the tunnel is dug, and then the surface is restored</td>
</tr>
<tr>
<td>DIRDC</td>
<td>Commonwealth Department of Infrastructure, Regional Development and Cities</td>
</tr>
<tr>
<td>Discount rate</td>
<td>The factor used to convert future costs and benefits into current equivalents for the purpose of the economic appraisal</td>
</tr>
<tr>
<td>Double stacking</td>
<td>A form of intermodal freight transport where railroad cars carry two layers of intermodal containers</td>
</tr>
<tr>
<td>DEM</td>
<td>Department for Energy and Mining</td>
</tr>
<tr>
<td>DIS</td>
<td>Department for Innovation and Skills</td>
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<tr>
<td>DPTI</td>
<td>Department of Planning, Transport and Infrastructure</td>
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<tr>
<td>DTTI</td>
<td>Department for Trade, Tourism and Investment</td>
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<tr>
<td>EPA</td>
<td>Environment Protect Authority</td>
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<tr>
<td>Term</td>
<td>Definition</td>
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<td>-------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
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<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GlobeLink freight catchment</td>
<td>Regions where freight demand will be served, or impacted by, changes within the reach of the supply chain study</td>
</tr>
<tr>
<td>GlobeLink infrastructure corridor</td>
<td>The area where potential freight infrastructure supply-side interventions are assessed, also known as the GlobeLink study area</td>
</tr>
<tr>
<td>GlobeLink steering committee</td>
<td>Representatives from key SA government agencies that were engaged through a structured series of workshops This included representatives from DPTI, DEM, DTTI, DIS, PIRSA and ISA (observer only)</td>
</tr>
<tr>
<td>GlobeLink study area</td>
<td>An alternative name referring to the GlobeLink infrastructure corridor</td>
</tr>
<tr>
<td>GOS</td>
<td>Gross Operating Surplus</td>
</tr>
<tr>
<td>Greater Adelaide region</td>
<td>Consisting of LGA regions; Adelaide Plains Council, Light Regional Council, Barossa Council, Rural City of Murray Bridge, Alexandria Council, Mount Barker District Council, District Council of Yankalilla, City of Victor Harbor.</td>
</tr>
<tr>
<td>Gross tonnes</td>
<td>In respect of rail freight, the total mass of a wagon and its payload</td>
</tr>
<tr>
<td>GSP</td>
<td>Gross State Product</td>
</tr>
<tr>
<td>GWA</td>
<td>Genesee &amp; Wyoming Australia</td>
</tr>
<tr>
<td>GVA</td>
<td>Gross Value Added</td>
</tr>
<tr>
<td>HPV</td>
<td>High Productivity Vehicle</td>
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<tr>
<td>IA</td>
<td>Infrastructure Australia</td>
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<tr>
<td>IAAF</td>
<td>Infrastructure Australian Assessment Framework</td>
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<tr>
<td>ILM</td>
<td>Investment Logic Map</td>
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<td>IMEX</td>
<td>Import - Export</td>
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<tr>
<td>ISA</td>
<td>Infrastructure South Australia</td>
</tr>
<tr>
<td>KPI</td>
<td>Key Performance Indicator</td>
</tr>
<tr>
<td>LHS</td>
<td>Left Hand Side</td>
</tr>
<tr>
<td>Load factor</td>
<td>Measures the capacity utilisation of passenger airline transport</td>
</tr>
<tr>
<td>MASTEM</td>
<td>Metropolitan Adelaide Strategic Transport Evaluation Model</td>
</tr>
<tr>
<td>MCA</td>
<td>Multi Criteria Analysis</td>
</tr>
<tr>
<td>Net tonnes</td>
<td>A measure of payload tonnes excluding the tare weight</td>
</tr>
<tr>
<td>NLTN</td>
<td>National Land Transport Network</td>
</tr>
<tr>
<td>Non-stop route</td>
<td>Route that does not contain traffic intersections</td>
</tr>
<tr>
<td>NPV</td>
<td>Net Present Value</td>
</tr>
<tr>
<td>NSW</td>
<td>New South Wales</td>
</tr>
<tr>
<td>PCS</td>
<td>Port Community System</td>
</tr>
<tr>
<td>PIRSA</td>
<td>Department of Primary Industries and Regions, South Australia</td>
</tr>
<tr>
<td>Problem and opportunities</td>
<td>Refers to the seven identified problem and opportunity statements as identified and described in Chapter 6</td>
</tr>
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</table>

GlobeLink Scoping Study, December 2019

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Document Classification: KPMG Public
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
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<tr>
<td>Project Plan</td>
<td>The Project Plan was submitted to DPTI on the 18th January 2019 outlining the process to undertake and deliver the GlobeLink Scoping Study.</td>
</tr>
<tr>
<td>Rapid CBA</td>
<td>As defined in Part C</td>
</tr>
<tr>
<td>Rapid-rapid CBA</td>
<td>As defined in Part C</td>
</tr>
<tr>
<td>RAVnet</td>
<td>An interactive online map system that displays approved heavy vehicle route networks in South Australia</td>
</tr>
<tr>
<td>RHS</td>
<td>Right Hand Side</td>
</tr>
<tr>
<td>RFMS</td>
<td>The ABS 2014 Road Freight Movement Survey</td>
</tr>
<tr>
<td>RPT</td>
<td>Regular Passenger Transport</td>
</tr>
<tr>
<td>SASTM</td>
<td>South Australian Strategic Travel Model - a state wide strategic transport model, developed by AECOM for GlobeLink</td>
</tr>
<tr>
<td>Scoping Study</td>
<td>This report, being a Stage 1 and 2 GlobeLink Business Case delivered by KPMG on behalf of the Department of Planning, Transport and Infrastructure.</td>
</tr>
<tr>
<td>TEU</td>
<td>Twenty-Foot Equivalent Unit</td>
</tr>
<tr>
<td>ULD</td>
<td>Unit Load Devices</td>
</tr>
<tr>
<td>VIC</td>
<td>Victoria</td>
</tr>
<tr>
<td>VOC</td>
<td>Vehicle Operating Costs</td>
</tr>
<tr>
<td>Volume capacity ratio</td>
<td>The existing volume of traffic on a road at a given point in time against that road’s rated maximum capacity</td>
</tr>
<tr>
<td>VOT</td>
<td>Value of Time</td>
</tr>
<tr>
<td>WA</td>
<td>Western Australia</td>
</tr>
<tr>
<td>WEI</td>
<td>Wider Economic Impacts</td>
</tr>
</tbody>
</table>

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Part A: Background and purpose

The economic competitiveness of South Australia has fallen behind national benchmarks in recent decades. This has prompted a drive to identify and realise the state’s economic potential, with ambitious targets to lift the State’s economic growth.

South Australia’s economy is based on agricultural, extractive and value-added manufactured products – which are in high demand around the globe.

The GlobeLink Scoping Study is about identifying how South Australia’s supply chains can be modernised through investment and reform – to connect South Australia’s existing and emerging producers and industries, to global and national consumers.

This Scoping Study applies relevant national and South Australian best practice analysis and appraisal frameworks, identifying:

- South Australia’s existing freight problems and opportunities; and
- Developing, analysing and recommending project and reform options, to proceed to the next stage of development.
1. About GlobeLink

1.1. Introduction

GlobeLink is the SA Government’s policy commitment to a transparent, ground-up identification of South Australia’s current freight transport challenges – and the best infrastructure and reform options to increase trade and investment to drive economic growth and employment.

The GlobeLink policy identified four initial infrastructure elements for investigation, being:

1) A non-stop freight road purposed for heavy vehicles, bypassing the Adelaide Hills;
2) An intermodal export park;
3) A freight railway to replace the legacy Adelaide Hills section of the ARTC track; and
4) A dedicated freight airport to Adelaide’s south-east.

The SA Government policy required these initial reference projects to be assessed alongside the full spectrum of alternative options – ranging from changes in rules, policies or regulations, through to large transport infrastructure projects.

The SA Government has committed to develop a uniting GlobeLink master plan – backed by supporting business cases for individual projects.

KPMG & AECOM are DPTI’s managing planner for GlobeLink – leading the ongoing study process and providing the technical, commercial and economic inputs for the study.

1.2. GlobeLink Scoping Study

This Scoping Study reflects the key elements of the first two stages of the Infrastructure Australia Assessment Framework, including:

- **Part A: GlobeLink context and background** - Analyses the South Australian economy, key trade indicators, the structure and function of national and state freight supply chains; GlobeLink’s objectives and role supporting the wider SA Government Growth State and national economic policy objectives.

- **Part B: GlobeLink problems and opportunities identification** - Identifies, analyses and quantifies the impacts of existing challenges or unrealised opportunities facing South Australia’s exporters, importers, consumers and the wider community.

- **Part C: Analysis of strategic response** - Commencing with a longlist of potential projects and regulatory reforms that could address issues identified in Part B above, this stage applies GlobeLink’s objectives to identify a shortlist of options. These are subjected to detailed technical and economic analysis – using a rapid Benefit Cost Ratio (BCR) to identify the options recommended for further investigation in a detailed business case. These assessments will be outlined in a subsequent report.

- **Part D: Next steps** - Contains key recommendations and conclusions from Stages 1 and 2 of GlobeLink. Stages 3 and 4 would be undertaken subject to the findings of Stages 1 and 2 (i.e. this report).
1.3. GlobeLink objectives

The GlobeLink Scoping Study’s qualification and quantification of problems and opportunities, and interrogation of potential solutions, has been undertaken through the lens of the study objectives. These were developed in consultation with the multi-agency steering committee; and tested and validated with the South Australian freight industry and other users including, manufacturers, importers and exporters. These objectives are:

01. Boost state and national productivity to capitalise on market opportunity over the long term through improved freight system efficiency, connectivity and capacity (29%)

02. Increase and attract new employment and investment within the region and for South Australia (25%)

03. Improve safety and amenity, and achieve social benefits that are considerate of community views (16%)

04. Attract industry and Government partnerships to create affordable outcomes (15%)

05. Optimise the use of existing South Australian Infrastructure (15%)
1.4. Our evidence-based approach to GlobeLink

Overseen by a multi-agency CEO-level steering group, the GlobeLink Scoping Study reflects the principles and structure of the stages 1 & 2 of the *Infrastructure Australia assessment framework* and relevant SA Government policies.

**Key activities – Stage one**

- Define GlobeLink project objectives, study area and initial infrastructure study corridor;
- Review relevant prior work and existing data;
- Develop and validate a ‘whole-of-state’ strategic transport model for South Australia;
- Undertake detailed field work across the GlobeLink catchment to augment existing data;
- Develop robust forecasts of future freight demand; and
- Using these inputs – identify and quantify relevant freight issues in the GlobeLink study area.

**Freight industry and government consultation**

- Key activities governed by Steering Group and departmental officers across the SA Government, including DPTI, DEM, DTTI, DIS and PIRSA to ensure integrity and independence of the process;
- Focused engagement with key transport stakeholders and detailed engagement with individual exporters/ importers and industry associations; and
- GlobeLink Industry Reference Group consultation convened with a large, broad cross-section of key freight stakeholders – which tested and agreed the objectives.

**Key activities – Stage two**

- Development of a ‘longlist’ of potential infrastructure and non-infrastructure interventions;
- Using an objectives-based multi criteria assessment, develop and test initial shortlist options;
- Apply an initial ‘rapid BCR’ to produce final reduced shortlist;
- Undertake initial technical design and high level costing of final shortlist of options; and
- Undertake a detailed rapid BCR to recommend options for detailed study in Stage 3.

**Freight industry and government consultation**

- GlobeLink Industry Reference Group consultation convened with a large, broad cross-section of key freight stakeholders – which tested, and augmented the ‘longlist’ of options;
- MCA and subsequent shortlisting overseen by Steering Group and departmental officers; and
- Focused engagement with key transport stakeholders to develop and refined options.

1.5. Defining ‘GlobeLink’

An important aspect of the GlobeLink Scoping Study has been the definition of two key spatial parameters, being:

1) **The GlobeLink freight catchment**: The regions where freight demand will be served, or impacted by, changes within the reach of the supply chain study; and

2) **The GlobeLink infrastructure corridor**: The smaller area where potential freight infrastructure supply-side interventions are assessed – referred to as the GlobeLink study area.

The GlobeLink freight catchment includes the substantial demand created by household consumers and industry within Greater Adelaide; as well as major exports and domestic freight movements from the Barossa; Murray and Mallee; Limestone Coast; Fleurieu Peninsula and Kangaroo Island; and areas within Victoria’s Wimmera, Mallee and South West Coast regions – and interstate flows.

The GlobeLink infrastructure corridor was initially formed to reflect potential linear and node transport infrastructure options to the north and east of the Adelaide Hills, in a broad arc from Murray Bridge to Truro.

However, following initial analysis of the problems and opportunities, the zone was expanded to allow consideration of potential infrastructure solutions through the Adelaide Hills, including more southerly alignments – which appear better equipped to meet GlobeLink’s overall objectives.
Figure 10: The GlobeLink Study Area

Source: AECOM, National Key Freight Routes (DIRD)
2. SA: Targeting growth

2.1. Introduction

Australia has enjoyed decades of unbroken economic expansion, driven by booming energy and mineral exports, strong population growth and growing service sectors.

However this national growth has not been evenly distributed among the states. South Australia has instead experienced retreating investment and employment, challenging demographics, low consumption and low demand.

The new SA Government sees ambitious economic targets, matched with commitments to align the structure and focus of government toward trade, investment and growth. Key growth policies include:

- **South Australia Growth State**: The South Australia Government is developing an all-of-government, whole of economy strategy, aligning efforts and policies to drive new demand for South Australia’s highest value products, commodities and service exports.

- **Trade and investment attraction**: South Australia has established dedicated trade offices in key Asian and North American markets to facilitate direct access to global consumers and attract investment from key trading partners.

- **20 year South Australia Infrastructure Strategy and 5 year Capital Intentions Statement**: Infrastructure SA is developing an all-of-government infrastructure strategy, aligning infrastructure planning, investment and delivery toward South Australia’s economic and social goals.

- **Defence and space industries**: Record Commonwealth defence investments and related industry development policies aim to develop high-value advanced manufacturing export industries.

These strategies and commitments are united by an intent to attract, enable or catalyse the growth of the South Australian economy.

**GlobeLink** is an important input to the development of the South Australian Growth State and the work of Infrastructure South Australia – identifying how improving South Australia’s supply chains can support wider efforts to unlock South Australia’s economic potential.

2.2. A concentrated population, dispersed production

South Australia is the nation’s fourth largest state by area, covering 983,482 square kilometres, with 3,700 kilometres of coastline. The nation’s most arid state, 42 per cent of South Australia’s land area sustains minimal or no productive use.

South Australia is one of the nation’s most urbanised populations, with more than 80 per cent of its 1.74 million residents residing in the Greater Adelaide region.
Figure 11 shows the shift across South Australia in the decade to 2016 which saw growth of 10.3 and 11.9 per cent in inner and outer metropolitan Adelaide respectively – while the outer areas of the Greater Adelaide region saw around double that growth at 20.0 per cent, over that period⁶.

Figure 11: Population Growth (Percentage), South Australia, 2006 to 2016

Over the same period, regional South Australia’s population remained generally flat, but with some remote regions with very small populations experiencing declines of up to 44 per cent. Figure 12 below shows the distribution of South Australia’s population beyond Adelaide centred on the state’s key productive and extractive regions, mostly clustered close to Greater Adelaide in its immediate north-east and south-east.

Source: Analysis of ABS data⁷

⁶ KPMG analysis of 3218.0 - Regional Population Growth, Australia, 2016-17.
Figure 12: South Australia’s population distribution, 2016

Source:

KPMG analysis of ABS data, 3218.0, 2016 and South Australia Government Regions, see:
REPLAN Economy, 2018, South Australia Input Output Tables; Regional Developments South Australia, Infrastructure Priority Projects Report, 2018; Murray and Mallee Region Plan; RDA Yorke and Mid North; Adelaide Hills, Fleurieu and Kangaroo Island Region in Focus; South Australia Government Regions, South Australia; Training and Skills Commission, 2018; ISA 20 year State Infrastructure Strategy
2.3. Changing exports, imports & trade partners

South Australia’s international trade has changed over time, including types of goods traded and international trade partners. Table 2 shows alcoholic beverages were the state’s highest value export in 2018, with a 61 per cent growth in value versus five years before. Non-beef meat products and copper also show strong growth in value, at 55 and 25 per cent, respectively.9

Refined petroleum (+75 per cent), passenger and freight vehicle imports (+47 per cent and +46 per cent respectively) were the fastest growing imports to South Australia; the former reflecting the 2009 closure of the Lonsdale refinery; the latter coinciding with the more recent departure of South Australia’s motor vehicle manufacturing industry10.

The major exports below have also been identified as key growth areas within South Australia’s working plan to promote industry growth by responding to industry needs and leveraging South Australia’s competitive advantages - the SA Growth State, further discussed in Section 2.4.

Table 2: South Australia’s major import and export merchandise type, by value and five-year growth/decline

<table>
<thead>
<tr>
<th>Major exports</th>
<th>$m 2018</th>
<th>5-yr change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcoholic beverages</td>
<td>1,885</td>
<td>61%</td>
</tr>
<tr>
<td>Wheat</td>
<td>1,382</td>
<td>9%</td>
</tr>
<tr>
<td>Copper</td>
<td>1,170</td>
<td>25%</td>
</tr>
<tr>
<td>Copper ores &amp; concentrates</td>
<td>927</td>
<td>-2%</td>
</tr>
<tr>
<td>Meat (excl. beef)</td>
<td>742</td>
<td>55%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Major imports</th>
<th>$m 2018</th>
<th>5-yr change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refined petroleum</td>
<td>1,295</td>
<td>75%</td>
</tr>
<tr>
<td>Passenger motor vehicles</td>
<td>947</td>
<td>47%</td>
</tr>
<tr>
<td>Goods vehicles</td>
<td>454</td>
<td>46%</td>
</tr>
<tr>
<td>Other ores &amp; concentrates</td>
<td>227</td>
<td>-7%</td>
</tr>
<tr>
<td>Alcoholic beverages</td>
<td>197</td>
<td>2%</td>
</tr>
</tbody>
</table>

Source: Australia’s trade by State and Territory, 2017-2018

South Australia’s trade partners have also changed over time, with China displacing the United States as the state’s single largest trading partner. Figure 13 shows that China now represents 20.5 per cent of total South Australian exports and 17.2 per cent of imports, while the United States captures just 8.1 per cent of exports and 8.3 per cent of imports.

---

9 Australia’s trade by State and Territory, 2017-2018
South Australia’s Department for Trade, Tourism and Investment (DTTI) has recently opened two of the five new overseas trade and investment offices, in order to promote economic engagement and assist businesses in identifying trade opportunities in these international markets. These new offices include:

- Shanghai (Established in November 2018);
- Tokyo (Established in March 2019);
- Kuala Lumpur (planned);
- Dubai (planned); and
- United States (planned).

Figure 13: South Australia’s major import and export partners

<table>
<thead>
<tr>
<th>Major export destinations</th>
<th>$m 2018</th>
<th>% Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>2,522</td>
<td>20.5%</td>
</tr>
<tr>
<td>United States</td>
<td>995</td>
<td>8.1%</td>
</tr>
<tr>
<td>Malaysia</td>
<td>952</td>
<td>7.8%</td>
</tr>
<tr>
<td>India</td>
<td>888</td>
<td>7.2%</td>
</tr>
<tr>
<td>Japan</td>
<td>824</td>
<td>6.7%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Major import origins</th>
<th>$m 2018</th>
<th>% Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>1,746</td>
<td>17.2%</td>
</tr>
<tr>
<td>Singapore</td>
<td>877</td>
<td>8.6%</td>
</tr>
<tr>
<td>United States</td>
<td>844</td>
<td>8.3%</td>
</tr>
<tr>
<td>Japan</td>
<td>771</td>
<td>7.6%</td>
</tr>
<tr>
<td>Thailand</td>
<td>750</td>
<td>7.4%</td>
</tr>
</tbody>
</table>

Source: Australia’s trade by State and Territory, 2017-2018
2.4. SA growth industries

The Hon Steven Joyce – a respected businessman and former New Zealand finance minister (Treasurer) - undertook the independent review of South Australia’s economic and trade performance, a key input to the forthcoming Growth State policy. His report warned against ‘picking winners’, instead suggesting that enabling investment and reform should consider areas of existing or emerging specialisation in South Australia, being:

Table 3: Sectors and markets identified as key growth opportunities for South Australia

<table>
<thead>
<tr>
<th>Sectors</th>
<th>Key markets</th>
<th>Key constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food &amp; Agribusiness</td>
<td>China, USA (US), Indonesia, Japan, the UK and NZ</td>
<td>Freight infrastructure, water access, price, irrigation; environmental conservation; biosecurity; land use; availability of skilled workers; and trade access</td>
</tr>
<tr>
<td>International Education</td>
<td>China, India, Hong Kong, Malaysia, Vietnam, Brazil and Nepal</td>
<td>Weaknesses in the SA VET sector and strong competition from other jurisdictions</td>
</tr>
<tr>
<td>Tourism</td>
<td>NZ, Malaysia, Singapore, India, China, Hong Kong, UK, Europe, USA, Canada</td>
<td>Supporting infrastructure (e.g. accommodation and transport), business capabilities of operators, and access to skilled workforce</td>
</tr>
<tr>
<td>Energy &amp; Minerals</td>
<td>China, USA, South Korea, MENA, NZ, Japan and India</td>
<td>Transport infrastructure, including port access, land access, cost of production, and availability and cost/availability of water and energy</td>
</tr>
<tr>
<td>Defence &amp; Space Industries</td>
<td>USA, Northern Europe, Japan and MENA</td>
<td>Suitably qualified workforce, adequate supply chain capabilities</td>
</tr>
<tr>
<td>High-tech Sector</td>
<td>USA, Japan</td>
<td>IT infrastructure, venture capital and research, entrepreneurial ecosystem</td>
</tr>
<tr>
<td>Health &amp; Medical Supplies</td>
<td>China, Japan, South Korea, the US and Northern Europe</td>
<td>Venture capital and successful local commercialisation of research</td>
</tr>
<tr>
<td>Creative Industries</td>
<td>China, Japan and South Korea</td>
<td>Lack of business and entrepreneurial capabilities of artists and cultural workers</td>
</tr>
</tbody>
</table>

Sectors dependent on transport infrastructure & freight connections to market

Source: Hon Steven Joyce, Review of the SA Government’s International and Interstate Engagement Bodies and Functions, February 2019

The SA Government’s policy response commits to an ambitious three per cent annual economic growth and to close the gap between national and South Australian employment growth figures.

Table 3 above shows that half of the identified growth industries are dependent on transport infrastructure and freight connections to markets.

Infrastructure SA is leading the development of South Australia’s first 20 year State Infrastructure Strategy - a strategy with a dual role for infrastructure, where it will both address growth and be a catalyst for it.

The Strategy is expected to be released in early 2020 and is currently available for public consultation in response to a discussion paper released by Infrastructure SA.

Both this paper and the Joyce Review highlight that infrastructure has a critical role in unlocking economic opportunity through providing access to markets and improving productivity.

A snapshot of four of the key growth sectors which may benefit from well-planned transport infrastructure are explored in Figure 14 overleaf:
South Australia’s specialisation in wine, grain, meat and fresh seafood sees these sectors account for a substantial share of total exports - some 50 per cent share of the State’s merchandise exports.\(^9\) Grain production is unlikely to see step changes in either values or volumes; but other sectors could drive substantial growth through improved connections to global consumers - underpinned by competitive supply chain costs or by further value adding, prior to export.

Improved freight connections will increase South Australia’s competitiveness, through reducing the input costs of transport; can induce demand by connecting to new markets; and may offer step changes in the value of goods sold, for example by connecting directly to high value consumer markets in Asia and North America.

Minerals provide 50.6 per cent of South Australia’s commodity exports; with the state holding 68 per cent of Australia’s economically demonstrated copper; 27.5 per cent of gold; 80 per cent of identified uranium; and 8 per cent\(^{13}\) of identified iron ore.\(^{14}\) 

Mineral exports in value decreased from 2014, slowly rising into 2018, totalling $1.4 billion and 12 percent of the State’s merchandise exports.\(^9\) The sector is expected to grow with projects, including copper and other mineral projects and prospects at Olympic Dam; iron ore deposits in the Eyre Peninsula and Woomera Prohibited Area, and other locations; and conventional and unconventional gas projects in the Arckaringa and other basins.\(^{15}\)

Bulk freight transport is discussed in the following chapter, but with limited mineral export or import volumes within the GlobeLink study area, this forms only an incidental aspect of the Scoping Study. ISA is undertaking work to identify the optimal location of a grains/minerals port on the Eyre Peninsula.

South Australia enjoys an established defence manufacturing industry and supply chain, accounting for around 32 per cent of national defence expenditure. The $35 billion Future Frigates programme and $50 billion Future Submarines programme will see the value of South Australia’s defence industry grow even further.\(^{12}\) 

South Australia has also been selected as the headquarters for Australia’s new Commonwealth Government space agency – charged with developing a domestic industry worth $12 billion and sustaining 20,000 jobs by 2030.\(^{12}\) 

While it is far too early to predict export volumes from this potential growth sector, it will benefit from the same type of effective, reliable and low-cost global supply chains that support broader trade.

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\(^{11}\) AECOM, GlobeLink Demand Forecast, August 2019  
\(^{12}\) BITRE International Airline Activity Annual Publications, 2018.  
\(^{14}\) Hon Steven Joyce, Review of the South Australian Government’s International and Interstate Engagement Bodies and Functions, February 2019.  
\(^{15}\) 20-Year State Infrastructure Strategy Discussion Paper, June 2019
2.5. SA Growth State policy & GlobeLink

The GlobeLink scoping study has been designed to provide an input to Infrastructure South Australia’s (ISA) consideration of freight and transport needs; and supports the objectives of the SA Government’s Growth State, as outlined in Figure 15 below.

Figure 15: GlobeLink supports Growth State & the 20 Year Infrastructure Strategy

The multi-faceted approach outlined in Figure 15 above provides a broad-reaching, long term methodology to address South Australia’s growth challenges, with consideration of infrastructure investment, reform and extensive engagement and collaboration.
2.6. South Australia’s growth challenge

Alongside trade, a sustainable economy is driven by the ‘three Ps’ – population, workforce participation and productivity, areas where South Australia has lagged other mainland states in recent decades. South Australia has seen subdued economic activity, in turn attracting low population growth, sending negative signals for investment and employment – resulting in even more subdued economic activity.

Figure 16 below shows South Australia with the lowest average growth of mainland states over the decade to 2018, at just 1.5 per cent per annum - more than a full percentage point lower than the national average.

Figure 16: Average annual GSP growth between 2008-09 and 2017-18

Forward indicators shown in Figure 17 look more promising for South Australia, with the 2019 budget forecasting a GSP growth rate of 2.5 per cent for 2019-20, followed by growth of 2.3 per cent per annum from 2020-21 through to 2022-23\(^\text{17}\).

The stronger outlook in 2019-20 is due to an expected boost in SA’s winter crop production, assuming a return to more favourable weather conditions\(^\text{18}\).

This substantially narrows the gap between national and South Australian growth prospects, being 0.3 per cent behind forecast national growth.

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\(^{16}\) Analysis of ABS data, 5220.0, Australian National Accounts: State Accounts, 2017-18


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Document Classification: KPMG Public
Figure 17: South Australia GSP annual growth, per cent

Source: KPMG analysis based on publicly available data
2.7. South Australia’s population is slowly growing…but growing older

As discussed in section above, South Australia’s relatively low population growth rate impacts the size of the workforce and as such, the overall composition of the South Australian economy.

Over the last decade, South Australia’s population grew at an average of 0.9 per cent per annum – just above half of the national average of 1.6 per cent per annum.

Figure 18 shows South Australia’s total population growth at a total of circa 17 per cent since the year 2000 – substantially below all other mainland states and around half of the national average of 35 per cent.

Figure 18: Historical population growth by state, overtime and forecast

Source: Analysis of ABS data

South Australia’s population growth rate is projected to slow to 0.7 per cent per annum over the decade to 2028-29 versus national population growth of 1.3 per cent per annum over the same period.

Figure 19 below shows that South Australia’s population is decreasing as a proportion of the national population – and also shows the growth in the proportion of South Australian residents aged above 65 years of age.

Figure 19: 20-year population projections - South Australia

Source: Analysis of ABS data

---

19 Analysis of ABS data, 3101.0, September 2018.
20 Analysis of ABS data, 3101.0, Table 4. Estimated Resident Population, States and Territories (Number)
22 2019 Population forecasts (medium scenario)
23 Analysis of ABS data, 3222.0 Population Projections, Australia
The median age of South Australians is currently some 40-years, two years older than the national average\(^24\). Over the next 20 years, this trend is projected to intensify with the number of residents aged over 65 years expected to increase from around one fifth now, to nearly one quarter of all residents\(^23\).

Figure 20 below shows that the loss of young South Australians through interstate emigration is a key reason for the state’s slow overall growth, and ageing profile. While the 50-64 and 65+ demographics are static, South Australia has experienced an accelerating loss of young and middle-aged residents across this time – in pursuit of economic opportunities on the east coast.

**Figure 20 Net interstate migration by age groups in South Australia from 1999 to 2019 (per annum, total numbers)**

These population shifts have resulted in the erosion of South Australia’s share of the national population pool, limiting the size of its workforce, reducing the prominence of South Australia in the national context and its allocation of federal funding, impacting the overall competitiveness of the state.

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\(^{24}\) Analysis of ABS data, 3235.0, Regional Population by Age and Sex, Australia, 2018.

\(^{23}\) Analysis of ABS data, ERP by SA2 and above (ASGS 2016)
2.8. Reduced private sector investment with a growing public sector, and relatively high unemployment

South Australia’s economy, historically underpinned by manufacturing and agriculture, has been in a transition phase. This is particularly evident when considering the primary employment industries within the state. Historically, South Australia has been a production state. In 1998, 14.1 per cent of the workforce was employed in the manufacturing sector, and 7.2 per cent employed in agriculture. By 2018, manufacturing only represented as 9.2 per cent of South Australia’s labour force, and agriculture 4.6 per cent.  

Over the same timeframe, the private sector has reduced its relative presence in South Australia, with private sector jobs in manufacturing, wholesale trade, agriculture, forestry and fishing seeing the greatest reduction in their employment base. This has coincided with the departure of major manufacturing employers, such as Holden, and Mitsubishi, relocating their operations. 

In contrast, largely public sector or publicly funded jobs in health and aged care, public administration, education and training and other human services have seen the largest relative employment growth in the state, as the public sector has grown to accommodate the ageing population and reduction of private sector employment opportunities.

Figure 21 provides an illustration of the shift in employment by industry over the last 20 years, and demonstrates the impact of the departure of some of the larger manufacturing operations in the state.

Figure 21: Employment change by industry, South Australia, 1999 to 2019 (in Thousands)

Source: Analysis of ABS data

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*Analysis of ABS data, 6291.0.55.003 Labour Force, Australia, November 2018.*

A similar trend is seen in economic activity. Figure 22, adjacent, provides the gross state product (GSP) by industry over the same time horizon, and illustrates the impact of the departure of manufacturing from the state.

A strong private sector is essential for supporting productivity and participation, which in turn drives economic growth. Evident in Figure 23, over the last twenty years, the state has consistently lagged the rest of the country in terms of new private sector investment in capital. While the rest of mainland Australia has enjoyed the benefits of growing private sector investments, South Australia’s cumulative share of private sector investment was only 4.3 per cent over the last decade, where the other mainland states enjoyed between 14.6 (Vic) and 30.9 per cent.

Figure 22 Industry gross value added, South Australia (per cent of total state GVA)

Figure 23 Private capital expenditure by state by volume ($m – indexed)

Source: Analysis of ABS data

Source: Analysis of ABS data
The impact of stagnation of the private sector in South Australia continues to be felt through its unemployment levels relative to the rest of the nation. While some of the reduction in employment in the manufacturing and agricultural sector has been picked up by growth in the public sector and other service-based industries, South Australia continues to experience higher unemployment rates than the national average. South Australia’s unemployment rate was 5.7 per cent in 2018, compared to 4.8 per cent across Australia\(^3\). South Australia’s comparative unemployment rates for the last 20 years are illustrated in Figure 24.

This is particularly the case in youth unemployment, with the unemployment rate for those between 15 and 24 years of age at 15.2 per cent in South Australia - compared to 10.6 per cent in NSW, 11.6 per cent in Victoria and 13.9 per cent in Queensland\(^3\).

Figure 24: South Australian unemployment rate compared to the national average (per cent)

Source: Analysis of ABS data\(^3\)

\(^3\) Analysis of ABS data, 6202.0 Labour Force, Australia, 2018.
3. **SA: Growth connections**

3.1. **Introduction**

Freight transport and logistics connects producers to consumers within Australia and across the world. Transport and logistics contribute circa 14.5 per cent of Australia’s GDP, worth an estimated $150 billion each year.32

Freight is segmented into two broad categories:

- **Bulk freight:** Lower value, unpackaged primary products such as grain, coal, steel and iron ore; and
- **Non-bulk freight:** Typically higher value primary, secondary or tertiary products, usually transported via storage units such as pallets, shipping containers or Unit Load Devices (ULD) for airfreight.

Containerised freight imports are expected to be the largest driver of growth in Australia’s freight task over the coming decades, growing by circa 2.2 per cent per annum out to 2050. Bulk exports are expected to grow at a slower rate of around 1.4 per cent per annum over that period.

3.2. **Freight is shared between the tiers of government…and the private sector**

Supply chains are complex, with no single level of government responsible for freight transport – which is regulated, funded and often operated by different levels of government, which both supports and is complemented by investments by the private sector.

The past 20 years have seen focused efforts by Australia’s governments at all levels to integrate the planning, pricing and drive the competitiveness of Australia’s freight and logistics supply chains.

In 2005, the Commonwealth’s AusLink legislation defined a ‘National Land Transport Network’ (NLTN), in agreement with the states and territories. This provided the basis for a long-term agreement about investment and reform priorities and has seen a substantial ratification of funding arrangements on the NLTN. Figure 25 shows the national freight network, key sea and airport export nodes, which includes the NLTN and other key freight routes.

---

Australia’s Commonwealth and State Governments are currently examining further opportunities to improve the efficiency of freight transport, including through the creation of a new freight ‘observatory’ – using data to produce a much clearer understanding of the costs and performance of Australia’s supply chains; alongside sustained work toward rationalised heavy vehicle pricing regulation and development and implementation of the National Freight and Supply Chain Strategy.

### 3.3. National IMEX trade

Australia’s international imports and exports can arrive or depart the country either by sea or air. This sees international shipping supply more than 98 per cent of Australia’s total trade by mass – and circa 74 per cent of trade by value\(^33\).

While international air freight is only a small part of the freight task by volume – circa one per cent – it represents more than 21 per cent of freight movements when measured by value\(^33\). This sees the value moved by air freight at $136,000 per tonne; whereas the value moved by ship was only $282 per tonne, in 2015-16\(^34\).

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\(^{34}\) Analysis of: BITRE, Australian Sea Freight 2015-16 Statistical Report, 2018; National freight and supply chain inquiry, Supporting Paper No.1, 2018
An overview of Australia’s international sea and air freight is provided below.

**IMEX sea freight**

Sea freight is the dominant mode for international imports and exports, by both volume and value. Australia has the fifth largest shipping task in the world, when considered in terms of tonnes of cargo shipped and kilometres travelled, dominated by bulk resource exports.\(^{35}\) Shipping and ports form a crucial interface with the land transport network, facilitating international trade.

Based on the most recent BITRE international sea freight trade statistics\(^{36}\) in 2015-16, Australia:

- Exported 1,394.5 million tonnes and imported 98.9 million tonnes of freight by weight.
- Exported $218.9 billion and imported $201.8 billion of freight by value.
- The three largest commodity groups exported by value are crude materials, inedible, except fuels ($77.9 billion); mineral fuels, lubricants and related materials ($57.6 billion); and food and live animals ($29.9 billion).
- The three largest commodity groups imported by value included machinery and transport equipment ($78.2 billion); manufactured goods ($27.5 billion); and miscellaneous manufactured goods ($27.2 billion).

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\(^{36}\) BITRE, Australian Sea Freight 2015-16 Statistical Report, 2018

\(^{37}\) AECOM, GlobeLink Demand Forecast, August 2019

\(^{38}\) National freight and supply chain inquiry, Supporting Paper No.1, 2018

\(^{39}\) A broad category which includes goods exported after being imported on a temporary basis (e.g. ships, boats and goods for public exhibition), goods exported on a temporary basis and intended to be re-imported, goods exported for repair, alteration or renovation and intended to be re-imported, passengers’ personal effects for which customs entry is required and goods exported by the Australian Defence Force.

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**IMEX air freight**

Air freight is generally comprised of time-sensitive, high-value or perishable goods. Due to constraints on aircraft size, high costs, and the nature of goods that can be carried, it makes up only a small share of freight volumes by weight.

Passenger flights are a major driver for air freight movements, with up to 80 per cent of air freight being transported in the belly of passenger aircrafts and the remainder on dedicated freighters.\(^{37}\) This sees airports in major population centres, which are able to attract a baseline level of demand and wide-body aircrafts with the higher frequency of services to domestic and international locations, with an advantage to accessing markets in these passenger flight destinations.

Based on the recent submission of international air freight statistics as part of the ‘Inquiry into National Freight and Supply Chain Priorities’\(^{38}\), in 2016 Australia:

- Exported 568,225 tonnes and imported 405,265 tonnes of freight.
- Exported $55.4 billion and imported $77.1 billion of freight.
- The major products exported by value vary from airport to airport. Generally, these include commodities and transactions not in merchandised trade, meat and meat preparations, miscellaneous manufactured articles and professional, scientific and controlling instruments.
- The major products imported by value also vary from airport to airport. Generally, these include commodities and transactions not in merchandised trade, medicinal and pharmaceutical products, miscellaneous manufactured articles and telecommunications and sound recording equipment.
3.4. The domestic freight task

Australia moved a total of 3,440 million tonnes of bulk and non-bulk freight in 2013-14, with Figure 26 showing each transport mode’s share of the overall freight task.

Road moved more than half of all domestic freight, while rail transport accounted for over 32 per cent. Road and rail freight have different features which sees the majority of rail freight made up of ‘bulk’ cargo and the majority of road freight is ‘non bulk’. Domestic coastal shipping moved 1.51 per cent of total freight, whereas aviation plays a very small role in the domestic freight market – less than 0.1 per cent.

An overview of each transport mode in 2013-14 (latest complete data set, across the four modes) is provided below.

<table>
<thead>
<tr>
<th>Transport Mode</th>
<th>Share of Freight</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rail</strong></td>
<td>32.31%</td>
</tr>
<tr>
<td><strong>Road</strong></td>
<td>66.17%</td>
</tr>
<tr>
<td><strong>Shipping</strong></td>
<td>1.51%</td>
</tr>
<tr>
<td><strong>Domestic Air freight</strong></td>
<td>0.01%</td>
</tr>
</tbody>
</table>

**Rail** typically suits high volume bulk commodities, and is competitive with the road for non-bulk freight, over very long distances. Rail freight:
- Carried 32 per cent of Australia’s domestic freight, some 1,111.5 million tonnes per annum.
- Comprised predominantly of bulk products (90 per cent), like iron ore, coal and steel.
- Used for bulk freight movements, is projected to increase by 33 per cent by 2030.

**Road** transport dominates non-bulk freight movements within cities, within states and between capital cities where distances make road competitive. Road freight:
- Carried 66.2 per cent of domestic freight, some 2,276.5 million tonnes per annum.
- Largely comprised of non-bulk freight when measured by tonne-kilometres (77 per cent).
- Used for non-bulk freight transport is expected to grow by 32 per cent by 2030.

**Shipping** plays a fundamental role in import / export movements – but a minor role in domestic freight; and a tiny role in non-bulk domestic freight. Sea freight:
- Carried 1.5 per cent of domestic freight, some 52 million tonnes.
- Comprised largely of bulk commodities (87 per cent), primarily transporting from extraction to production facilities.
- Used to transport bulk, is projected to maintain its volumes, but increase non-bulk freight by an average of circa 2 per cent per annum out to 2030.

**Domestic Air freight** is generally highly specialised, providing high-speed connections for time-critical, perishable, high-value goods. It also provides an important connection to serve remote areas. Air freight:
- Carried 0.01 per cent of domestic freight, some 0.2 million tonnes per annum.
- Used to facilitate non-bulk domestic freight movements is projected to increase by circa 32 per cent by 2030.

3.5. South Australia’s freight task

South Australia’s total freight task moved over 226 million tonnes in 2018 across the various modes, as detailed in Table 4 below.

Table 4: South Australia’s 2018 Freight Task by Mode (Tonnes in thousands)

<table>
<thead>
<tr>
<th></th>
<th>Road</th>
<th>Rail⁴₀</th>
<th>Air</th>
<th>Sea</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>International</td>
<td>-</td>
<td>-</td>
<td>32</td>
<td>27,988</td>
<td>28,020</td>
</tr>
<tr>
<td>Domestic</td>
<td>175,150</td>
<td>11,662</td>
<td>27</td>
<td>11,472</td>
<td>198,311</td>
</tr>
<tr>
<td>Total</td>
<td>175,150</td>
<td>11,662</td>
<td>59</td>
<td>39,460</td>
<td>226,331</td>
</tr>
</tbody>
</table>

Source: AECOM estimated volumes based on source data (RFMS, ARTC, BITRE, Adelaide Airport data)

South Australia’s domestic freight accounts for almost 90 per cent of the state’s overall freight task; with the balance representing direct international trade. South Australia’s domestic freight task serves two core markets, being intrastate (within South Australia) and interstate (to other Australian states and territories, including ‘through’ freight crossing South Australia), with these also playing a role connecting South Australia with international markets via global gateways.

3.5.1. Imports and exports

Figure 27 shows South Australia’s consistent trade surplus, driven by export-focused productive and extractive industries. Exports originating within South Australia have grown at an average three per cent annually over the past decade, though Figure 27 also shows the wide variations in export growth rates, between years.

Figure 27 also shows that South Australia’s trade surplus has been narrowing in the face of strong percentage growth in the value of imports since the global financial crisis. This reflects changes in consumption, alongside the structural changes, like the departure of automotive industries over the past several years.

Figure 27: South Australia merchandise imports and exports, customs/FOB value

Source: AECOM analysis based on ABS 2018 data

⁴₀ Based on interstate movements and converted from gross tonnes to net tonnes using estimated discount factors provided by AECOM.
Manufactured goods like machinery and transport equipment (cars) now comprise the largest proportion (27 per cent) of the state’s imports; followed by mining resources\(^41\) (10 per cent).

South Australia’s major export industries include manufactured products (including the production of alcoholic beverages), mining commodities and agricultural, forestry and fishing products. The concentration of primary and extractive sectors means most of South Australia’s exports are driven by commodities produced in regional areas, underscoring the importance of quality connections from regional points of production to export gateways.

Exports by industry and value for 2016 are presented in Figure 28 below.

\(^41\) Mining resources is defined here to include mining equipment and other resources required for mining; coal mining, exploration and other mining support services, metal ore mining, nonmetallic mineral mining and quarrying, and oil and gas extraction.

\(^42\) Analysis of ABS data, 5220.0, table 24

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Source: AECOM analysis of ABS data\(^42\)
3.5.2. Moving South Australia’s domestic freight

The structure of South Australia’s economy is mirrored in the distribution of freight within the state, across different modes. South Australia’s total domestic freight task was circa 198 million tonnes in 2018; predominantly carried by road, accounting for over 88 per cent, coastal shipping and rail moved similar volumes at 5.8 and 5.9 per cent respectively; while domestic freight by air was negligible by value, at 0.01 per cent, is generally used for goods of higher value. Figure 29 illustrates each transport mode’s share of the overall freight task.

Coastal shipping also plays a larger role in South Australia than nationally, given shipping’s competitiveness for non-time sensitive goods and lower costs.

South Australian rail freight:
- Typically, on the South Australian rail network, consists of steel and grain flows from points of production to points for consumption or export.
- Is dominated by intercity movements, with Perth to Melbourne movements passing through South Australia being the largest of movements within the GlobeLink catchment area.
- By 2040, 93 per cent of rail movements through the GlobeLink catchment area are expected to be Perth to/from Melbourne.

South Australian sea freight:
- Is primarily comprised of iron ore, grain and containerised freight.
- Represents 10.6 per cent of national ship calls, and 5.2 per cent by TEU.
- Coastal shipping has the largest share of South Australian sea freight, including coastal shipping within the state.

South Australian air freight:
- Carries 0.1 per cent of domestic freight, typically restricted to high value, low volume products.
- Total air cargo from Adelaide Airport is expected to grow at an average rate of 2.8 per cent per annum to 2050.
- Adelaide Airport cargo capacity is largely dependent on passenger volumes.

Source: AECOM Demand Forecasting Report, August 2019, BITRE Waterline Reports

**Figure 29: South Australian domestic freight task by transport mode, per cent of tonnes**

- **Rail** 5.9% (26% less than national)
- **Road** 88.3% (22% more than national)
- **Shipping** 5.9% (4.3% more than national)
- **Domestic Air freight** 0.01% (same as national)
3.6. South Australia’s freight network

South Australia is strategically located on the key road and rail freight corridors that connect Australia’s east and west coasts; and the central north-south corridors between Darwin and Adelaide. South Australia is directly connected to global markets through a number of bulk seaports; and by Adelaide’s international airport and Port Adelaide, shown in Figure 30 below.

Figure 30: Map of the South Australian primary freight networks

Source: AECOM, National Key Freight Routes (DIRD)

The largest proportion of South Australia’s inbound and outbound freight movements occur between the Victorian border and Adelaide, underpinned by road freight. These road movements between Victoria and Adelaide make up almost 60 per cent of interstate road freight journeys. Coastal sea freight moving interstate is also dominated by freight moving between South Australia and Victoria at over 30 per cent, whereas rail movements between these states is only slightly behind movements crossing West Australia’s border with South Australia.

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43 AECOM estimates of RFMS data
44 AECOM estimate based on analysis of BITRE Statistical Report, Australian sea freight 2015-16
3.6.1. South Australia’s road freight

Road freight comprises the vast majority of South Australia’s total freight by volume, some 175 million tonnes in 2018 – 84 per cent being within the GlobeLink catchment area. Road freight crossing of South Australia’s border is almost balanced between inbound and outbound journeys, with outbound slightly higher, some 54 per cent.

Figure 31 below shows the destination (or origin) of this outbound (or inbound) road freight crossing South Australia’s borders, reflecting that the dominant interstate freight corridor is between Victoria and South Australia. Intrastate freight transported within South Australia represented a dominant 87 per cent of the total road freight task, in 2018. GlobeLink demand modelling shows 70 per cent of road freight journeys travel less than 200km, over which distance rail is less competitive than road in non-bulk freight markets.

Figure 31: Road freight interstate movements, South Australia

Source: AECOM 2018 forecast of RFMS data
South Australia’s interstate road freight network

South Australian interstate road freight is serviced by highways that form key segments of the National Land Transport Network; and is comprised of freight movements in and out of South Australia and ‘through’ freight connecting other states and territories.

The movement of general freight and food to markets in Victoria and New South Wales drives 42 per cent of interstate road freight movements. Areas of high demand include Western Victoria’s South Coast and Grampians regions; the movement of food products from the Murray Mallee to Victoria’s Lower Murray region; and to Wagga Wagga in New South Wales; as well as movements of machinery and bulk metal ores (excluding steel) to the eastern states.45

As stated above, inbound and outbound freight moved by road is roughly balanced for South Australia. The same is true for the largest interstate market, Victoria, which accounts for almost 60 per cent of the interstate freight movements.

Figure 32 shows GlobeLink’s modelling of major interstate road freight movements from South Australia, based on first road movements, with volumes diminishing sharply over very long journeys, as fuel and other operating costs increase the cost of road transport versus freight rail.

Figure 32: Key interstate destinations for road freight from South Australia in 2015 – first leg only, excluding driver changeover or subsequent stops

Source: AECOM, GlobeLink Stage 1: Demand Forecast, July 2019

45 AECOM, GlobeLink Demand Forecast, August 2019
South Australia’s intrastate road freight

The cost and service advantage of road transport to rail over short distances is reflected in road’s 88.3 per cent share of the total South Australia domestic freight movements by volume. Intrastate movements make up the dominant share of the total road freight movements, some 87 per cent.

Of these intrastate movements, 37 per cent occur within Greater Adelaide, where 90 per cent of movements are less than 30 kilometres long.\(^45\)

Figure 33 shows the urban components of the National Land Transport Network, including constraints on Higher Productivity Vehicles (HPVs) to the south-east.

Figure 33: HPV constraints on national strategic road network

The major road freight corridors to Adelaide’s north and west are each capable of carrying HPVs. Figure 33 above shows that the South Eastern Freeway currently has restrictions on HPVs, where B-Triples are not permitted between Adelaide and Murray Bridge.

Figure 34 overleaf shows the largest flows of intrastate road freight movements by volume, with most movements remaining within the same region (based on ABS SA3 statistical regions).

Sand, stone & gravel and general freight form the largest proportion of road freight volumes; some 35 million and 30 million tonnes respectively, in 2014. Food, cereal grains and cement and concrete form the next largest category of road freight cargoes.\(^46\)
Figure 34: South Australian intrastate road freight movements, 2015

Source: AECOM analysis based on ABS 2015 data, National Freight Routes (DIRD)
**Road network planning and investment**

South Australia is in the midst of a period of transport investment growth, seeking to address urban congestion, regional safety and connectivity and to accommodate and induce growth and development. A selection of some of these initiatives are included in Table 5:

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Description</th>
<th>Impact on freight network</th>
<th>Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Roads of Strategic Importance Program</strong></td>
<td>Circa $275m of works upgrading connecting roads from Port Augusta to Perth; Cockburn to Burra; and Renmark to Gawler.</td>
<td>Improves connectivity of regional businesses to local and international markets.</td>
<td>In planning.</td>
</tr>
<tr>
<td><strong>Urban Congestion Fund</strong></td>
<td>Focused on pinch points and last mile access challenges at export ports, airports; and employment and freight hubs.</td>
<td>Improves network and freight efficiency, travel times, connectivity and reduces congestion costs. Improves safety and network performance.</td>
<td>In planning.</td>
</tr>
<tr>
<td><strong>North-South Corridor</strong></td>
<td>Adelaide’s North-South Corridor is considered South Australia’s highest immediate transport priority. Reaching some 78 km from Old Noarlunga to Gawler, the North-South Corridor connects Adelaide’s CBD, airport and seaport and serves major commuter populations. Once completed, the North-South Corridor will complete a contiguous freeway network across Adelaide.</td>
<td>Completes freeway connections from north to south, including airport and seaport precincts and key business areas. Improved travel times, costs and safety outcomes.</td>
<td>Advanced planning. Funding being sought from Commonwealth for remaining two sections, including the Anzac Hwy to Darlington; and River Torrens to Anzac Hwy.</td>
</tr>
<tr>
<td><strong>Main South Road Duplication – Stage 1</strong></td>
<td>Main South Road at Seaford directly feeds into the completed southern portion of the North-South Corridor. Duplication of 10 kilometres of Main South Road from south of Griffiths Drive in Seaford to Aldinga. This will include the duplication of the Pedler Creek Bridge at Seaford Rise.</td>
<td>Aids in freeway connections from north to south. Improving the corridor to the Fleurieu Peninsula. Improved travel times, costs and safety outcomes.</td>
<td>In planning.</td>
</tr>
</tbody>
</table>

Source: DPTI, Infrastructure Australia

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46 Shortlist only – other road projects in SA have been excluded based on relevance and size.
3.6.2. South Australia’s rail freight

Rail carried circa 11.7 million tonnes of South Australia’s interstate freight volumes in 2018, some 5.9 per cent of the total domestic freight task. Based on analysis of rail freight data within the GlobeLink catchment area provided by ARTC, interstate rail freight is made up of:

- 32 per cent moving to or from Adelaide, majority of which is moving between Adelaide and, either, Perth or Darwin;
- 36 per cent passing through Adelaide, which is almost all freight bound between Melbourne and Perth, with a small amount of steel moving between Whyalla and Melbourne; and
- 32 per cent moving through the state, but does not pass through Adelaide itself, of which almost half is travelling between Sydney and Perth.

Rail freight inbound to, and outbound from South Australia is largely balanced; with inbound freight slightly higher at 51 per cent. Figure 35 provides an indication of these interstate rail freight movements across the origin and/or destination markets, by volumes.

Figure 35: Rail freight movements with South Australia (net tonnes, converted from gross tonnes)

Inbound rail freight into South Australia (% of tonnes)

- VIC: 35%
- NSW: 28%
- NT: 5%
- WA: 32%

Outbound rail freight from South Australia (% of tonnes)

- VIC: 26%
- NSW: 22%
- NT: 6%
- WA: 6%

Source: AECOM analysis of BITRE data, 2017; and ARTC data

47 Using AECOM discount factors
In line with national trends, rail freight in South Australia faces considerable competition from road, as reflected by road’s high share of domestic freight tonnes, at almost 90 per cent. This is due to rail transport’s high fixed costs for track, trains and related operating systems and its inherent inflexibility.

Of the major markets shown in Figure 35 above, almost 20 per cent is bulk freight – and 80 per cent is non-bulk freight moving through intermodal terminals, including freight passing through Adelaide.

This reflects the declining preference for rail to move minor bulk goods over short-to-medium distances, however, over long distances - like those between the east coast capitals and Perth - rail’s low marginal costs make it a competitive modal choice for the transport of non-bulk freight.

### South Australia’s rail freight network

The National Land Transport Network identifies the key freight rail alignments in South Australia, which are shown in Figure 36 below.

**Figure 36: South Australia’s nationally significant rail corridors**

Source: AECOM, demand forecast study 2019 and DIRD, National Key Freight Routes

Adelaide is a key node on the east-west rail corridor linking the eastern states to Western Australia; and the central north-south rail corridor from Adelaide to Darwin. This strategic location presents opportunities in the context of GlobeLink’s objectives; but it also presents practical challenges through load and operating restrictions and negative impacts on communities, particularly in regards to the infrastructure through the Adelaide Hills section of the interstate rail network to Adelaide’s south-east.

South Australia’s interstate rail network comprises two major east-west corridors managed by the Australian Rail Track Corporation (ARTC).
• The Kalgoorlie-Cootamundra corridor runs from Kalgoorlie (WA) to Cootamundra (NSW) via Crystal Brook. The Genesee & Wyoming Australia (GWA) operated Tarcoola to Darwin line branches from the ARTC network at Tarcoola, approximately 600km north-west of Adelaide.

• The Melbourne-Crystal Brook corridor runs from Crystal Brook to Melbourne via Adelaide and Murray Bridge. Crystal Brook is the junction with the Kalgoorlie-Cootamundra corridor.

Trains can be double stacked along the Kalgoorlie-Cootamundra corridor (between Parkes and Kalgoorlie) and from Crystal Brook to Adelaide, however services are limited to single-stacking between Adelaide and Melbourne due to vertical clearance restrictions such as the rail tunnels through the Adelaide Hills, the existing truss bridge at Murray Bridge and a number of bridges and other structures in Victoria.\(^48\)

While it is not clear how much capacity remains on the line, anecdotal evidence identified in the supply chain study suggests that there is upwards of 30 to 40 years of capacity left, assuming some minor upgrades such as passing loop upgrades and additions.

South Australia’s rail freight typically consists of agricultural and mineral products moved from up-country silos and aggregation points to ports for export, and intermodal services carrying containerised goods such as whitegoods, clothing, and processed food and building materials between capital cities.\(^49\)

Figure 37 below shows the volumes traversing key sections of the rail freight network, of which almost a third of South Australian interstate rail freight originates or is destined for Adelaide.

![Figure 37: Inter-capital rail tonnages (gross tonnes) on key line sections](image)

Source: AECOM, demand forecast study, 2019, based on 2017 data

Rail is often central to moving bulk commodities with a heavy export focus. Previously, several sections of the South Australian rail network were dedicated to transporting specific bulk commodity flows, in particular

\(^{48}\) Northern Rail Bypass Scoping Study for RDA (prepared by Tonkin Consulting August 2018)\(^{49}\) Aecom GlobeLink Demand Forecast Study, July 2019
grain, with only a small section of track specific to transporting steel. Smaller volumes of iron ore from mines in the Middleback Ranges are also railed to Whyalla Port for export.

However, anecdotal evidence from the Supply Chain study indicates that, more recently, there has been a shift to road as a preferred mode for bulk movements, preferred for its flexibility and lower costs over short-to-medium distances. An example of this is the recent shift of a major grain handler from rail to road for grain grown on the Eyre Peninsula. Rail services have ceased on Eyre Peninsula, all grain is now carted by road.50

Table 6 below provides a snapshot of the bulk freight movements for steel and grain in South Australia.

Table 6 Snapshot of the bulk freight movements for steel and grain in South Australia

| Steel | Steel is moved from the OneSteel Whyalla Steelworks to steel mills in Newcastle, Geelong, Jindera, Laverton and Sydney. There are also smaller movements from Whyalla to Perth. These volumes are moved along the following rail corridors:
  - Whyalla – Crystal Brook – Melbourne
  - Whyalla – Crystal Brook – Sydney/Newcastle. |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain</td>
<td>Grain harvests (e.g. wheat, barley and oats) being moved from the GlobeLink catchment area to ports - mainly ports in Adelaide and Portland - for export comprise a significant portion of the rail freight task. South Australian grain is grown primarily in the Eyre Peninsula, Mallee and Yorke Peninsula, mid/lower North, Murray and upper south-east regions, of which approximately 85 percent is exported. Grain is transported by road between farms and up-country grain storage facilities, then hauled by rail, primarily to Port of Adelaide for export.</td>
</tr>
</tbody>
</table>

Source: AECOM, GlobeLink Supply Chain Study, July 2019

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50 AECOM, GlobeLink Supply Chain Study, July 2019
Rail network planning and investment

South Australia’s rail system has seen a range of limited investments in recent times, to provide better operational separation between Adelaide’s road and rail networks. A number of other initiatives are in planning stages, designed to increase the load capacity of sections of track. A selection of some of these initiatives are included in Table 7 below:

Table 7: Rail projects and initiatives

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Description</th>
<th>Impact on freight network</th>
<th>Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goodwood and Torrens Junctions</td>
<td>Key junctions placed a major constraint on the freight rail network where passenger and freight lines met, with freight trains forced to give way to passenger trains at the junctions. A nationally significant project was implemented, involving new and upgraded rail infrastructure, as well as grade separations, removing the need for trains on either track to stop and give way.</td>
<td>Increases productivity on the Melbourne-Adelaide-Perth rail line and reduce delays at level crossings within the metropolitan road network. Additionally allows freight trains to safely maintain speed through the level crossings, reducing delays on the road network.</td>
<td>Goodwood Rail Junction Grade Separation (completed December 2013). Torrens Junction Grade Separation (completed March 2018).</td>
</tr>
<tr>
<td>Adelaide - Tarcoola Rail Upgrade Acceleration</td>
<td>The project will upgrade approximately 600 kilometres of track on the Adelaide-Tarcoola rail line by strengthening 1,200 kilometres of rail. The upgrade of this section of the interstate network will allow the maximum axle loading to be lifted from 23 tonnes to 25 tonnes, enabling improvements in productivity for existing services by allowing more efficient freight trains to operate at faster speeds.</td>
<td>Improves productivity and operating performance by enabling a lift in the maximum axle loading. The project also addresses deterioration and failure rates, improving reliability and reducing maintenance expenditure.</td>
<td>Under construction.</td>
</tr>
<tr>
<td>Advanced Train Management System</td>
<td>ATMS will replace traditional trackside signalling across the interstate rail network, using GPS navigation systems, broadband communications and state-of-the-art computer technology to locate and route trains in real time.</td>
<td>Increases capacity on existing rail infrastructure and improves safety through the ability to automatically safely slow and stop a train.</td>
<td>Mobilisation.</td>
</tr>
</tbody>
</table>

Source: DPTI, ARTC, Infrastructure Australia
3.6.3. Sea freight

Sea freight carries the second largest proportion of South Australian freight by mass, some 39.5 million tonnes per annum, or 17 per cent of the total state freight task in 2018. Of this 28 million tonnes is international freight\(^{51}\); the other 11.5 million tonnes are domestic coastal shipping.

Of coastal shipping, circa 7 million tonnes were discharged in South Australia (largely to Melbourne); while 4 million tonnes were loaded from South Australia. Intrastate coastal shipping, with origin and destination within South Australia, was some 1.5 million tonnes; predominantly relating to the shipment of limestone between Klein Point and Adelaide.

Figure 38 below shows the movement of the interstate coastal freight flows by volumes in 2018, and shows Victoria as the largest market for South Australian outbound sea freight.

\(^{51}\) BITRE Statistical Report, Australian sea freight 2015-16
Sea freight is a key import and export gateway for South Australia, in terms of bulk and non-bulk exports. South Australian ports loaded 15 million tonnes and 3.1 million tonnes in bulk and non-bulk freight, respectively; and imported 6.2 million tonnes in bulk and 1.7 million tonnes in non-bulk freight, in 2016-17. Outer Harbor acts as the state’s major gateway for sea freight. Its major trading partners include Europe, the United Kingdom, the USA, Japan, South Korea, South East Asia and the Middle East. South Australia also relies on ports at neighbouring states for sea freight – with freight moving overland and exported via Port Botany and Port of Melbourne. While it is not clear how much of South Australia’s exports travel via these gateways, anecdotal evidence identified in the GlobeLink supply chain study suggests that large volumes of wool and other commodities are moved via Port of Melbourne.

Freight that is land-bridged and exported via interstate ports is usually done so for one of two reasons – due to lower overall transport costs (combining both on-land and shipping costs) or improved number and frequency of connections, opening up more international markets. South Australia’s sea trade has historically been impacted by low numbers of ship calls, with higher bluewater costs and less direct trade. This has somewhat improved in recent years, and the continuation of this trend has the potential to support South Australia moving a greater portion of its exports via its own ports as a result.

**Port infrastructure**

Port of Adelaide is the state’s largest and busiest port, responsible for majority of domestic and international goods exported from South Australia; and 68 per cent of all shipping calls to South Australian ports. It handles all of South Australia’s direct container trade, in the order of 400,000 TEUs – although South Australia’s industries also import and export through Victoria – which potentially handles c. 300,000 TEUs originating in South Australia.

Port of Adelaide and the other major South Australian ports are provided in Figure 39 below.

**Figure 39: Major South Australian ports**

Port Adelaide handles all of South Australia’s direct container trade, in the order of 400,000 TEUs – although South Australia’s industries also import and export through Victoria – which potentially handles c.

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52 Ports Australia Data Input 2015-16 & 2016-17 - Member Ports
53 BITRE, Maritime – Containerised and non-containerised trade through Australian ports to 2032-33, 2014
54 Ports Australia Data Input 2015-16 & 2016-17 - Member Ports
55 Flinders Ports, 2018 Trade statistics
56 KPMG choice modelling estimates
57 Flinders Ports, 2018 Trade statistics
300,000 TEUs originating in South Australia. Figure 40 shows the market share and throughput of Australia’s container ports – with the three major ports handling five out of six containers entering or exiting the country, and Port Adelaide seeing the lowest TEU throughput out of the major ports.

**Figure 40: Throughput of Australia’s five major container ports (2017/18)**

<table>
<thead>
<tr>
<th>Port</th>
<th>TEUs (million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fremantle Port</td>
<td>2.73</td>
</tr>
<tr>
<td>Port Botany</td>
<td>2.74</td>
</tr>
<tr>
<td>Port of Melbourne</td>
<td>1.30</td>
</tr>
<tr>
<td>Port Adelaide</td>
<td>0.8</td>
</tr>
<tr>
<td>Port of Brisbane</td>
<td>0.4</td>
</tr>
</tbody>
</table>

Source: ACCC, 2018

**Capturing contestable freight through Port Adelaide**

A twenty-foot equivalent unit, or a TEU, is a standardised metal container that is 20 feet long. These containers were designed to allow freight to be readily transferred between ships, trains and trucks.

This means containerised freight is cheaper and faster to transport where multi modal or intermodal movements are required, and given the nature of the freight being moved, makes containerised freight contestable between ports.

The number of people per TEU in South Australia is around double of that of Victoria, being four and two respectively. This indicates that the level of containerised freight activity moving through Port of Adelaide is relatively low, and freight operators are favouring importing/exporting freight via Melbourne.

From 2012 to 2017 Port Adelaide’s ship calls have increased by some 32 per cent, which has seen a corollary increase of 23 per cent in TEU throughput at the port. With more connections to international markets, Port Adelaide appears to have been able to gain market share. Measures including the widening of the Outer Harbor channel to attract post-Panamax vessels will further enhance the attractiveness of moving goods through Adelaide rather than through interstate gateways.

Other major economic ports include Whyalla, Port Bonython and Port Lincoln, which handle bulk iron ore, steel products and grain exports. Flinders Ports operates Port Adelaide and Port Lincoln, as well as other regional ports including Port Pirie, Thevenard, Port Giles, Wallaroo and Klein Point; whereas Whyalla port is

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58 ACCC (2018), Container stevedoring monitoring report 2017-18
59 Analysis of ABS demographic statistics, Dec 2019
60 Analysis of Bitre Waterline

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owned and operated by SIMEC. Consultations with industry participants also indicated that various commodities such as wool and meat are moved via land transport networks to or from Port of Melbourne, largely given Port of Melbourne’s comparative size, being significantly larger than that of the Port of Adelaide, as well as the frequency and range of shipping lines calling at the port making it an attractive option for some industries.

**Sea Freight planning and investment**

A notable upgrade for the sea freight sector in South Australia from a selection of initiatives is identified in Table 8 below.

**Table 8: Sea freight projects and initiatives**

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Description</th>
<th>Impact on freight network</th>
<th>Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Widening of Outer Harbor Channel</strong></td>
<td>The Outer Harbor container terminal is the only container terminal in South Australia. The existing channel width restricts newer generations of larger container ships. The project will widen the channel by 40 meters, dredging 1.55 million cubic meters of material.</td>
<td>Allows larger ships, with greater cargo capacity, to service Adelaide.</td>
<td>Recently completed (October 2019).</td>
</tr>
</tbody>
</table>

Source: Flinders Ports, ‘Outer Harbor Channel Widening Project’

3.6.4. Air freight

Air freight, the smallest of the four freight modes, has only 59,300\textsuperscript{64} tonnes of freight moving through Adelaide Airport per annum, or 0.03 per cent of the overall South Australian freight task.

Of this, the majority of air freight volumes being moved is in the form of international air freight, at some 54 per cent, more than half of which is international exports; while the remaining air freight is comprised of domestic air freight at 27 thousand tonnes\textsuperscript{64}, 60 per cent of which is freight leaving Adelaide.

A large portion of international air freight originating in South Australia is moving through neighbouring state’s gateways. Figure 41 shows that of all the contestable air freight generated in South Australia over the period 2010 to 2017, an average of 47 per cent of exports and 9 per cent of imports have been handled by airports located outside of South Australia – predominantly Melbourne and Sydney airports\textsuperscript{65}.

Figure 41: SA international air freight handled at ADL vs other airports

Source: AECOM analysis based on data provided by Adelaide Airport

South Australian cargo is typically trucked or transhipped by air to Melbourne and Sydney Airports to access destinations, service frequencies and offerings not offered by Adelaide Airport – as reflected in Figure 42. Melbourne is often the preferred airport because it is typically within nine hours by truck from South Australia’s key regions, and within reasonable range for shippers and forwarders to offset losses from a lack of connectivity or the availability of consolidation into pallets.

\textsuperscript{64} AECOM, Demand Forecast Report, July 2019

\textsuperscript{65} AECOM analysis of data provided by Adelaide Airport
Almost all air freight moving through South Australian gateways moves via Adelaide Airport, with only limited volumes of air freight flown to or from regional airports, which typically lack appropriate freight handling facilities and equipment, and generally do not receive air services that can easily accommodate freight requirements.

South Australian international exports and imports moving through any of Australia’s airports were 20,900 and 11,000 tonnes, respectively in 2018. As the vast majority of air freight exported through Adelaide is carried on passenger aircraft, Adelaide’s direct air freight export volumes have increased substantially with the addition of new passenger services to the United Arab Emirates and Qatar – illustrated by the step change in export tonnages after 2015, as shown in Figure 43.

Source: AECOM analysis of data provided by Adelaide Airport

Source: AECOM analysis of BITRE 2018b
Singapore is the largest origin/destination of air cargo at Adelaide Airport – however, its market share has declined from 63 per cent to 24 per cent over the last nine years, with the introduction of new services to the Middle East – despite total air freight exports from South Australia to Singapore increasing over this time.

Qatar and the United Arab Emirates (Dubai) are the next largest origin/destinations for Adelaide Airport, and have recently emerged as significant trading partners with South Australia in the last five years with the introduction of new direct flights – particularly for high-value meat and other perishables. Much of this increase has been diverted from Melbourne – with its national share of freight to and from the Middle East having decreased, while Adelaide has gained market share. The availability of new direct services has also seen growing tonnages to/from China (Guangzhou) in the last two years, reaching 6 per cent of the total Adelaide Airport freight task in 2017-18. The introduction of new direct air services to these destinations has coincided with an increase in South Australia’s total air freight exports – both via Adelaide Airport and other domestic airports.

There are currently no direct services carried between Adelaide Airport and North American destinations, which are primarily serviced by Sydney Airport. Imports and exports between South Australia and North America (comprising 11 per cent of total South Australian international cargo) are either trucked or domestically transhipped by air to Melbourne or Sydney Airports for further transport, or transhipped via a third airport such as Hong Kong from Adelaide.

Tonnages and market share by combined origins and destinations at Adelaide Airport are provided in Figure 44 and Figure 45 below.

**Figure 44: Tonnages at Adelaide Airport by combined origin/destination**

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Source: BITRE 2018b

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68 AECOM analysis of Adelaide Airport data  
69 AECOM, GlobeLink Demand Forecast Report, August 2019  
70 Analysis of Adelaide Airport data and BITRE 2019
Figure 45: Market share by combined origins and destinations at Adelaide Airport

Source: AECOM analysis from data provided by Adelaide airport
Domestic cargo tonnages have been declining on average 1.7 per cent per annum, but still account for 46 per cent of all cargo at Adelaide Airport. The large amount of domestic cargo reflects the large number of outbound transhipment volumes to hub airports such as Melbourne and Sydney, which demonstrates the need for domestic transhipment from Adelaide for direct access to some international markets (e.g. North America).

Most of the cargo handled at Adelaide Airport originates from or is destined for South Australia. In 2018, around 35 per cent of the export cargo handled at Adelaide Airport originated from interstate – with 30 per cent originating in Victoria. Around nine per cent of imports at Adelaide Airport are transhipped interstate, with six per cent destined for Victoria. This is presented in Figure 46 below.

Figure 46: Destinations of imports (left) and origins of exports (right) via Adelaide Airport, 2017-18

Air freight serves highly specialised cargo types, which are usually high value, perishable or highly time dependent. In South Australia, 82 per cent of air exports were high value agricultural, food and wine products in 2017-18\(^7\); and in FY17 the value of South Australia’s air freight per tonne was approximately $50,000\(^7\).

Figure 47 provides a breakdown of South Australia’s top commodity exports, by mass in 2018.

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Increasing demand in the Middle East and Asia has driven significant growth in export tonnages of meat and prepared food and beverages. Demand for other commodities, in particular seafood (fish, crustaceans, molluscs) and horticulture (vegetable products) have fluctuated over the years according to seasonal yield. Overall, trends in South Australian export volumes are largely driven by both international demand and local agricultural productivity. Exports from South Australia by commodity from 2011 to 2018 are provided in Figure 48 below.

Source: AECOM analysis from data provided by Adelaide Airport
Aviation planning and investment
A notable initiative for the air freight sector in South Australia is identified in Table 9 below.

Table 9: Air freight projects and initiatives

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Description</th>
<th>Impact on freight network</th>
<th>Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airport East Precinct</td>
<td>Plans for a new cargo terminal operator on the east side of the airport.</td>
<td>Potential to create the opportunities for growth by consolidating freight services in one location, encouraging agents and air freight companies to build their own facilities nearby.</td>
<td>Planning stage.</td>
</tr>
</tbody>
</table>

Source: DPTI and Adelaide Airport
3.6.5. Intermodal

Intermodal terminals play an important role in facilitating the consolidation, storage and transfer of freight between freight modes, in particular to enable transfer between rail and sea, or road. Key intermodal terminals supporting the South Australian freight task are located at Islington, Penfield and Outer Harbor, all of which are located in Greater Adelaide:

- Islington serves as the major domestic standard gauge intermodal terminal, enabling the consolidation of rail services inbound from east of Adelaide to be transformed from 1500 metre single stack to 1800 metre double stack train configuration. 73
- Penfield, operated by SCT Logistics, can exit 1800 metre train services from the network and assemble services for travel to Perth, including double stacking any containers required to be transported on this route. 73

These terminals, on the Adelaide standard gauge network shown in Figure 49 below, are not subject to passenger curfews and facilitate double stacking. 73

Figure 49: Major intermodal terminals in metropolitan Adelaide

Source: National Key Freight Routes, DIRD

The third terminal, Outer Harbor, is situated in the Port of Adelaide, and supports the interchange between rail and road cargo to be loaded for sea freight. This intermodal is IMEX (services imports and exports) and supports the transfer of containers.

Through freight includes a large volume of rail-based intermodal goods travelling to and from gateway ports. While no assessment has been made of the capacity of South Australia’s intermodal facilities, insights drawn from the GlobeLink Scoping Study indicate that the intermodals are currently operating below capacity with no foreseeable capacity constraints in the near term.

Table 10 below sets out the throughput at each intermodal:

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Operator</th>
<th>Annual Throughput (TEUs)</th>
<th>Short term capacity (TEUs)</th>
<th>Services per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Islington</td>
<td>PN</td>
<td>150,000+</td>
<td>400,000+</td>
<td>32+</td>
</tr>
<tr>
<td>Penfield</td>
<td>SCT</td>
<td>30,000+</td>
<td>100,000+</td>
<td>8+</td>
</tr>
<tr>
<td>Gillman*</td>
<td>Kerry Logistics</td>
<td>20,000+</td>
<td>100,000+</td>
<td>10+</td>
</tr>
<tr>
<td>Outer Harbor</td>
<td>Flinders</td>
<td>50,000+</td>
<td>100,000+</td>
<td>10+</td>
</tr>
</tbody>
</table>

*Now closed and leased by GWA.

Source: Department of Infrastructure and Regional Development, May 2017

The key features of each of these terminals are listed in the Table 11 below:

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Links</th>
<th>1800m trains</th>
<th>Volume</th>
<th>Freight DCs &amp; warehouses</th>
<th>Domestic / International</th>
</tr>
</thead>
<tbody>
<tr>
<td>Islington</td>
<td>Adelaide – east and south</td>
<td>Yes</td>
<td>Med</td>
<td>No</td>
<td>Domestic</td>
</tr>
<tr>
<td>Penfield</td>
<td>Adelaide – north and west</td>
<td>Yes</td>
<td>Low</td>
<td>Yes</td>
<td>Both</td>
</tr>
<tr>
<td>Gillman*</td>
<td>Adelaide – north and west</td>
<td>Yes</td>
<td>Low</td>
<td>No</td>
<td>Both</td>
</tr>
<tr>
<td>Outer Harbor</td>
<td>Port of Adelaide</td>
<td>No</td>
<td>Low</td>
<td>No</td>
<td>IMEX</td>
</tr>
</tbody>
</table>

*Now closed and leased by GWA.

Source: Department of Infrastructure and Regional Development, May 2017

74 AECOM, GlobeLink Supply Chain Study, July 2019
75 AECOM, GlobeLink Supply Chain Study, July 2019
PART B: SA’s freight problems & opportunities

This section identifies and analyses where GlobeLink’s objectives are, or will be, constrained, by business-as-usual – and provides a basis to gather evidence to quantify the magnitude and impact of supply chain problems in the GlobeLink study area.

To align with national and SA Government infrastructure assessment processes, we have integrated field work with the supply chain, alongside detailed desktop research to identify, refine and test a series of ‘problem & opportunity statements’.

These have been tested with a wide selection of freight industry stakeholders – and overseen by the GlobeLink Scoping Study steering committee and departmental officers.

The GlobeLink problem and opportunity statements provide a series of hypotheses based on wide inputs – which are then investigated, allowing the size of identified challenges to be measured and evidenced.
4. A measured response: Finding, evidencing freight problems

4.1. Introduction

Best practice national and state infrastructure assessment frameworks require a clear articulation of measurable ‘problem definition statements’ to support new infrastructure initiatives, like GlobeLink. These problem statements serve as ‘hypotheses’ that are then subject to detailed analysis to identify, validate and quantify the scale and cost of business as usual.

Figure 50 below shows GlobeLink’s problem and opportunity statements. These were developed through direct engagement with key freight industry stakeholders, departmental officials and the GlobeLink steering committee. Problem statements are ranked by the priority afforded by key departmental and industry stakeholders.

Figure 50: The GlobeLink problem and opportunities to freight induced productivity

- **Better connectivity between key freight gateways, interstate freight networks and SA’s growth areas would attract new industries, private sector investment and support employment growth in South Australia**
  - Stakeholder prioritisation: 40%

- **Freight movements to, through and from Adelaide traverse complex topography and built up residential areas, or follow steep gradients and sharp curvatures, reducing the speed and efficiency of freight movements, which in turn impacts the commuter network**
  - Stakeholder prioritisation: 20%

- **Improving frequency and access to services at Adelaide’s air and sea ports would improve South Australia’s export potential and connectivity to global markets**
  - Stakeholder prioritisation: 15%

- **Co-locating and clustering of industries and supply chains will create an opportunity to grow South Australia’s emerging industries**
  - Stakeholder prioritisation: 10%

- **South Australia’s primary road and rail freight routes traverse through the Adelaide Hills and arterial and suburban areas of metropolitan Adelaide, increasing safety risks and adversely impacting the liveability of local residential areas**
  - Stakeholder prioritisation: 10%

- **South Australia’s primary road and rail freight routes traverse through the Adelaide Hills and arterial and suburban areas of metropolitan Adelaide, increasing safety risks and adversely impacting the liveability of local residential areas**
  - Stakeholder prioritisation: 5%

As a result of addressing the above problems, or realising the opportunities, nine benefits were identified. Benefits, in this context, are the benefits to the community, government, state and Australia that are sought.
4.2. Freight network connectivity and growth

**HYPOTHESIS:**
Better connectivity between key freight gateways, interstate freight networks and South Australia’s growth areas would attract new industries, private sector investment and support employment growth in South Australia.

Modern, efficient and low cost freight connections underpin competitive and profitable businesses, in turn driving demand, employment and investment. Items considered include:

- The adequacy, capacity and shape of South Australia’s freight infrastructure;
- The profitability of South Australian industries versus interstate peers; and
- The cost of freight transport to Adelaide’s south-east.

**South Australia’s freight networks connect well to Adelaide’s north; but are fragmented to the south-east**

Upgrades to Northern Expressway, South Road Superway and Port River Expressway sees South Australia with relatively good road connections between productive regions, interstate trade and traditional manufacturing regions in the city’s north and Adelaide’s port precinct.

The completion of the Northern Connector creates a contiguous connection to the North-South Corridor and Port River Expressway, which connects to Outer Harbor— as shown in Figure 51 below. These areas house an increasing concentration of South Australia’s transport and manufacturing industries.

Adelaide’s northern road and rail freight corridors provide relatively unconstrained connections to interstate markets in New South Wales, Queensland, the Northern Territory and Western Australia.

**Figure 51 Location of key motorways and intermodal facilities in Adelaide**

Source: National Key Freight Routes, DIRD
While Adelaide now enjoys a contiguous connection between industries, export hubs and regions to the north; the south-east remains relatively poorly connected – due to the operating restrictions to road and rail transport through the Adelaide Hills; and the absence of a motorway-grade road connection through Adelaide itself – forcing the majority of South Australia’s freight to travel through suburban arterial roads.

There is only one operating intermodal terminal between Adelaide and the south-east of the state, despite the region’s large bulk agricultural production and the proximity to ARTC’s freight rail network. By way of contrast, the Bowmans Rail terminal to the north-west of Adelaide and terminals at Dooen in western Victoria and Merbein, Tocumwal and Hayfield in the Riverina regions of Victoria and NSW have been successful in attracting regional containerised freight for export and supporting value-add industries.

**Freight movements to/from the south-east needs modern connections to Greater Adelaide**

The regions to Adelaide’s south-east include key growth industries including manufacturing, food and wine, agriculture, forestry, seafood, meat, livestock and grain.

Figure 52 shows AECOM’s analysis of intrastate road freight demand and types in South Australia, where the thickness of the line relates to the intensity of freight movements. This shows the heaviest demand for intrastate freight occurs within Adelaide and regions to the south-east, with net movements into Adelaide.

**Figure 52: South Australian intrastate road freight movements, 2015**

The topographical barrier created by the Adelaide Hills sees unfavourable grades and alignments for both road and rail freight; and once in metropolitan Adelaide, heavy vehicles operate along suburban arterial roads, commingled with general commuter traffic, signalised intersections, pedestrian crossings, all adding additional time to journeys.
South Australian industries are less profitable than their counterparts in other states, creating a disincentive for private investment

Analysis of industry gross operating surplus (GOS) indicates that profits for South Australian industries are generally lower when compared to Australia as a whole – even in industries that are a natural specialisation for South Australia, like wine production. Table 12 analyses the gross operating surplus of key industries in the GlobeLink study area, relative to the national average.

Table 12: Average industry gross operating surplus as a proportion of output value for selected industries

<table>
<thead>
<tr>
<th>Industry</th>
<th>National</th>
<th>SA’s south-east regions (average, relevant regions)</th>
<th>Variance to national</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meat &amp; meat product manufacturing</td>
<td>2.3%</td>
<td>2.2%</td>
<td>-0.1%</td>
</tr>
<tr>
<td>Fruit &amp; vegetable manufacturing</td>
<td>7.5%</td>
<td>4.6%</td>
<td>-2.9%</td>
</tr>
<tr>
<td>Wine, spirits &amp; tobacco manufacturing</td>
<td>19.9%</td>
<td>12.4%</td>
<td>-7.5%</td>
</tr>
<tr>
<td>Beer manufacturing</td>
<td>26.9%</td>
<td>21.3%</td>
<td>-5.6%</td>
</tr>
<tr>
<td>Sheep, grains, beef &amp; dairy cattle</td>
<td>28.5%</td>
<td>28.5%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Poultry &amp; other livestock</td>
<td>54.0%</td>
<td>52.8%</td>
<td>-1.2%</td>
</tr>
<tr>
<td>Other Agriculture</td>
<td>42.8%</td>
<td>40.5%</td>
<td>-2.3%</td>
</tr>
<tr>
<td>Sawmill Product Manufacturing</td>
<td>11.7%</td>
<td>9.7%</td>
<td>-2.0%</td>
</tr>
<tr>
<td>Other Wood Product Manufacturing</td>
<td>11.7%</td>
<td>9.9%</td>
<td>-1.8%</td>
</tr>
<tr>
<td>Pulp, Paper &amp; Paperboard Manufacturing</td>
<td>8.5%</td>
<td>4.7%</td>
<td>-3.8%</td>
</tr>
<tr>
<td>Forestry &amp; Logging</td>
<td>34.0%</td>
<td>32.9%</td>
<td>-1.1%</td>
</tr>
<tr>
<td>Wholesale Trade</td>
<td>17.2%</td>
<td>17.1%</td>
<td>-0.1%</td>
</tr>
<tr>
<td>Motor Vehicles &amp; Other Transport manufacturing</td>
<td>1.9%</td>
<td>0.5%</td>
<td>-1.4%</td>
</tr>
<tr>
<td>Accommodation</td>
<td>17.7%</td>
<td>11.6%</td>
<td>-6.1%</td>
</tr>
<tr>
<td>Health Care Services</td>
<td>11.6%</td>
<td>11.5%</td>
<td>-0.1%</td>
</tr>
</tbody>
</table>

Source: REMPLAN Economy, 2018, South Australia Input-Output Tables

Naturally, lower profit margins reduce the signal for business to make large-scale investments – meaning, initiatives to address industry costs and profitability will naturally generate signals for investment and growth. In the absence of increasing freight volumes which could provide the necessary scale to attract private investment and increase employment; freight improvements that lower supply chain costs, could reap benefits to industries in the GlobeLink catchment area by improving profitability which, in turn, may attract investment.

**Improving connectivity to Adelaide’s south-east could reduce costs and contribute to improved profitability of certain industries**

The transport multiplier for South Australia, an indication of the relative output from an investment in transport, is estimated at 1.3 in 2018. This means that if transport output increased by $10 million, then it could stimulate additional output of $13 million from subsequent activity. For road transport specifically, the multiplier is slightly higher at 1.4. However, at a regional level, the potential for wider economic impacts is more muted. The Murray and Mallee, along with the Barossa regions both have a transport multiplier of 0.7.\(^6\)

The employment multiplier for transport is estimated at 1.3.\(^6\) This indicates that for every one job added in the transport sector, approximately 1.3 jobs could be added in other sectors from direct and indirect effects.

\(^6\) REMPLAN Economy, 2018, South Australia Input-Output Tables
**Case study:** Transport cost impacts by improving HPV access from the south-east

HPVs (Higher Productivity Vehicles) are truck and trailer combinations that provide the ability to shift more freight, more efficiently.

**Table 13: HPVs used for analysis**

- **B-Doubles** are permitted along the South Eastern Freeway.
- **B-Triples** are not permitted on the South Eastern Freeway, but access Adelaide by diverting north via Mannum Rd.
- **BAB quads** are not permitted access into Adelaide (only permitted moving north from Port Augusta and Orroroo).

For safety reasons, HPVs larger than B-Doubles are forbidden from accessing the steep, long gradients on the South Eastern Freeway’s route into Adelaide or the suburban arterial roads beyond, forcing larger HPVs to instead divert some 127 kilometres to the north; entering Adelaide via the Sturt Hwy.

The adjacent graph shows KPMG’s modelling of the price impact, using larger HPVs to operate along the GlobeLink reference route (Murray Bridge to Port of Adelaide via Truro) – which is some 90 kms longer than the existing South Eastern Freeway route.

These results are an early indicator that the initial GlobeLink reference route faces challenges addressing fundamental GlobeLink objectives; showing even using larger B-Triples, the additional distance increases costs by 8 per cent, compared to a smaller B-Double on the existing South Eastern Freeway.

The initial GlobeLink corridor only becomes competitive, once the (massive) efficiencies of a BAB quad configurations are assumed. These (massive) four-trailer vehicles see theoretical cost savings of circa 18 per cent.

In practice, it is hard to imagine BAB quads operating between Adelaide and Melbourne in large numbers – and likely that they would pose significant challenges safely accessing Adelaide’s road freight network to reach the concentration of transport and manufacturing along the North-South Corridor; or Outer Harbor.

A shorter, more direct route, capable of accommodating larger HPVs safely, would be much more likely to deliver step changes in productivity and meet wider GlobeLink objectives.

The analysis also assessed the use of B-Doubles on the GlobeLink road reference route, finding that for the route (which is rather long, with an additional 90 km compared to the current route), B-Doubles do not provide any productivity improvements (with an estimated cost increase of 8 per cent).

Source: KPMG analysis
Key Findings

• South Australia’s road freight sees comparatively good connections to Adelaide’s north, but poor connections between the South Australian border, the State’s south-eastern regions and through Greater Adelaide.

• Even in specialised industries, South Australian businesses generally face higher transport costs and operate with lower profits, than interstate peers.

• Most inter and intrastate freight movements occur between Adelaide and the Victorian border, where connectivity constraints, particularly in the Adelaide Hills, impose higher transport costs.

• Higher Productivity Vehicles larger than B-Doubles operating between the Victorian border and Greater Adelaide face long diversions and are prohibited west of the South Eastern Freeway.

Consideration for Part C – Strategic options

• Improved road access for Higher Productivity Vehicles from Adelaide to the south-east and Victorian border could improve transport and firm productivity.

What are the benefits?

Addressing the freight network connectivity and growth challenges identified will support the following benefits:

1. Improves competitiveness
2. Improved access
3. Improved confidence
4. Supports employment
5. Increases GVA
6. Reduces consumer costs
7. Better amenity & safety
4.3. Road and rail network efficiency

**HYPOTHESIS:**

Freight movements to, through, and from Adelaide traverse complex topography and built up residential areas, or follow steep gradients and sharp curvatures, reducing the speed and efficiency of freight movements, which in turn impacts the commuter network.

The land transport connections between Adelaide and the south-east see increased generalised costs for freight and the community, posed by:

- The use of arterial roads exposing freight and other transport movements to congestion.
- Steep declines along the South Eastern Freeway, resulting in speed restrictions, and increased transport costs.
- The Adelaide Hills rail corridor imposing speed and height restrictions on the Melbourne-Adelaide-Perth interstate freight corridor.

These three components are explored in the sections below.

**Using suburban roads as national freight corridors sees higher costs**

Road freight entering Adelaide from the south-east will generally head north along Portrush Road and Grand Junction, or west along Cross Road to join the North-South Corridor at South Road. Cross Road and Portrush Road are suburban arterial roads, seeing heavy freight vehicles operating amidst an environment of general traffic, parked vehicles, pedestrians, cyclists and using corridors that have sensitive land uses including housing, schools and shopping precincts. There is sustained progress by the Commonwealth and State Governments in delivering the North-South Corridor, with the challenging central sections yet to be completed.

This sees negative impacts, including:

- **Freight is impacted by Australia’s slowest traffic:** Adelaide has the highest level of car dependence and lowest level of public transport use of the five mainland capitals77 – and sees the slowest overall road travel times at some five and ten km/h slower than Sydney and Melbourne, respectively.78
- **Stop-start traffic:** Heavy vehicle operating costs are increased by the additional fuel, time and vehicle wear caused by operating in suburban environments. A heavy vehicle accessing Adelaide from the South Eastern Freeway can encounter 35 sets of traffic lights before reaching Outer Harbour.79
- **Freight is impeded by slow moving public transport and cyclists:** Unlike other major capital cities in Australia, without a contiguous motorway, Adelaide’s freight movements are slowed by, and in turn further slow, traffic. This sees freight vehicles using local roads to find the path of least resistance, thereby competing with traffic on routes also used by public transport, as well as cyclists. For example, four public and three school bus routes use Portrush Road80; while four public and four school bus routes use Grand Junction Road.80

Adelaide is unique among Australia’s major capitals by virtue of around half of its key urban freight routes operating along ordinary suburban roads – and unlike other capitals, having no motorway-grade road connection through the capital city itself.

This sees Adelaide having the lowest average traffic flow speed81 out of all the capital cities arterial roads in 2018, at less than 60 km/h.82 Adelaide also has the third most variable network82, behind Sydney and

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77 ABS Feature Article: Journey to Work in Australia, see; https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/2071.0.55.001~2016~Main%20Features~Feature%20Article:%20Journey%20to%20Work%20in%20Australia~4
76 Road Congestion in Australia, Australia Automobile Association 2018
79 Analysis of google maps (street view)
80 Adelaide Metro
81 Average observed speeds over a number of hours in an overnight period (i.e. congestion-free speeds)
82 Road Congestion in Australia, Australia Automobile Association 2018
Melbourne, impacting the reliability of travel times to freight nodes along arterial roads. Travel time delay on Adelaide’s roads is as high as 26.5 per cent, with the highest travel time delay occurring on Portrush Road. Figure 53: Average traffic flow speeds by state

Source: Data provided by Australian Automobile Association

Traffic modelling for GlobeLink in Figure 54 and Figure 55 shows Adelaide’s existing congestion during peak periods, using a volume capacity plot – and how this will worsen over the two decades to 2036. A volume capacity plot indicates the volume of traffic on a road at give point in time against that roads rated maximum capacity. Figure 54 includes the road network in its current state (as of 2016), with Figure 55 including the completion of a grade separated and at motorway connection on the North South Corridor.

Figure 54: 2016 road network AM volume capacity plot  
Figure 55: 2036 road network AM volume capacity plot

Source: AECOM transport model forecasts, July 2019
Figure 56 shows morning peak truck volumes in Adelaide in 2036, demonstrating the importance of the North-South Corridor – and the natural drift of trucks across from South Eastern Freeway to avoid heavily congested inner urban areas shown in Figure 55.

**Steep grades along the South Eastern Freeway see slower road freight speeds, higher costs**

The South Eastern Freeway’s steep decline into Adelaide sees heavy vehicle speeds restricted to 60km per hour, versus 90km per hour for general traffic. In practice, safety often demands even slower descents using low gears from Crafers Interchange to the western terminus of the freeway at the base of the Adelaide Hills. This section of the corridor is subject to heavy vehicle speed restrictions as shown in Figure 57.

Long, steep declines and inclines increase fuel consumption, increase wear and tear and increase brake wear. Prevailing transport guidance indicates that for a B-Double, vehicle operating costs on an 8 per cent grade – like that on the South Eastern Freeway, increases vehicle operating costs per kilometre by 149 per cent.

For example, each B-Double journey from the intersection of Portrush Road and Cross Road, to the highest point on the South Eastern Freeway, sees the grade add an additional $14.30 per trip. This equates to a daily cost of $62,920 across the circa 4,400 heavy vehicles that traverse the South Eastern Freeway on average each day – costing South Australia $22.9 million per year.

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85 South Eastern Freeway - Road Corridor Overview
86 TfNSW Principles and Guidelines for Economic Appraisal of Transport Investment and Initiatives, June 2018
Figure 57: Location of travel speed restrictions for heavy vehicles on South Eastern Freeway

Source: Infrastructure SA

The Adelaide Hills make freight rail even less competitive

The Adelaide Hills rail alignment, shown in Figure 58, is among the tightest and steepest main railway corridors still operating in Australia. From the centre of Adelaide to Murray Bridge the existing alignment has 208 ‘significant’ curves, of which 153 have a radius of less than 400 metres.

Figure 58: Adelaide Hills section of the Melbourne-Adelaide rail corridor

Source: National Key Freight Routes, DIRD

Freight trains on the interstate corridor between Melbourne and Adelaide face 40 km per hour speed limits on many segments; and 25 km per hour limits through some tunnels sections. Actual operating speed are even lower, due the steep gradients and tight curves. An average freight train will average 27 km per hour, taking 45 minutes to reach from Adelaide to Mount Lofty; a journey only 20 km long, but reaching 492 metres above sea level. This requires 50 per cent more locomotive power per tonne than on other interstate rail freight corridors, meaning higher costs.

Targeted investment has lifted allowable train lengths to 1,800 meters on the Adelaide-Melbourne corridor in recent years; but limited clearance in the Adelaide Hills tunnels and overhead obstructions across the Victorian border prevent ‘double stacking’. This sees double stacked freight trains operating between WA, the NT and Adelaide forced to unstack/restack at the Dry Creek intermodal, before continuing; imposing an additional three hour ‘dwell time’ on rail freight journeys.

The tunnels through the Adelaide Hills provide 4.2 metre clearance – well below the 6.7 metres required for double stacked freight rail. The Adelaide Hills are the largest, but not the only limitation on double stacking.
between Adelaide and Victoria. Hundreds of overhead structures also exist on the Victorian side of the border, adding hundreds of millions of costs, alongside the billions likely needed to reroute the Adelaide Hills rail corridor. KPMG’s analysis shows the Adelaide Hill’s rail alignment adds approximately $27 per container for a round trip between Melbourne and Adelaide; but the limited volumes of rail freight limits the costs of rail constraints to a modest $12.4 million per year.96

Key Findings

- Freight entering Adelaide from the south-east operates on suburban roads, among Australia’s slowest moving traffic
- Substantial investments are planned to complete Adelaide’s North-South Corridor
- The South Eastern Freeway speed limits B-Doubles and prohibits larger HPVs, imposing higher costs on South Australia’s most valuable freight corridor
- Limitations on the Adelaide Hills rail corridor slows journeys, increases costs and prevents ‘double stacking’ of trains between Adelaide and Victoria, increasing journey times

Considerations for Part C – Strategic Options

- Avoiding the steep grades of the Adelaide Hills could see supply chain savings
- Short, direct motorway grade connections between the south-east and Adelaide’s planned North-South Corridor should be considered alongside the reference corridor
- An alternative rail bypass of the Adelaide Hills could improve productivity of rail freight, but rail’s low volumes are unlikely to justify it in the medium to long term; and it may not be in the interests of South Australia

What are the benefits?

Addressing the road and rail network efficiency challenges identified will support the following benefits:

1. Improves competitiveness
2. Improved access
3. Improved confidence
4. Supports employment
5. Increases GVA
6. Reduces consumer costs
7. Better amenity & safety

96 AECOM, GlobeLink Stage 1: Demand Forecast, August 2019
4.4. Connectivity to global markets through Adelaide’s international gateways

**HYPOTHESIS:**

*Improving frequency and access to services at Adelaide’s air and seaports would improve South Australia’s export potential and connectivity to global markets.*

Adelaide’s air and sea ports are the state’s major gateways to global trade – meaning that the frequency of services is essential to serve export demand. But the challenges facing freight movements through the two gateways differ markedly.

Adelaide’s airport sees very low volumes of freight relative to other capital cities, principally because of a lack of direct wide-body international Regular Passenger Transport (RPT) flights or dedicated domestic freight aircraft services.97

Adelaide’s sea port has seen a substantial increase in ship calls in recent years, but continued investment may be required to maintain these gains.

**Few planes = limited volume = constrained investment**

Air freight serves the highest value goods, like fresh meat, seafood, horticultural produce and other perishable or time sensitive goods. Most global and domestic air freight travels in the belly of RPT flights; but Adelaide has the lowest number of international connections of any major capital – and sees only limited daily domestic services.

Historically low volumes have supported limited investment in air freight infrastructure, seeing limitations on the ground, as well as in the air. One example is Adelaide’s single main deck loader, which has an operating limit of 14 tonnes – half the weight limit of the equipment at Melbourne – forcing higher load air freight to travel by truck to Victoria for export. 98

Consequently, around half of South Australia’s air freight is exported from elsewhere; and freight moved through Adelaide airport is via flights which are passenger driven, with freight as a secondary input.

In 2018, 52 per cent of South Australian air freight exports departed via Adelaide Airport, with 30 per cent via Melbourne and 15 per cent via Sydney99.

Adelaide Airport is planning a major realignment of freight infrastructure in its new Master Plan, via a dedicated freight hub termed ‘Airport East’100. Supply chain interviews suggest that substantial lifts in air freight demand would be required, to support dedicated investment in cold-chain stores and handling facilities.

Figure 59 below shows international air freight exports through Adelaide Airport in the decade to 2018; showing a near doubling in air freight volumes from Adelaide since 2011; with exports enabled by direct RPT connections to new markets in China and the Middle East. These new markets have led to sharp increases in export volumes and offset declines in established air freight markets, most notably in Singapore.

98 AECOM, GlobeLink Supply Chain Study, 2019
99 Data provided by Adelaide Airport
100 Adelaide Airport Master Plan 2019
Planes, not runways, are needed

Adelaide’s air freight suffers from a circuitous challenge, where low connectivity sees low volumes; which in turn sees low investment and low air freight productivity. This results in high value South Australian exports either departing via Melbourne or Sydney; or South Australia losing export revenue opportunities. Adelaide’s existing international airport faces few regulatory or operational constraints, particularly for freight. While there is an operational curfew between 11pm and 6am, there does not appear to be significant demand for services during these times anyway. Adelaide Airport continues to endeavour to attract new services, yet is unlikely to become capacity constrained on the airside in any reasonable evaluation period; and continues to reserve land area and allow for suitable land use planning toward a parallel third runway, if needed.

With relatively low air freight volumes and no capacity constraints, South Australia’s high value air freight export potential is likely to be realised through attracting new services, from new markets. Dedicated freight airports are generally considered to require volumes of between 500,000 and 1 million tonnes per annum to be commercially viable. AECOM’s demand forecasts, reflected in Figure 60, show that even on a high growth scenario, South Australia is unlikely to grow aviation exports to levels required to sustain a dedicated freight only international airport, within the foreseeable future.

Figure 59: International air freight from Adelaide

Source: BITRE, 2019

Figure 60: Forecast air freight growth scenarios

Source: AECOM Demand Forecasts
To reach a 500,000 tonne threshold by 2050, volumes at Adelaide Airport would need to grow 2.3 per cent more than the highest growth scenario.

With no foreseeable constraint on capacity at Adelaide Airport and the majority of airfreight being carried on RPT flights in the hold of wide-body passenger jets, the growth of freight movements from Adelaide Airport will largely be determined by the routes and frequency of passenger aircraft services.

Since new direct flights to Auckland and Doha were introduced, agricultural air freight export volumes through Adelaide Airport increased by 50 per cent, in only two years. Attracting new direct international passenger connections will introduce new direct freight capacity, lifting volumes and potentially addressing the limited signals for private investment in higher value export supply chains.

**Port of Adelaide: Can SA sustain the recent spike in ship calls?**

Historically, South Australia’s sea trade has been impacted by low numbers of ship calls, provided by smaller ships, seeing higher bluewater costs and less direct trade. This has changed, with the six years to 2018 seeing a 50 per cent increase in ship calls to the Port of Adelaide. South Australia’s share of national ship calls from 7.3 per cent to 10.7 per cent, over the same period.

![Figure 61: Container ship visits by port: January - June 2018](image)

Combined with the $80 million Outer Harbor Channel Widening Program to accommodate ‘Post Panamax’ sized vessels in the approach channels, swing basin and berth pockets, South Australia has substantial quayside and vessel capacity. This is supported by the Port’s operating hours, which are restricted to business hours on weekdays – the only major mainland port not operating on a 24/7 basis. At the current and unconstrained potential volume of ship calls, Port of Adelaide could not support similar extended hour operations, or multiple stevedores.
Ship calls and bluewater costs are only one factor driving port choice, noting that landside costs of getting cargo to/from the port gate is a much higher proportion of overall transport costs. The GlobeLink supply chain survey and field work saw a range of stakeholders identify challenges to rail playing a greater role, without substantial investment to reorient the existing rail head at Outer Harbor; which runs which runs perpendicular to the wharf / hardstand and necessitates transfers to trucks for movement to the wharf.

Land-side improvements to support rail access to the Port of Adelaide may support additional cost reductions for sea freight.

### Key Findings
- A lack of suitable direct international passenger and dedicated domestic air-freighter flights sees Adelaide Airport losing freight share to interstate airports – and is constraining private investment and high value international exports.
- There is no case for a dedicated freight airport in the near term, due to a lack of demand.
- The Port of Adelaide has seen a 50 per cent increase in ship calls in recent years, with an increase in relative share of ship calls compared to other capital city ports.
- Existing and new initiatives may support continuation of the trend to increase ship calls and accommodate larger ships.

### Considerations for Part C (Strategic Options)
- Can the SA Government complement efforts by Adelaide Airport Limited to encourage new international air connections, driving high value air freight exports in concert with wider investment attraction policies?

### What are the benefits?
Addressing the connectivity to global markets challenges identified will support the following benefits:

1. Improves competitiveness
2. Improved access
3. Improved confidence
4. Supports employment
5. Increases GVA
6. Reduces consumer costs
7. Better amenity & safety
4.5. Co-location and clustering of supply chains

**HYPOTHESIS:**

Co-locating and clustering of industries and supply chains will create an opportunity to grow South Australia’s emerging industries

The co-location and clustering of similar companies and industries, with related supply chains provides logical benefits, gathered around connectivity of skills, resources and supporting industries – allowing specialisation and volume to drive competitive advantages. In this way, government policies which support efficient co-location can be used to stimulate innovation, investment, production and growth – and drive productivity in supply chains in particular regions.

Examples of typical approaches include:

- **Centres-of-excellence:** Centres-of-excellence see businesses, researchers, government agencies and investors co-located and focused on a particular specialisation or product. Victoria’s Parkville medical precinct is one Australian example of this type of approach.

- **Freight villages:** A freight village is effectively an optimised intermodal facility where cargoes from different transport modes can be reloaded, aggregated and prepared for onward transport. Freight villages typically link road, rail and sea transport, alongside an ecosystem of related government and industry stakeholders; arrayed to drive the best possible transport service and value for shippers. Examples of successful freight villages include Interporto Bologna, CVZ Bremen, Padova CityPorto, and Broadmead Urban Consolidation Centre.

- **Collaborative distribution:** A recent trend has seen companies choosing to share distribution centres and warehousing to reduce supply chain costs, particularly where they have mutual customers or serve common locations. A range of stakeholders identified an interest in common facilities during supply chain interviews.

**Case study: The Sunshine National Employment and Innovation Cluster**

The Victorian Government’s innovation cluster in Sunshine is seeking to become a major employment hub for Melbourne’s west. Connected to the CBD, Melbourne’s airport and port precinct via major road and rail networks, the cluster is designed to connect businesses in the high population western suburbs to support local employment and economic outcomes. Already, there are 14,600 people employed in the precinct.

The Victorian Planning Authority is leading a programme involving local councils, state government agencies and industry to drive enabling land use changes, development and infrastructure investment, including ongoing integration of the cluster with key transport modes.

**Source:** Infrastructure South Australia 20 Year Infrastructure Discussion Paper, July 2019

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111 https://www.interporto.it/


113 See: http://www.interportoitalia.it/

114 See: http://www.bestufs.net/downloads/Workshops/BESTUFS_IL/London_Jan08/BESTUFS_London_Jan08_Davis_BristolCityCouncil.pdf

115 AECOM, GlobeLink Supply Chain Study, 2019

116 AECOM, GlobeLink Supply Chain Study, 2019
Can transport investments support clustering and co-location?

Adelaide’s transport planning has always followed key industries and populations, and is one of the reasons why the contemporary transport network is heavily oriented toward Adelaide’s industrial north; and why the North-South Corridor is the immediate transport priority within Adelaide.

Figure 51 in section 4.2 (above) shows the heavy concentration of industry already located along completed sections of the North-South Corridor, or in established industrial zones to the north of the CBD.

In contrast, contemporary design of the South Australian transport network sees products from the state’s south-east – and interstate freight between Adelaide and Victoria – lacking effective and safe freight links through Greater Adelaide and productive regions – and sees only one recent intermodal facility operating between the Adelaide Hills and the Victorian border (on the Victorian-side, there are nine metropolitan intermodal facilities (two more in planning stages), and another three regional intermodals serving Victoria’s western regions).

An intermodal export park to the south-east of Adelaide provides the opportunity to reduce supply chain costs in the south-east; particularly if considered in combination with other GlobeLink options.

The planning for an IMEX focused intermodal ‘inland port’ at Monarto by a private proponent also suggests there may be a feasible case for some form of intermodal export park, or freight village, in the south-east.

The proposed intermodal hub would permit the transfer of containers between road and rail at a site adjacent to Viterra’s existing silos at Monarto South.

Case study: Victoria’s Wimmera Intermodal Freight Terminal Industrial Precinct development

Victoria’s Wimmera Intermodal Freight Terminal – approximately 320 km north-west of the Port of Melbourne – is a key export hub for local grain producers – with the surrounding area’s economy comparable to the south-east of South Australia.

Opened in 2012, the intermodal facility delivered:

- increased container volumes being transported by rail from the Wimmera region from 8,916 TEUs in 2012-13 to an expected 23,567 TEUs in 2016-17; and
- a corresponding reduction in truck trips that would otherwise have been required to transport containers to the Port of Melbourne.

More recently, funding was committed for development of an industrial precinct, which will see the establishment of industrial lots with bitumen road access, street lighting and other amenities for agribusinesses and food and fibre processors establishing operations at the precinct.

Wimmera grain growers will benefit from the development of new industrial lots, improving supply chain efficiency, reducing cost and improving the competitiveness of Victorian farmers.


118 Truganina, west Melbourne referred to as the Western Interstate Freight Terminal; and Beveridge, north Melbourne referred to as the Beveridge Intermodal Freight Terminal.
Key Findings

• Concentration of infrastructure, including intermodal facilities, in the north and north-west of Adelaide sees limited intermodal facilities available to service the regions in the south-east, with only one intermodal, located at Bordertown.

• Comparatively, intermodal facilities on the western side of the Victorian border such as the Wimmera Intermodal Freight Terminal, have successfully supported agribusiness.

Considerations for Part C – Strategic options

• Assess the potential for a new intermodal terminal adjacent to the national rail freight network at Monarto or Tailem Bend and the impact on such a freight terminal where there is development of common use facilities.

• An optimised intermodal export park to the south-east of Adelaide may be feasible and offer opportunities to support regional employment and state competitiveness.

What are the benefits?

Addressing the co-location and clustering of supply chain opportunities identified will support the following benefits:

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<td>Improves competitiveness</td>
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<td>Reduces consumer costs</td>
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<td>Better amenity &amp; safety</td>
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4.6. Safety and amenity impacts

**HYPOTHESIS:**

South Australia’s primary road and rail freight routes traverse through the Adelaide Hills, arterial and suburban areas of metropolitan Adelaide, increasing safety risks and adversely impacting the liveability of local residential areas.

Freight demand between Adelaide and the Victorian border traverses the Adelaide Hills, with significant noise, safety and other effects on general traffic, local residents and overall community amenity. In Greater Adelaide, the co-mingling of heavy freight with suburban traffic and the general community sees negative impacts on people, local communities - and on state-wide productivity.

**Commingling freight and people on suburban roads sees poor safety outcomes and high costs**

Adelaide is unique among Australia’s major capitals by virtue of around half of its key urban freight routes operating along ordinary suburban roads, including Cross Road, Portrush Road and Grand Junction Road – shown in Figure 63 below.

*Figure 63: Key road and rail freight routes - metropolitan Adelaide*

Source: National Key Freight Routes, DIRD
An average weekday along these routes sees competition between trucks and commuter traffic rise on sections of these key arterial roads, with trucks comprising 9, 7 and 3.5 per cent of the total traffic along sections of Grand Junction, Portrush and Cross Road, respectively. Within a congested road network, both freight and passenger vehicles naturally seek a path of least resistance through ‘rat runs’ and back roads, meaning a substantial degree of freight and general traffic also accesses Adelaide’s local roads, putting heavy vehicles alongside suburban homes, cyclists and pedestrians.

Statistical evidence indicates that:

- At 60 km/h on dry roads a car will stop in 73 meters, while an average truck takes 80 metres on dry roads and 90 meters on wet roads.
- Heavy vehicles have less visibility with four major blind spots at the front, sides and a rear. This obscured visibility for about 20 feet ahead of the truck; can extend out to three lanes along the length of the truck and 200 feet behind the truck.
- Some trucks have side blind spots of several meters, and may prevent vision of cyclists and pedestrians.
- Trucks over 7.5 metres usually need to occupy multiple lanes, to make their turn on suburban streets.
- The majority of incidents involving heavy vehicles involve a light vehicle, pedestrian, cyclist or motorcyclist (85 per cent), however only 20 per cent was at the fault of the heavy vehicle.
- Fatigued drivers of heavy vehicles cause 16 per cent of heavy vehicle incidents.
- In 2016, 35 and 41 per cent of B-Doubles and road trains exceeded their speed limits on national roads, respectively.

Source

121 AECOM, Transport Model, 2019
KPMG’s analysis of collisions on key arterial roads in Figure 64 shows heavy vehicles substantially overrepresented in collision statistics. For example, trucks make up 8 per cent of journeys on Portrush Road, but are involved in 12 per cent of collisions.\\footnote{123 DPTI Traffic Management Centre}

**Figure 64: Percentage of collisions involving trucks**

![Percentage of collisions involving trucks](image)

Source: DPTI

In addition, the data suggests that heavy vehicles make up 20 per cent of fatal accidents state-wide, but compose only 8 per cent of South Australia’s road use. This proportion falls back to 7 per cent of serious injury crashes; and 5 per cent of minor injuries crashes, suggesting that where heavy vehicles are involved in collisions with other road users, the consequences tend to be much more serious.

**Figure 65: Fatal and serious crashes involving heavy vehicles, South Australia, 2012-2016\\footnote{124 See: https://www.dpti.sa.gov.au/__data/assets/pdf_file/0017/247310/Heavy_Vehicle_Fact_Sheet.pdf}**

![Fatal and serious crashes involving heavy vehicles](image)

Source: DPTI

Within Greater Adelaide, 21 per cent of the crashes over the period 2013-2017 involved heavy vehicles\\footnote{125 KPMG analysis based on DPTI data}. However, this number is significantly higher when examining the key freight routes along Adelaide’s arterial roads, such as Portrush Road. Figure 65 shows that heavy vehicles are overrepresented at most levels of crash severity, with the percentage of crashes that involve a heavy vehicle much higher than the state averages.

All told, KPMG’s calculations find that the economic cost of heavy vehicle collisions in Greater Adelaide averaged some **$258 million per year** from 2013 to 2017; composing some 21 per cent of annual crash costs in the region.\\footnote{126 KPMG analysis based on DPTI data}
The steep, continuous grades of the South Eastern Freeway through the Adelaide Hills pose further safety risks

The challenges facing south-eastern road freight movements extend beyond Adelaide itself, with an average of 108 crashes each year on the South Eastern Freeway between Mount Barker and Portrush Road in the five years to 2017. Of these, 33 per cent involved heavy vehicles, with a truck involved in a crash every 10 days on average. Figure 66 below shows the location of collisions on the South Eastern Freeway in 2017, with incidents involving heavy vehicles marked in red.

This shows a majority of freight collisions occurring between Hahndorf in the east and the terminus of the freeway at Portrush Road.

KPMG’s analysis suggests that heavy vehicle accidents along the Adelaide Hills segment of the South Eastern Freeway pose economic costs of $4.2 million per annum.

Figure 66: Crashes along the South Eastern Freeway in 2017

A range of high profile and sometimes fatal incidents have seen public attention focus on the risks posed by the South Eastern Freeway - Portrush Road - Cross Road intersection at the base of the Hills. Alongside two safety ramps between Crafers and Adelaide, heavy vehicles are restricted to a maximum speed of 60km/h during the descent and since 2019, face additional safety requirements and enhanced penalties for unsafe freight operating practices through the Adelaide Hills segment of the Freeway.

Communities in the Adelaide Hills bear the costs and risks of rail freight

Growth across the 20th century has seen residential areas in the Adelaide Hills steadily encroach on the 19th century rail corridor; with some 50km of track between Adelaide and Nairne now passing through suburbs and towns housing more than 100,000 people.

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127 KPMG analysis based on DPTI data
129 South Australian Rail Freight A Bypass to Save the Heart of Adelaide, 2007, para 3.3
Historic planning decisions see an unhappy tension between local resident’s amenities on the one hand; and the realities of a live operating rail corridor on the other. A 2010 DPTI study saw two thirds of public submissions identify impacts, with noise most commonly cited, in 55 per cent of submissions. This was followed by pollution, light spill and bush fire risks, among others.\textsuperscript{130,131}

Rail noise is influenced by factors including speed, wheel/rail contact angle and the curvature of track.\textsuperscript{132} With its one in 45 grade descent and numerous tight reverse curves, in practice noise impacts can only be treated, not avoided; given the increased locomotive work, ‘wheel squeal’ and braking\textsuperscript{133} required for trains to negotiate this challenging corridor.

Complex topography and limited land availability along the rail alignment limits the ‘easy’ answers; with solutions likely to lie in a completely new railway corridor that avoids residential areas.

KPMG estimates that rail freight between Mount Barker and Dry Creek impose annual externality costs of $2.46 million.\textsuperscript{134}

Crash costs along the same stretch of rail corridor were $0.13 million in 2018.\textsuperscript{135}

### Key Findings

- Heavy vehicles are disproportionately represented in Adelaide’s accident statistics and see much higher fatality rates
- The Adelaide Hills segment of the South Eastern Freeway sees trucks involved in one third of collisions – one each 10 days
- The Adelaide Hills rail corridor imposes amenity costs on local communities through increased noise and pollution impacts and elevated fire risks

### Considerations for Part C – Strategic Options

- Identify options to provide safe motorway-grade connections for heavy vehicles to transit the Adelaide Hills and Greater Adelaide itself, providing greater separation from general traffic and the community
- Consider options to divert the rail freight network away from population centres

### What are the benefits

Addressing the safety and amenity challenges identified will support the following benefits:

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<td>1</td>
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<td>7</td>
<td>Better amenity &amp; safety</td>
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</table>

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\textsuperscript{130} Adelaide Rail Freight Movements Study, June 2010  
\textsuperscript{135} KPMG analysis based on AECOM demand forecasts (6 May 2019) and BTE, 1999
4.7. Operational resilience

**HYPOTHESIS:**

There are limited road and rail links connecting Adelaide to key interstate industries and gateways, leaving the network vulnerable to major incidents.

The road and rail connections reaching south-east from Greater Adelaide to the Victorian border are among South Australia’s most important economic arteries; but with a single road and single rail corridor underpinning much of South Australia’s economy, it is appropriate to test the land transport networks’ resilience and the likely costs posed by major incidents.

**There are relatively few alternatives to the South Eastern Freeway for road freight**

Partial closure of the South Eastern Freeway occurred on average five times each week in 2018, with full closure of the freeway once to twice per year. This can have a large impact on road freight operations, as the freeway represents the primary freight route for B-Doubles, and is significantly shorter than any alternative routes.

By comparison, B-Doubles accessing Melbourne have a number of options for travel should there be any incidents on the primary freight. Figure 67 shows the possible B-Double freight routes entering metropolitan Adelaide, with Figure 68 showing the same for Melbourne, based on a 26m B-Double.

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Figure 67: Adelaide B-Double approved road routes with restrictions

![Adelaide B-Double approved road routes with restrictions](source-image1)

Source: RAV Net, DPTI; VIC Roads Open Data

Figure 68: Melbourne B-Double approved road routes with restrictions

![Melbourne B-Double approved road routes with restrictions](source-image2)

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136 Consultations with DPTI Traffic Management Centre, April 2019
Major incidents on the South Eastern Freeway can force large diversions, shown in Figure 69. A full closure of the South Eastern Freeway sees a 127kms one-way diversion across the back of the Adelaide Hills and connecting north at the Sturt Highway, posing additional $164 in vehicle operating cost and $66 in time, resulting in a total increased operating cost for each freight vehicle of approximately **$230 per trip**.\(^\text{137}\)

Figure 69: South Eastern Freeway Emergency Detour Plan (Northern Route)

![South Eastern Freeway Emergency Detour Plan](image)

Source: DPTI, National Key Freight Routes - DIRD

Even minor incidents can have a challenging effect on the network – for example, any closure of the freeway at Murray Bridge at the Swanport exit requires B-Doubles and other large freight vehicles to detour 256kms via Blanchetown, as shown in Figure 70.

\(^{137}\) KPMG analysis based on DPTI data
While rare, line closures on the Melbourne to Adelaide rail corridor can have considerable time and cost impacts

Disruptions on the Melbourne to Adelaide rail corridor do not happen very often – however, when they do occur – due to a derailment, bushfire or other major incident – rail operators have the choice of waiting for the line to reopen; detour the rail trip via Parkes in NSW; or transfer freight onto trucks, which can incur a costly premium for the heavy, vast volumes of freight typically carried by trains.

A rail detour via Parkes, adds an additional 15 hours of travel time, making the standard 13 hour journey a 28 hour trip. Excluding rail access charges, this deviation incurs an additional $42,115 in cost per one-way trip. As there are currently 46 scheduled trains between Dimboola and Keswick per week, this equates to – approximately $0.28 million per day.

The Supply Chain Study found that significant line closures such as these occur about once a year – which means that it is a real threat to the resilience of the rail corridor.
Key Findings

- B-Double access to Adelaide is heavily dependent on the South Eastern Freeway, with alternate routes such as via Truro adding significant time and distance travelled.
- Rail derailments, although only occurring about once per-year, result in timely and costly delays.

Considerations for Part C – Strategic options

- Improvements to the resilience of the road and rail freight corridors can reduce the frequency of incidents requiring significant time delays or detours.

What are the benefits

Addressing the operational resilience challenges identified will support the following benefits:

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5. Aligning freight policies to freight problems

5.1. Alignment with government priorities

Addressing the problems and opportunities support the achievement of State and Commonwealth plans, policies and priorities. Figure 71 identifies some of the common themes of current strategic and tactical freight policies, which are directly relevant to the GlobeLink objectives. The problems and opportunity hypothesis statements are directly relevant to these policy themes. Figure 71 also links the policy themes to the problem and opportunity hypothesis statements.

**Figure 71 GlobeLink alignment to policies and priorities**

<table>
<thead>
<tr>
<th>Problems &amp; opportunities</th>
<th>Policy Theme</th>
<th>Relevant Strategies, Policies and Plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road and rail network efficiency</td>
<td>Improve freight efficiency, such as firstlast mile freight movements, removal of freight operating restrictions (i.e., HPVs, airport curfews) &amp; intermodal connectivity</td>
<td>Greater Adelaide 30 Year Plan Australian Infrastructure Plan National Freight and Supply Chain Strategy Australian Infrastructure Audit</td>
</tr>
<tr>
<td>Connectivity to global markets</td>
<td>Greater flexibility is required to keep pace with economic growth and accommodate access to global markets</td>
<td>State Planning Policies (SA) National Freight and Supply Chain Strategy</td>
</tr>
<tr>
<td>Safety and Amenity</td>
<td>Minimise negative impacts on communities and environments</td>
<td>National Freight and Supply Chain Strategy National Land Freight Strategy</td>
</tr>
<tr>
<td>Operational resilience</td>
<td>Maximise use of existing and planned transport infrastructure</td>
<td>State Planning Policies (SA) Australian Infrastructure Plan Australian Infrastructure Audit Integrated Transport and Land Use Plan (SA)</td>
</tr>
</tbody>
</table>
5.2. The impact of existing or planned infrastructure

GlobeLink has important inter-dependencies with major projects currently underway or in planning by the Commonwealth, SA Government or the private sector. Table 14 shows a selection of some of the current and planned projects within the GlobeLink study area, and their potential impact on the problems and opportunities.

Table 14: Related projects

<table>
<thead>
<tr>
<th>Project</th>
<th>Description</th>
<th>Impact</th>
<th>Stage</th>
<th>Timing</th>
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<tbody>
<tr>
<td>Adelaide’s North–South Corridor</td>
<td>Various upgrades in stages to the key freight and commuter route between Gawler and Old Noarlunga, in response to expectations that will the corridor will not be able to handle future traffic projections.</td>
<td>The upgraded corridor will improve connectivity of freight to and from Adelaide Airport and the Port of Adelaide, as well as regional areas, increasing freight frequency, in particular at the Grand Junction - South Rd intersection.</td>
<td>Partially delivered (partially unfunded)</td>
<td>In stages over the next 10 years</td>
</tr>
<tr>
<td>Inland Rail</td>
<td>Development of a freight rail line between Brisbane and Melbourne, via an inland route. The project aims to connect regional Australia to market more efficiently, driving reduced costs for industry and the delivery of significant economic benefits.</td>
<td>The project seeks to improve freight connectivity between cities and regions on the east coast. By improving SA’s freight connectivity to the interstate freight network, there is an opportunity for SA to capitalise on the benefits delivered by Inland Rail.</td>
<td>Procurement stage</td>
<td>5 – 10 years</td>
</tr>
<tr>
<td>Regional road network safety improvements</td>
<td>Nationally targeted infrastructure improvements, such as alignment corrections and modern road safety technology to improve road safety outcomes.</td>
<td>This initiative will support the improvement regional roads, including those used for freight, improving the resilience, safety and efficiency of the network. This initiative is only focussed on regional roads, with freight routes connecting into or through Adelaide not considered.</td>
<td>Procurement stage</td>
<td>&lt;5 years</td>
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<tr>
<td>Project</td>
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<td>Network Optimisation Program – Rail &amp; Road</td>
<td>Program of works nationally to help maximise the existing productive capacity of the road and rail network. These programs are targeted at addressing the growing issue of urban congestion across multiple corridors in Australian cities.</td>
<td>This program shares the objective of maximising use of existing infrastructure. Implementation of this program could reduce GlobeLink problems by improving liveability, as well as the efficiency of freight movements within Adelaide.</td>
<td>Procurement stage</td>
<td>&lt; 5 years</td>
</tr>
<tr>
<td>CBD tram extensions</td>
<td>Expansion of the tram network in Adelaide, improving access to the CBD and inner suburbs. The initiative aims to reduce road congestion and delays which impact economic efficiency.</td>
<td>Implementation of this initiative would reduce delays and urban congestion, thereby addressing the GlobeLink problems of efficiency and flexibility by reducing passenger competition and improving traffic flow and travel time reliability.</td>
<td>Planning study</td>
<td>5 – 10 years</td>
</tr>
<tr>
<td>Gawler Craton rail access</td>
<td>Third party builds, owns and operates railway in the Gawler Craton province, linking to the existing interstate rail network.</td>
<td>Private linkages to the existing rail network are likely to place additional strain on key gateways and access to services at Adelaide’s air and sea ports.</td>
<td>Planning (pre-business case)</td>
<td>10 – 15 years</td>
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<td>Urban congestion fund upgrade</td>
<td>Funding to support the urban road network across Australia through the reduction of travel times, reduction of vehicle operating costs, improving the reliability of the road network for commuters &amp; freight and addressing bottlenecks.</td>
<td>The objectives of this Program are closely aligned to those of the GlobeLink study process. The overlap in benefits delivered may diminish the positive impact delivered by addressing the identified Problems and Opportunities.</td>
<td>Ongoing delivery</td>
<td>Over the next 10 years</td>
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</table>
A note on related projects

The above projects are identified as being highly correlated with the problem and opportunity statements; whereby if the problem and opportunity statements were addressed, there may be opportunity to realise further returns and benefits from these, already committed, initiatives.

Although the impact of these projects on GlobeLink has been assessed qualitatively; these impacts have not been incorporated into the technical and economic analysis (i.e. macroeconomic forecasts, transport modelling and demand modelling) due to the lack of certainty surrounding many of the projects, and the difficulty in quantifying their impacts.
PART C: Addressing SA’s freight problems

This section identifies, distills and investigates potential capital and non-capital solutions in response to the problem and opportunity statements established in Part B – and, ultimately, provides the basis to inform investment decisions which will achieve the GlobeLink objectives.

To align with national and SA Government infrastructure assessment processes, our approach has been to establish a longlist of available strategic options; to refine the list of options – working alongside SA Government representatives and industry stakeholders, through a series of workshops, reference group meetings, reviews and assessments – to evaluate the options against a robust criteria framework, and refine a shortlist of options for further investigation.

These criteria for evaluation have been tested and endorsed by a wide selection of freight industry stakeholders.

The GlobeLink shortlist options provide a basis for further investigation, including more detailed design, cost estimation and economic appraisal – and provide measurable proof to make informed, evidence-based decisions, against the GlobeLink objectives.
6. Strategic options: Addressing SA’s freight problems

6.1. Introduction

This section of the GlobeLink Scoping Study identifies and develops the longest possible list of ‘strategic options’, to address problems identified in Part B – subjecting them to a range of assessment techniques to refine toward the options offering the best potential benefits. Strategic options considered in this study are segmented into two broad categories, being:

1) **Capital options**: High-level potential infrastructure projects, like a new or expanded road, railway or port; and

2) **Non-capital options**: Operational changes (like new technologies) or regulatory changes such as operating hours, which could address problems through extracting higher services or lower costs, from existing infrastructure.

Individual options are considered in isolation; and where appropriate, in combination.

6.2. Developing the widest pool of possible options

Developed in consultation with industry and key stakeholders, our initial list identified 60 possible headline options – 23 non-capital and 37 project options – seeing more than 100 possible strategic responses, once sub-options and combinations are counted.

KPMG applied a transparent, four stage assessment process to filter options through a series of qualitative and quantitative reviews, reflecting national and SA Government infrastructure appraisal methods and outlined in Figure 72 below.

Graduation from each sequential stage sees options subjected to increasing levels of technical and economic analysis, allowing effort and resources to be applied to the strategic options offering the highest potential net benefit and strategic alignment to GlobeLink’s objectives.

**Figure 72 Four stage review and shortlisting process**
6.3. Identifying an initial list of options through consultation

The table below outlines the range of options considered. The list of options identified is extensive – and includes reform, better-use, infrastructure improvement and new infrastructure solutions. Further detail regarding the options identified are provided in Appendix 1.

Table 15: Strategic options identified through consultation

<table>
<thead>
<tr>
<th>Non-capital strategic options</th>
<th>Capital strategic options</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>9 Reform</strong></td>
<td><strong>14 Better use</strong></td>
</tr>
<tr>
<td>Formalisation of road / rail curfews</td>
<td>Heavy vehicle road pricing</td>
</tr>
<tr>
<td>Modernise transport regulation</td>
<td>Road network operational reforms</td>
</tr>
<tr>
<td>Increase the reach of HPVs</td>
<td>Increasing public transport use</td>
</tr>
<tr>
<td>Alignment with import requirements</td>
<td>De-centralisation / TODs</td>
</tr>
<tr>
<td>ADL flexibility initiatives</td>
<td>Increase freight rail use</td>
</tr>
<tr>
<td>Protect future lands and corridors</td>
<td>R&amp;D in rail technology</td>
</tr>
<tr>
<td>Integrated urban planning</td>
<td>Stevedore competition</td>
</tr>
<tr>
<td>Council amalgamations</td>
<td>International liner subsidisation</td>
</tr>
<tr>
<td>Flexibility of customs locations</td>
<td>Inland ports</td>
</tr>
<tr>
<td>More flights, more freight</td>
<td>ADL access road upgrades</td>
</tr>
<tr>
<td>Freight consolidation centres</td>
<td>Seal Strezeleki Track</td>
</tr>
<tr>
<td>Port Community System (PCS)</td>
<td>Crystal Brook to Broken Hill rail upgrades</td>
</tr>
<tr>
<td>Freight Strategies</td>
<td>Belair line standard gauge curve easing</td>
</tr>
<tr>
<td>Grain container standardisation</td>
<td>Tottenham to Keswick passing loop extensions</td>
</tr>
<tr>
<td></td>
<td>Tottenham to Keswick double stacking upgrades</td>
</tr>
<tr>
<td></td>
<td>Regional rail freight and grain site investment</td>
</tr>
<tr>
<td></td>
<td>Eyre Peninsula rail network standardisation</td>
</tr>
<tr>
<td></td>
<td>Mount Gambier to Heywood line gauge standardisation</td>
</tr>
<tr>
<td></td>
<td>New bogies on rail line to reduce wheel squeal</td>
</tr>
<tr>
<td></td>
<td>Outer Harbour channel and berth upgrades</td>
</tr>
<tr>
<td></td>
<td>ADL East</td>
</tr>
<tr>
<td></td>
<td>Compulsory acquisition of flight paths</td>
</tr>
</tbody>
</table>
## 6.4. Review stage 1: Defining & refining a longlist of options

The initial list of 60 possible options was subjected to a qualitative process to assess options based on their strategic alignment with GlobeLink’s objectives and practical assessment of strengths and weaknesses. This strategic fit and viability assessment reduced the initial 60 options, to a longlist of 20 strategic options, to advance to the next stage of assessment. These 20 options are described in Table 16 below.

### Table 16: Longlist strategic options

<table>
<thead>
<tr>
<th>Strategic option</th>
<th>Description</th>
<th>Strategic option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Non-capital strategic options</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Heavy vehicle road pricing</strong></td>
<td>Road pricing reforms to influence behaviours on major road freight routes, based on:</td>
<td><strong>Increase public transport use</strong></td>
<td>Encourage commuter mode shift to public transport, for example through:</td>
</tr>
<tr>
<td></td>
<td>• Time, distance, mass and location based charging used to improve efficiency and safety of road freight task</td>
<td></td>
<td>• Attractive fare pricing</td>
</tr>
<tr>
<td></td>
<td>• Applied to all heavy vehicles</td>
<td></td>
<td>• Improved mode integration</td>
</tr>
<tr>
<td></td>
<td>• Not applied to light vehicles</td>
<td></td>
<td>• Improved PT service quality</td>
</tr>
<tr>
<td><strong>Modernise transport regulation</strong></td>
<td>Relevant transport, safety and wider legislation and regulation reforms to provide for efficient testing and licensing of “breakthrough” technologies. Examples could include autonomous freight vehicles, freight drones and others.</td>
<td><strong>Increase freight rail use</strong></td>
<td>Incentives could improve the (very) low volumes of containerised and bulk freight movements, which currently and increasingly traverse the GlobeLink study area and Greater Adelaide on heavy freight vehicles. The higher costs of rail freight mean direct cash subsidies would likely be required.</td>
</tr>
<tr>
<td><strong>Road network operational reforms</strong></td>
<td>A broad suite of potential operational changes across the road network, which could include:</td>
<td><strong>ADL flexibility initiatives</strong></td>
<td>Identify and remove any operational constraints impacting air freight to/from South Australia, potentially including:</td>
</tr>
<tr>
<td></td>
<td>• Dynamic or optimised signal sequencing across the road network;</td>
<td></td>
<td>• Reduce or remove the airport curfew at ADL or consider performance-based approach</td>
</tr>
<tr>
<td></td>
<td>• Clearway extensions / introductions to increase capacity;</td>
<td></td>
<td>• Introduce flexible shoulder periods</td>
</tr>
<tr>
<td></td>
<td>• Create priority freight lanes to separate freight and other road users;</td>
<td></td>
<td>• Increase resourcing for IMEX border processes at ADL</td>
</tr>
<tr>
<td></td>
<td>• Vary road speeds to meet demand and conditions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategic option</td>
<td>Description</td>
<td>Strategic option</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------</td>
<td>-------------</td>
<td>-----------------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| Increase the reach of HPVs | Identify where current operating restrictions or prohibitions can be changed to increase reach of Higher Productivity Vehicles, including:  
- Enabling HPVs to enter Adelaide from the south-east  
- Increase the safe operation of HPVs across the wider network  
- Work with councils to encourage consistent HPV rules to address first/last mile issues | More flights, more freight | South Australia’s low level of direct international passenger flights sees correspondingly low levels of freight capacity, which is most often carried on regular passenger flights. Few flights sees limited capacity, connecting to few markets.  
This strategic option could include direct measures to increase the attractiveness and/or reduce financial risks to potential operators for a defined period.  
Aligns with SA Growth State. |
| Protect future lands and corridors | Identify and protect strategic lands and transport corridors from encroachment, for future use. Examples could include long-term road or rail corridors or lands for future intermodal or airport development. | | |

### Capital strategic options

<table>
<thead>
<tr>
<th>Strategic option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cross Road tunnel - M1 to North-South Corridor</strong></td>
<td>A new tunnel from the South Eastern Freeway to the North-South Corridor, following a ‘Cross Road’ alignment. Designed to address safety and cost impacts of descent from the Hills into Adelaide.</td>
</tr>
<tr>
<td><strong>Cross Road &amp; South Eastern Freeway upgrades</strong></td>
<td>'At-grade' upgrade of Cross Rd from the South Eastern Freeway to the North-South Corridor. Intersection upgrades, grade separations and road widening, with safety upgrades to the South Eastern Freeway.</td>
</tr>
<tr>
<td><strong>GlobeLink Reference Road</strong></td>
<td>Eastern road bypass of the Adelaide Hills, from Murray Bridge via Truro. Mix of road upgrades and new greenfield segments.</td>
</tr>
<tr>
<td><strong>Alternate M1 route – ‘Short South’</strong></td>
<td>New road corridor (including tunnels) between Mount Barker and the North-South Corridor at Darlington.</td>
</tr>
<tr>
<td><strong>GlobeLink Reference Airport</strong></td>
<td>Increase landside freight and passenger connectivity between ADL and the North-South Corridor, including Richmond Road.</td>
</tr>
<tr>
<td><strong>GlobeLink Reference Rail</strong></td>
<td>New, dedicated freight airport located near Murray Bridge.</td>
</tr>
<tr>
<td><strong>Belair line standard gauge curve easing</strong></td>
<td>Curve easing of standard gauge line across the Adelaide Hills to reduce noise and increase speeds.</td>
</tr>
</tbody>
</table>
### Strategic option

<table>
<thead>
<tr>
<th>Description</th>
<th>Strategic option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>New road corridor (including tunnels) between Mount Barker and Grand Junction Road via Hope Valley.</td>
<td>Alternate M1 route – ‘Short North’</td>
<td>Re-open decommissioned regional rail lines and invest to enable higher axle loads and operating speeds. Investment in grain collection sites.</td>
</tr>
<tr>
<td>New intermodal terminal and export park at Murray Bridge. This may include: • Empty container park • Common user cold storage • On-dock rail at Outer Harbor • Facilities to support a freight village</td>
<td>Regional rail freight and grain site investment</td>
<td></td>
</tr>
<tr>
<td>New intermodal terminal and export park at Murray Bridge. This may include: • Empty container park • Common user cold storage • On-dock rail at Outer Harbor • Facilities to support a freight village</td>
<td>GlobeLink Reference Intermodal Export Park</td>
<td></td>
</tr>
</tbody>
</table>

---

### 6.5. Review stage 2: Using an MCA to develop a shortlist of options

The second stage of assessment saw the longlist of options prioritised using a Multi Criteria Analysis (MCA), based on the GlobeLink project objectives and outlined in Figure 73 below.

**Figure 73: GlobeLink’s MCA criteria, based on project objectives**

1. Supports state and national productivity and competitiveness through improved freight system efficiency, connectivity and capacity

2. Increases and attracts new employment and investment within the region and for SA

3. Improves safety and amenity and achieves social benefits that are considerate of community views

4. Facilitates industry collaboration, partnership and innovation

5. Optimises the use of existing SA infrastructure

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Document Classification: KPMG Public
Each potential strategic option was scored across each of these five criteria, using a qualitative scale ranging from -3 (strongly negative) to +3 (strongly positive).

Table 17: MCA scoring criteria

<table>
<thead>
<tr>
<th>Score</th>
<th>Definition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Strongly Positive</td>
<td>Major positive impacts on outcomes for this criterion</td>
</tr>
<tr>
<td>2</td>
<td>Moderately Positive</td>
<td>Moderately positive impact on outcomes for this criterion</td>
</tr>
<tr>
<td>1</td>
<td>Slightly Positive</td>
<td>Minimal positive impact on outcomes for this criterion</td>
</tr>
<tr>
<td>0</td>
<td>Neutral</td>
<td>No discernable impact for this criterion</td>
</tr>
<tr>
<td>1</td>
<td>Slightly Negative</td>
<td>Minimal negative impact on outcomes for this criterion</td>
</tr>
<tr>
<td>2</td>
<td>Moderately Negative</td>
<td>Moderate negative impact on outcomes for this criterion</td>
</tr>
<tr>
<td>3</td>
<td>Strongly Negative</td>
<td>Major negative impact on outcomes for this criterion</td>
</tr>
</tbody>
</table>

To ensure additional rigour and transparency, the MCA was undertaken through a dedicated half day workshop, which included relevant government officials nominated by each SA Government agency on the steering committee; alongside key project personnel from DPTI, KPMG and AECOM.

The in-depth process ultimately saw a consensus position on the MCA scores, which are outlined in Table 18, below.

Based on the MCA, three strategic options were selected to advance to the final stage of assessment, including initial design, cost estimation, detailed transport modelling and economic appraisal – including calculation of a Rapid Benefit Cost Ratio (BCR).

With five roads scoring well, the steering committee endorsed an initial, high level and simple quantitative assessment to allow the number of road options to be reduced from five, to three.

Two options involving Adelaide Airport demand incentivisation and supporting connecting road infrastructure were considered to be highly similar and therefore packaged into a single option for further investigation.

Another five strategic options were not progressed, despite in some cases performing well against the MCA, considered complementary initiatives, and are recommended for ongoing investigation outside of the GlobeLink process.
### Table 18: MCA results

<table>
<thead>
<tr>
<th>Strategic option</th>
<th>State &amp; National Productivity</th>
<th>Employment &amp; Investment</th>
<th>Safety, Amenity &amp; Social Benefits</th>
<th>Collaboration &amp; Innovation</th>
<th>Optimize Existing Infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td>GlobeLink Reference Intermodal Export Park</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>GlobeLink Reference Rail</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>International air freight growth initiatives</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- More flights, More freight</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>- ADL access road upgrades</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

### STRATEGIC OPTIONS PROGRESSING TO FULL ASSESSMENT

<table>
<thead>
<tr>
<th>Strategic option</th>
<th>State &amp; National Productivity</th>
<th>Employment &amp; Investment</th>
<th>Safety, Amenity &amp; Social Benefits</th>
<th>Collaboration &amp; Innovation</th>
<th>Optimize Existing Infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td>GlobeLink Reference Intermodal Export Park</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>GlobeLink Reference Rail</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>International air freight growth initiatives</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- More flights, More freight</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>- ADL access road upgrades</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

### ROAD OPTIONS SUBJECT TO ADDITIONAL QUANTITATIVE ASSESSMENT

<table>
<thead>
<tr>
<th>Strategic option</th>
<th>State &amp; National Productivity</th>
<th>Employment &amp; Investment</th>
<th>Safety, Amenity &amp; Social Benefits</th>
<th>Collaboration &amp; Innovation</th>
<th>Optimize Existing Infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td>GlobeLink Reference Road</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Cross Road tunnel - M1 to North-South Corridor</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Cross Road &amp; South Eastern Freeway upgrades</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Alternate M1 route – ‘Short North’</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Alternate M1 route – ‘Short South’</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### COMPLIMENTARY INITIATIVES PROGRESSED ELSEWHERE

<table>
<thead>
<tr>
<th>Strategic option</th>
<th>State &amp; National Productivity</th>
<th>Employment &amp; Investment</th>
<th>Safety, Amenity &amp; Social Benefits</th>
<th>Collaboration &amp; Innovation</th>
<th>Optimize Existing Infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modernise transport regulation</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Heavy vehicle road pricing</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Increase the reach of HPVs</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Road network operational reforms</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Increase public transport use</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>
**Strategic Options Not Progressed**

<table>
<thead>
<tr>
<th>Strategic option</th>
<th>State &amp; National Productivity</th>
<th>Employment &amp; Investment</th>
<th>Safety, Amenity &amp; Social Benefits</th>
<th>Collaboration &amp; Innovation</th>
<th>Optimise Existing Infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td>GlobeLink Reference Airport</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Belair line standard gauge curve easing</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Regional rail freight and grain site investment</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Increase freight rail use</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Protect future lands and corridors</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>ADL flexibility initiatives</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Detailed assessment findings for each criterion across each of the strategic options, is captured in Appendix B.

**Plane speaking: More connections from existing runways:**

GlobeLink’s initiating policy committed to explore whether developing a dedicated freight airport to Adelaide’s south-east could provide new connections between high quality South Australian products and high paying global and regional consumers.

Our analysis suggests that at circa 59,300 tonnes per annum, South Australia’s air freight volumes lack the scale to require a dedicated airport; or the demand to attract regular, dedicated air freighters to use it. Further, with significant unused airside capacity at Adelaide’s existing airport, the GlobeLink Reference Airport option scored poorly on the MCA.

But that does not mean that the focus on airfreight was wrong – just that the mechanism may be different – and much lower cost than a new airport.

Globally, most air freight is carried in the belly of regular passenger aircraft; South Australia’s air freight has doubled in recent years, as new direct international connections have been added. This has also diversified the State’s air freight trading partners.

While the GlobeLink Reference Airport scored poorly on the MCA – an alternative air freight option scored well; advancing for further consideration and detailed analysis.

The ‘More Flights, More Freight’ strategic option is non-capital; focused on generating air freight demand through new connections, via South Australia’s existing international airport – and complementing the wider SA Government Growth State.
6.6. **Review stage 3: Simple quantitative assessment to pick between road options**

MCA’s are a powerful qualitative tool, allowing multiple options to be assessed, across a range of criteria. But while powerful, MCAs can lack the simplicity and clarity of quantitative measures. With an initial shortlist of eight strategic options, but including five road options offering similar qualitative results, the steering group endorsed a ‘rapid-rapid’ quantitative assessment to further reduce the number of road options taken through to Stage 4, based on a high level assessment of net benefits and net present value.

The five road options are outlined below:

**Table 19: Capital investment in road options**

<table>
<thead>
<tr>
<th>Option &amp; Description</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alternate M1 route – ‘Short North’</strong></td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Map of Alternate M1 route – ‘Short North’" /></td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Cost $2.1bn Indicative capital 37km" /></td>
<td></td>
</tr>
<tr>
<td>New road corridor (including tunnels) between Mount Barker and Grand Junction Road via Hope Valley</td>
<td></td>
</tr>
<tr>
<td><strong>Cross Road &amp; South Eastern Freeway upgrades</strong></td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Map of Cross Road &amp; South Eastern Freeway upgrades" /></td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Cost $0.4bn Indicative capital 6.4km" /></td>
<td></td>
</tr>
<tr>
<td>‘At-grade’ upgrade of Cross Rd from the South Eastern Freeway to the North-South Corridor. Intersection upgrades, grade separations and road widening, with safety upgrades to the South Eastern Freeway.</td>
<td></td>
</tr>
<tr>
<td>Option &amp; Description</td>
<td>Location</td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Cross Road tunnel - M1 to North-South Corridor</td>
<td><img src="image" alt="Cross Road tunnel map" /></td>
</tr>
<tr>
<td>$18.2bn</td>
<td>16.6km</td>
</tr>
<tr>
<td>Indicative capital cost</td>
<td>Length</td>
</tr>
<tr>
<td>A new tunnel from the South Eastern Freeway to the North-South Corridor, following a 'Cross Road' alignment. Designed to address safety and cost impacts of descent from the Hills into Adelaide.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GlobeLink Reference Road</th>
<th><img src="image" alt="GlobeLink Reference Road map" /></th>
</tr>
</thead>
<tbody>
<tr>
<td>$2.6bn</td>
<td>97.5km</td>
</tr>
<tr>
<td>Indicative capital cost</td>
<td>Length</td>
</tr>
<tr>
<td>Eastern road bypass of the Adelaide Hills, from Murray Bridge via Truro. Mix of road upgrades and new greenfield segments.</td>
<td></td>
</tr>
</tbody>
</table>
### Alternate M1 route – ‘Short South’

New road corridor (including tunnels) between Mount Barker and the North-South Corridor at Darlington.

The efficiency gains of this route will increase as the North-South Corridor’s additional segments are progressively completed.

The North-South Corridor is currently gazetted for B-Doubles, but could see larger benefits if this was increased to higher productivity vehicles.

### 6.6.1. Methodology

To inform choices between the five road options, we designed a simplified CBA approach, allowing a high level analysis of simple benefits and major costs. This approach does not consider a range of important benefits and therefore does not indicate the economic viability or otherwise, of any project option. Rather, analysis provides a simple indication of the relative marginal economic benefits and costs posed by each option.

The ‘rapid-rapid’ CBA analysis was undertaken in accordance with the Australian Transport Assessment and Planning (ATAP) guidelines, based on the assumptions identified in Table 20, below.

**Table 20: ‘Rapid-rapid’ BCR assumptions**

<table>
<thead>
<tr>
<th>BENEFITS</th>
<th>COSTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Travel time savings</td>
<td>• Indicative capital costs;</td>
</tr>
<tr>
<td>• Vehicle operating cost savings</td>
<td>• Real discount rate of 7 per cent per annum</td>
</tr>
<tr>
<td>• Residual values at end of asset life</td>
<td>• 30-year evaluation period, commencing 2026</td>
</tr>
</tbody>
</table>

The analysis was also informed by outputs form the South Australian Strategic Travel Model (SASTM) - a state wide strategic transport model, developed by AECOM for GlobeLink.

SASTM was developed as part of GlobeLink, to extend DPTI’s existing Metropolitan Adelaide Strategic Transport Evaluation Model (MASTEM), to reach South Australia’s borders.
6.6.2. Findings

This assessment shows that two road options stand out for further investigation, reflecting their higher initial ‘rapid-rapid’ CBA results; and solid strategic fit.

These roads are ‘Short North’ and ‘Short South’ outlined in section 6.6 above.

A third option was also included – the Cross Road Tunnel. This option ranked fourth on our simplified BCR and NPV measures; but also recorded the highest benefit of any option assessed. This option has also formed an advocacy priority for the SA Freight Council in recent times and was deemed to warrant analysis, given its relevance to the GlobeLink Scoping Study.

The ‘Cross Road upgrade’ option performed well under this simplified BCR/NPV analysis, largely because of the substantially lower cost involved in ‘at-grade’ upgrades; but this simple assessment neglects wider GlobeLink objectives, with this option performing poorly on amenity and safety measures in the MCA.

*Note that a more detailed BCR assessment of all shortlisted options is undertaken in review stage 4, where greater consideration is provided to quantification of potential benefits – the ‘rapid-rapid’ BCR results being below 1 is therefore not necessarily a poor outcome – however aids the differentiation and prioritisation of the mutually exclusive road options.*

<table>
<thead>
<tr>
<th>Road Option</th>
<th>Rapid-rapid BCR</th>
<th>NPV</th>
<th>Observations</th>
<th>Shortlisted options</th>
</tr>
</thead>
</table>
| Alternate M1 route – ‘Short South’ | 0.44            | - $390 m | • Slightly longer than South Eastern Freeway, marginally increasing vehicle operating costs  
• Benefits increase as North-South Corridor completed | ✔️                   |
| Alternate M1 route – ‘Short North’ | 0.31            | - $784 m | • Most direct connection to Adelaide’s Port precinct  
• Connects to Adelaide’s key road corridors | ✔️                   |
| Cross Road Tunnel - M1 to North-South Corridor | 0.21            | - $18,000 m | • Has the highest benefits for VOC and VOT  
• Most of the returns driven by a high asset residual value | ✔️                   |
| Cross Road & South Eastern Freeway upgrades | 0.30            | - $220 m | • Highest NPV, driven by lowest cost  
• ‘At-grade’ upgrade solution sees amenity and safety impacts and costs and may limit HPVs  
• Low alignment with wider GlobeLink objectives |                   |
| GlobeLink Reference Road | 0.06            | - $1,971 m | • Longest distance erodes time and cost savings  
• Low BCR and NPV |                   |
7. Options investigation: Supporting GlobeLink’s outcomes

7.1. Introduction

This section of the GlobeLink scoping study sets out the shortlist of potential investment options identified in Chapter 6 and assesses the relative merits of each using a rapid Cost-Benefit Analysis (CBA).

Figure 74 provides a snapshot of the investment options, categorised broadly based on the key drivers they each achieve.

Figure 74: Snapshot of investment options

Options that improve connectivity to global markets and trading partners

1 | More planes, more freight

Options that improve freight efficiency and improve safety & amenity

2 | Alternate M1 route – ‘Short South’

3 | Alternate M1 route – ‘Short North’

4 | Cross Road tunnel - M1 to North-South Corridor

5 | GlobeLink Reference Rail

Options that support business innovation, growth and investment

6 | GlobeLink Reference Intermodal Export Park
7.2. **Review stage 4: Economic appraisal of the options**

Our steps in undertaking a rapid CBA on the GlobeLink options is outlined below. By its nature, a rapid economic assessment has a lower level of granularity and data compared to a full CBA and examines a lower range of direct benefits and excludes wider benefits.

Our rapid CBA methodology accords with relevant national and South Australian guidelines including Infrastructure Australia and ATAP guidelines for project appraisal. Table 22 below provides a detailed outline of our methodological approach and frameworks use in our appraisal.

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Author</th>
<th>Publication</th>
</tr>
</thead>
<tbody>
<tr>
<td>National</td>
<td>Infrastructure Australia</td>
<td>Infrastructure Australia Assessment Framework (March 2018)</td>
</tr>
<tr>
<td></td>
<td>ATAP</td>
<td>PV2: Road Parameter Values (August 2016)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T2: Cost-Benefit Analysis Guidelines (May 2018)</td>
</tr>
<tr>
<td></td>
<td>Austroads</td>
<td>Economic Evaluation of Road Investment Proposals: Unit values for road user costs (2004)</td>
</tr>
<tr>
<td></td>
<td>Civil Aviation Safety Authority</td>
<td>Standard Economic Values Guidelines (September 2009)</td>
</tr>
<tr>
<td>Other jurisdictions</td>
<td>Transport for New South Wales</td>
<td>Principles and Guidelines for Economic Appraisal of Transport Investment and Initiatives (June 2018)</td>
</tr>
<tr>
<td></td>
<td>United Kingdom Department for Transport</td>
<td>Transport Analysis Guidance (May 2018)</td>
</tr>
<tr>
<td></td>
<td>New Zealand Transport Agency (NZTA)</td>
<td>Economic Evaluation Manual (July 2018)</td>
</tr>
</tbody>
</table>
7.3. **GlobeLink base case**

Defining the ‘base case’ is a fundamental component of economic appraisal, allowing each potential option to be assessed based on the different benefits and costs they pose, versus the base case.

For the rail, intermodal and air options we have used a single BAU base case, which assumed no major capital, operational or regulatory changes over the evaluation period.

For the road options we have applied two base cases – the first assumes the Darlington to Torrens upgrade of the North South Corridor are completed, reflecting SA Government transport policies. We refer to this as the ‘DPTI’ base case.

Our second road base case assumes that the North South corridor is not complete, in accordance with IA’s guidelines which allow only funded or completed projects to be assumes. We call this the ‘IA base case’.

Table 23 outlines the base cases applied.

**Table 23: Road option base case scenarios**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Base Case</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Road</strong></td>
<td>All options assessed against two base cases:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● Base Case 1</td>
<td>● Southern Road Link (SRL)</td>
</tr>
<tr>
<td></td>
<td>● Base Case 2</td>
<td>● Cross Road Tunnel (CRT)</td>
</tr>
<tr>
<td></td>
<td>Base Case 1 assumes that the North-South Corridor is built by 2036. The</td>
<td>● Northern Road Link (NRL)</td>
</tr>
<tr>
<td></td>
<td>Base Case 2 assumes only committed and funded components of the North-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South corridor are developed</td>
<td></td>
</tr>
<tr>
<td><strong>Rail</strong></td>
<td>Existing rail corridor</td>
<td>● GlobeLink rail between Murray Bridge</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and Two Wells</td>
</tr>
<tr>
<td><strong>Intermodal</strong></td>
<td>No change in intermodal facilities</td>
<td>● Intermodal terminal at Monarto or</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tailem Bend</td>
</tr>
<tr>
<td><strong>Air</strong></td>
<td>No direct ADL to LAX flights with all passengers and freight</td>
<td>● Intermodal services continue to use the</td>
</tr>
<tr>
<td></td>
<td>continuing to transit through east coast hubs</td>
<td>existing rail alignment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Direct ADL to LAX flights three times</td>
</tr>
<tr>
<td></td>
<td></td>
<td>per week. These flights operate in</td>
</tr>
<tr>
<td></td>
<td></td>
<td>addition to the existing east coast to</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LAX flights</td>
</tr>
</tbody>
</table>

7.4. **GlobeLink project options**

Each of the shortlisted options are described in the tables overleaf, providing a detailed description of the options and listing the benefits and disbenefits of each alternative. Benefits and disbenefits which have been quantified, and included in the rapid CBA analysis in the following steps are indicated with ‘$’.
This option assesses the viability of new, direct flights to LAX to connect to a new very high-value freight and visitor economy export market.

**Detailed option description:**

This option considers the feasibility of direct RPT flights between Adelaide International Airport (AAL) and Los Angeles International Airport (LAX), operating three times weekly. These are assumed to operate in addition to existing east coast flights to LAX.

This is contemplated through a tripartite agreement, proposed to incorporate:

- **Adelaide Airport** accelerates investment in its freight handling facilities.
- **Reputable airline**: Agrees to commence operations and related marketing.
- **SA Government**: provides a commercially attractive framework to attract an operator to commence direct services, potentially by de-risking ramp-up revenues over a period of 6 to 18 months, amidst other facilitation measures.

**Key benefits & opportunities:**

- Increased exports to LAX from AAL
- Travel time savings for outbound local passengers – business and personal travel
- Increased visitor expenditure in South Australia
- Upgraded handling facilities for all import/exports
- No upfront costs; minimal financial implications on SA Government.

**Key disbenefits & risks:**

- Passenger demand subject to idiosyncratic factors, such as frequent flyer schemes and scheduling.
- Lower than anticipated load factors may require contribution from the SA Government
- Establishing agreeable terms in the tripartite contract, to stimulate interest from airlines
- Industry demand for direct access to LAX market
- Increased imports into SA from LAX

**Other design considerations:** SA Government could consider providing reimbursement for shortfalls in revenues – below a benchmark load factor agreed in the tripartite agreement. The SA Government may also jointly participate in marketing campaigns with AAL and the airline, to stimulate trade and visitation and to increase initial load factors.
Alternative M1 route - "Short South"

This option proposes a new 25 km road, connecting the South Eastern Freeway at Mount Barker to the North-South Corridor (South Road) at St Marys in the south of Adelaide.

**Detailed option description:**
- Construction of a new 25km long road between Mount Barker and South Road at St Marys – with road design following Austroads, DPTI and Australian Standards for best practice methodology.
- The proposed new road will have two lanes in each direction.
- The capital expenditure for construction of the road, of $1,444 million, is based on high level preliminary design; with costs benchmarked on comparable, recently constructed roads.
- The ongoing operational costs of the new road is estimated to incur $23 million.

**Key benefits & opportunities:**
- Road freight operator and customer time savings
- Passenger travel time savings
- Vehicle operating cost savings
- Improved travel time reliability
- Reduced externalities, including crash costs, air pollution and greenhouse gas emissions
- Asset residual value
- Reduced road damage costs
- Avoids restrictive sections of the South Eastern Freeway; and connects the south-east of Adelaide to the North-South Corridor and gateways.
- Land value uplift potential.
- Avoids residential areas and undulating terrain.

**Key disbenefits & risks:**
- Construction costs
- Ongoing operating and maintenance costs
- Construction complexity within the Adelaide Hills.
- Land acquisition.
- Resistance from communities along the proposed route, in southern parts of the Adelaide Hills.
- Upgrades of contiguous roads required to optimise performance.
- Contemporary upgrades of the NS-Corridor do not cater for use of larger HPV vehicles (B-Triples).

**Other design considerations:** Upgrades to interface with existing services will need to be considered at later design stages, as well as geotechnical conditions along the alignment. The proposed cross sections have been selected to be constructible over the existing ground surface, but requires significant further investigation.
Alternative M1 route - “Short North”

This option proposes a new 37km road connecting the South Eastern Freeway at Mount Barker to Grand Junction Road at Hope Valley, in the north of Adelaide.

Detailed option description:
- Construction of a new 37km long road between Mount Barker and Grand Junction Road at Hope Valley – with road design following Austroads, DPTI and Australian Standards for best practice methodology.
- The proposed new road will have two lanes in each direction.
- The route connects the south-east of South Australia and Victoria with the industrial north of Adelaide including the Port and major distribution centres.
- The capital expenditure for construction of the road, of $2,137 million, is based on high level preliminary design; with costs benchmarked on comparable, recently constructed roads.
- The ongoing operational costs of the new road is estimated to incur $34 million.

Key benefits & opportunities:
- Road freight operator and customer time savings
- Passenger travel time savings
- Vehicle operating cost savings
- Improved travel time reliability
- Reduced externalities, including crash costs, air pollution and greenhouse gas emissions
- Asset residual value
- Reduced road damage costs
- Avoids restrictive sections of the South Eastern Freeway and Portrush Road; and connects the south-east of Adelaide to the North-South Corridor and gateways.
- Land value uplift potential
- Avoids residential areas and undulating terrain

Key disbenefits & risks:
- Construction costs
- Ongoing operating and maintenance costs
- Construction complexity within the Adelaide Hills.
- Connection to Grand Junction Road traverses a residential area.
- Land acquisition
- Upgrades may be required to feeder roads to optimise performance; and of Grand Junction Road to permit Type-1 road trains.
- Route bisects Anstey Hill Recreation Park, complex topography with many watercourses, and high bushfire risk area.

Other design considerations: Upgrades to interface with existing services will need to be considered at later design stages, as well as a potential need for road grade separation with Melbourne-Adelaide railway line and geotechnical conditions along the alignment.
This option proposes to provide a dedicated 16.6km road tunnel connection between the South Eastern Freeway east of Crafers and the North-South Corridor at Cross Roads.

Detailed option description:

- Construction of a new 16.6km long tunnel between east of Crafers and South Road at Cross Roads – with tunnel design following Austroads, DPTI and Australian Standards for best practice methodology.
- The proposed, new tunnel will be constructed by boring and cut-and-cover, with portals proposed past Crafers and the end of Cross Road.
- Cut-and-cover method will be used under Cross Road, while boring will be used between Portrush Road and Crafers.
- The tunnel will have two lanes in each direction.
- The capital expenditure for construction of the road, of $18,218 million, is based on high level preliminary design; with costs benchmarked on comparable, recently constructed tunnels.
- The ongoing operational costs of the new tunnel is estimated to incur $43 million.

Key benefits & opportunities:

- Road freight operator and customer time savings
- Passenger travel time savings
- Vehicle operating cost savings
- Improved travel time reliability
- Reduced externalities, including crash costs, air pollution and greenhouse gas emissions
- Asset residual value
- Reduced road damage costs
- Avoids restrictive sections of the South Eastern Freeway; and connects the south-east of Adelaide to the North-South Corridor and international gateways.
- Impacts typically limited to areas surrounding portals.
- Minimal environmental and heritage impacts.

Key disbenefits & risks:

- Construction costs
- Ongoing operating and maintenance costs
- Construction complexity within the Adelaide Hills, with difficult ground conditions and densely populated surrounding urban areas.
- Land acquisition.
- Significant impact to existing network, residents and local businesses during construction with proposed cut-and-cover construction approach on Cross Road.
- Portals potentially located proximate residential areas.
- Tunnel design may restrict type of freight permitted to use the route.

Other design considerations: The tunnel has been designed with a maximum 3 per cent grade between Portrush Road and the exit past Crafers – a grade more than this imposes relative speed reductions on heavy vehicles. An initial entry/exit point was considered at Portrush/Cross Road intersection, but dismissed given constructability issues. Future considerations of geotechnical conditions would be required upon development of the option to later stages – and may significantly impact constructability of the tunnel.
This option proposes a new 150km Freight Rail Line which runs between Murray Bridge and Two Wells, in an arc to the east and north of the Adelaide Hills – and connects into the existing interstate rail lines either side.

**Detailed option description:**
- Construction of a new 150km long rail line which diverts from existing standard gauge interstate line at Monarto, traverses a proposed tunnel at Towita and re-connects with the interstate line at Two Wells.
- The rail design based on ARTC Standards for best practice rail design for single stacking configuration with a maximum train length of 1.8km.
- The proposed rail line will have a maximum design operating speed of 160km/h; and will traverse a range of topography, requiring both tunnelling and bridging.
- The capital expenditure for construction of the new rail line, of $4,743 million, is based on high level preliminary design for a single stack alignment; with costs benchmarked on comparable, recently constructed tunnels.
- The ongoing operational costs of the new rail line is estimated to incur $52 million.

**Key benefits & opportunities:**
- Travel time savings
- Train operating cost savings
- Reduced externalities
- Avoided level crossing delays
- Asset residual value
- Improved liveability for residents in the Adelaide Hills from reduced noise impacts.
- Improved safety and reduced network vulnerability.
- Route is principally located within a rural area and avoids key townships and high bushfire risk areas.
- Opportunity to support agribusiness and mining operations, particularly if supported by an intermodal facility.

**Key disbenefits & risks:**
- Construction costs
- Ongoing operating and maintenance costs
- Land acquisition
- New rail route does not bypass Islington – the major intermodal terminal enabling inbound trains from east of Adelaide to be double stacked – and would require relocation of the intermodal.
- Proposed route requires a number of bridges and tunnels.
- Poor ground conditions may result in the requirement of structural fill to mitigate issues that arise.
- Potentially a need for numerous grade separated crossings with main roads.

**Other design considerations:** The mainline freight link has been designed to minimise the impact to rural communities and avoid geographical features and areas of high sensitivity, however, geotechnical investigation will need to be considered for further development of this option. As part of future design of this option, it is prudent to consider the requirements to allow double-stacking of freight trains along the route.
This option includes the development of a greenfield Intermodal Terminal, situated in Monarto or Tailem Bend – which will interface with existing rail infrastructure and service key industries in the surrounding region.

**Detailed option description:**

- Construction of a new Intermodal Terminal, located in Monarto or Tailem Bend – based on ARTC standards for best practice intermodal design.
- The preliminary design for an Intermodal Terminal is assumed at the Tailem Bend location, adjacent to the existing bulk grain site; and will interface with existing rail lines, currently serving the bulk grain facility. The facility could equally be located at Monarto.
- The $55 million capital expenditure for construction of the Intermodal is based on high level preliminary design; with costs benchmarked on comparable, recently constructed terminals. The ongoing operation of the Intermodal Terminal is estimated to incur $0.6m per annum.

**Key benefits & opportunities:**

- Road transport cost savings
- Reduced road and rail related externalities
- Rail transport cost savings
- Time savings for freight customers
- Asset residual value
- Adjacent to tangent track, and close to the existing road.
- Leverage from available, existing rail infrastructure, in particular existing rail sidings
- Ability to load/unload without blocking existing mainline.
- Potential for further development of a proximate industrial precinct.

**Key disbenefits & risks:**

- Construction costs
- Ongoing operating and maintenance costs
- Anchor tenant risk – which the success of the project dependant on the interest of the private sector.
- Land acquisition
- Industry’s propensity to co-locate and utilise the intermodal facility, given insufficient space adjacent to existing mainline track.
- Interface risks with integration of the facility with existing infrastructure at Down-End of site.
- Upgrades would be required to existing road and rail infrastructure to support the required rail and road traffic, as well as signalling upgrades.

**Other design considerations:** Future design stages are necessary for further development of the option, such as consideration of turnout design and vertical alignment design which have not been developed. A turnout radius has been applied, based on previous ARTC projects. Additionally, Geotechnical investigations should be conducted to determine the suitability of the ground to support the weight of a fully loaded freight train.
### 7.5. Rapid CBA assumptions

#### Table 24: General CBA assumptions

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Road</th>
<th>Rail</th>
<th>Intermodal</th>
<th>Air</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Base year</strong></td>
<td>2018-19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Values</strong></td>
<td>All amounts are indexed to 2018-19 prices</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Real discount rate</strong></td>
<td>7 per cent</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Benefits commence</strong></td>
<td>2025-26</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Evaluation period</strong></td>
<td>30yrs</td>
<td>30yrs</td>
<td>30yrs</td>
<td>10yrs</td>
</tr>
<tr>
<td><strong>Asset life</strong></td>
<td>30 years</td>
<td>50 years</td>
<td>50 years</td>
<td>20 years (aircraft)</td>
</tr>
<tr>
<td></td>
<td>100 years for tunnel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Reference group</strong></td>
<td>South Australian community</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Almost all benefits and costs are unescalated and in real terms (2018-19 prices) with the exception of Value of time savings for passengers and freight operators, which is escalated in real terms in line with assumed movements in real earnings.

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139 Consistent with guidance from Infrastructure Australia’s Assessment Framework
140 Where an asset life is greater than 50 years, the “unused” component is reported as a benefit.
7.6. Quantifying capital and operating costs

Each option’s capital and operating costs have been determined in line with pre-feasibility estimates with an accuracy of circa 50 to 25 per cent.

**Capital options**

Capital costs are based on a five per cent design, with operating costs based on benchmark estimates. Both the capital and operating costs for each shortlisted option are provided below.

**Table 25: Summary of costs**

<table>
<thead>
<tr>
<th>Capital costs</th>
<th>Alternate M1 route – ‘Short South’</th>
<th>Alternate M1 route – ‘Short North’</th>
<th>Cross Road Tunnel – M1 to North-South Corridor</th>
<th>GlobeLink Reference Rail</th>
<th>GlobeLink Reference Intermodal Export Park</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>$823m</td>
<td>$1,218m</td>
<td>$11,627m</td>
<td>$2,606m</td>
<td>$30m</td>
</tr>
<tr>
<td>Land acquisition</td>
<td>Not considered</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design fees and principals cost</td>
<td>$209m</td>
<td>$309m</td>
<td>$2,947m</td>
<td>$782m</td>
<td>$9m</td>
</tr>
<tr>
<td>Contingency</td>
<td>$413m</td>
<td>$611m</td>
<td>$3,644m</td>
<td>$1,355m</td>
<td>$16m</td>
</tr>
<tr>
<td>Total capital costs</td>
<td>$1,444m</td>
<td>$2,137m</td>
<td>$18,218m</td>
<td>$4,743m</td>
<td>$55m</td>
</tr>
<tr>
<td>Operating costs per year</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O&amp;M costs</td>
<td>$23m</td>
<td>$34.1m</td>
<td>$43.4m</td>
<td>$52.1m</td>
<td>$0.6m</td>
</tr>
</tbody>
</table>

**More planes, more freight**

With limited capital costs, the estimated costs for the airport option is based almost entirely on the expected operating costs and revenues generated as a result of implementing the option. For the purposes of the assessment, financial assessment of the costs and revenues for the operator have been considered – as opposed to a conventional economic assessment which look at the costs and benefits for the economy.

A capital cost of US$245 million has been considered for the aircraft (purchased second hand at a 50 per cent reduction)\(^{141}\) and a weighted average cost of capital of $12.9 million\(^ {142}\). Operating costs for the air service between AAL and LAX have been estimated by KPMG using block hour unit rates for a 787-9, drawn from the US Department of Transportation data, with indirect costs considered using benchmarks. Operating costs also include landing fees and taxes at both AAL and LAX.

Revenues obtainable through the new route are based on assumed load factors (the percentage of available seats occupied) of passengers and freight, reflective of projected demand. The assumed load factors have

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\(^{142}\) Based on an assessment of Qantas, Delta, American Airlines and United Airlines
been set at lower levels compared to projected load factors estimated from high-level route choice modelling, which have accounted for price, travel time and number of stops, as well as weekly service frequency\textsuperscript{143,144}.

7.7. Quantifying economic benefits

The economic benefits of the options are calculated and expressed in incremental terms relative to the respective base case, representing benefits to the whole of South Australia. All the benefits which have been monetised within the CBA are summarised in Table 26.

Table 26: Option benefits summary

<table>
<thead>
<tr>
<th>Mode</th>
<th>Benefits assessed</th>
</tr>
</thead>
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<td>Road</td>
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<td>• Vehicle operating cost savings</td>
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<td>• Environmental externalities</td>
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<td></td>
<td>• Air pollution and greenhouse gas reductions</td>
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<td>Rail</td>
<td>• Value of time for freight customers</td>
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<td>• Avoidance of level crossings</td>
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<td>Air</td>
<td>• Travel time savings</td>
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<td>• Induced air exports</td>
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<td>• Induced tourism benefits</td>
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The key considerations in assessing and quantifying the benefits for each mode are summarised below, with further detail regarding the inputs and methodology for each benefit provided in Appendix 3.

**Road** | The benefits identified for the road options are described below.

**Travel time savings**
Time savings make up a substantial proportion of the overall benefits for road, reflecting the faster journeys and congestion relief provided by the road options considered. For passenger travel time savings, this benefit has been quantified with reference to the value of personal and business travel relative to average weekly earnings, with demand outputs drawn from MASTEM. The value of personal travel time is $15.41 per (passenger) hour with business travel time $50.08 per hour.\(^{145}\)

The benefit of freight and freight operator travel time savings has been assessed with reference to a heavy rigid truck, with travel time savings calculated for freight operators and metropolitan freight at an average payload of 75 per cent\(^ {146} \).

**Vehicle operating cost savings**
Vehicle operating costs (VOCs) savings result from faster journeys and congestion relief. VOCs have been quantified using ATAP guidance, which accounts for changes in fuel consumption, lubricants, tyres, vehicle capital costs, repairs and maintenance. VOCs were estimated using a link by link basis, allowing for consideration of changes in speed on individual links, as well as allowing for the assessment of VOCs on both urban and rural roads.

**Reliability benefits**
Travel time reliability benefits reflect the value of reducing potential variability in journey time. Modelled changes in travel time variability have been undertaken on a link-by-link basis, using the NZ Transport Agency’s approach that assesses changes in the standard deviation of travel time relative to a link’s vehicle capacity ratio (i.e. vehicle flow relative to its capacity).

**Crash cost savings**
Changes in crash costs reflect changes in the number of vehicle kilometres travelled as well as changes in travel on different types of roads. Different crash rates have been assumed for urban travel versus rural travel as well as travel along divided and undivided roads.

**Road damage savings**
Heavy vehicles are a major contributor to road pavement deterioration, often accelerating the requirement for road maintenance. A reduction in heavy truck traffic therefore will create a benefit in reduced road damage costs.

Using TfNSW guidelines, road transport costs were determined using cost per vehicle kilometre travelled at a cost of 14.98 cents for heavy vehicles and 4.36 cents for a car.

**Environmental externalities, including air pollution and greenhouse gas reductions**
Environmental externalities value changes in the greenhouse gas emissions, air pollutants, noise pollution, water pollution, nature and landscape and urban separation resulting from changes in road and rail travel.

Greenhouse gas and air pollution estimates are based on changes in fuel consumption, linked closely with changes in vehicle operating cost. These valuations have been derived on a link-by-link basis. Other environmental benefits were estimated based on changes in vehicle kilometres travelled and by road type.

\(^{145}\) Based on ATAP Guidelines. Personal VOT is 40% of Adelaide average weekly earnings and business VOT is 130% of average weekly earnings, using a 38 hour working week.

\(^{146}\) Freight value of time based on Wigan et al., 1998, Valuing Long-Haul and Metropolitan Freight Travel Time and Reliability.
Rail | The benefits identified for the road options are described below.

**Value of time for freight customers**
Reducing the time required for freight to arrive at its destination creates a benefit for customers. This benefit is based on changes in tonne hours, with changes in time driving this metric. For this option, the inter-capital value of freight time was used, valued at $1.12 per tonne hour. 147

**Rail freight transport cost savings**
Rail freight transport costs include train operating costs, train capital and maintenance costs, crew costs, and track access charges. Changes to rail freight transport costs occur in instances where there are changes in the route, number of services, or train configuration.
The impact of the rail option was considered with reference to train travelling between Murray Bridge and Two Wells. Track access charges for the route were assumed equal to current ARTC levies.

**Crash cost savings**
Changes in crash costs occur with a change in route or quantity of rail freight as they are calculated on a net tonne-kilometre basis. The cost of rail crashes is based on ATAP guidance and is 0.05 cents per net tonne-kilometre.

**Avoidance of level crossings**
The proposed rail line would bypass several high-volume level crossings, delivering time savings and vehicle operating cost savings. It is assumed that the level crossing closes for approximately 150 seconds per train and that the average vehicle would wait half this time (75 seconds). In addition, avoided fuel consumption for vehicles was calculated, based on average fuel use of 0.05 L per stop at a level crossing.

**Environmental externalities**
For rail, environmental externality costs consider the options impact on greenhouse gas emissions and other air pollutants, noise pollution, water pollution, nature and landscape, and urban separation.
Greenhouse gas emissions and air pollutants are estimated based on changes in fuel consumption. Other externalities are calculated on a net tonne-kilometre basis. Net tonne-kilometres are derived from the average payload per train, the number of round trips, and the distance travelled in rural and urban areas.
In addition, an alternative method to valuing noise pollution was considered for rail, based on high-level hedonic analysis of property prices across Adelaide. However, the hedonic analysis indicates that rail freight line services have a statistically insignificant impact on house prices.

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147 Freight value of time based on Wigan et al., 1998, Valuing Long-Haul and Metropolitan Freight Travel Time and Reliability.
Intermodal | The benefits identified for the road options are described below.

Value of time for freight customers
The change in time required for freight to arrive at its destination seen from the introduction of the intermodal option was assessed, as with rail, using the average time saving provided by the upgrade option, with consideration of the value of time for freight. For intermodal, as with the rail option, this was estimated using an inter-capital value of freight time of $1.12 per hour.

Road freight transport cost savings
The introduction of the intermodal terminal will see a shift of freight from road to rail, resulting in road freight transport costs savings, such as vehicle operating cost savings and freight operator time savings. The reference trip for this option is between Tailem Bend and Pelican Point (Port Adelaide). A B-Double is assumed as the reference truck.

For road, VOC savings are calculated using ATAP’s approach, based on the reference trip and average speeds for different road types (urban ‘stop-start’, urban ‘free-flow’ and rural). For B-Double road freight operators, the value of time is $31.68 per hour.148

Rail freight transport cost savings
Shifting freight from road to rail will result in an increase in rail transport costs as a new rail service would need to be provided. As with road, the reference trip is between Tailem Bend and Pelican Point using the current rail line. Rail transport cost savings are calculated in the same way as adopted for the valuation of the rail option but using a specific intermodal train configuration.

Crash cost savings
Changes in crash costs reflect the reduction in the exposure to potential crashes on the road network, and the increase in potential crashes on the rail network, albeit there is a net savings with rail typically being safer of the two modes. Road and rail crash costs are calculated as previously described.

Road decongestion cost savings
Introducing an intermodal terminal could bring road decongestion benefits, by removing trucks from the road, thus improving the flow of the road network. The cost saving from road decongestion was estimated based on BITRE estimates of the cost of congestion per (car) kilometre, with this rate adjusted for the additional capacity used by B-Doubles relative to cars.

Road decongestion costs have not been explicitly estimated for the road options, as they are incorporated in the road travel time and vehicle operating cost benefits.

Road damage savings
Heavy vehicles are a major contributor to road pavement deterioration, often accelerating the requirement for road maintenance. A reduction in heavy truck traffic therefore will create a benefit in reduced road damage costs.

Environmental externalities
Rail and road environmental externality costs have been estimated under the same approach described for the road and rail options above, but using the reference route between Tailem Bend and Pelican Point, the Tailem Bend intermodal train configuration and B-Double reference vehicle.

148 Based on Austroads, using Road Transport and Distribution Award, indexed to 2018-19 prices.
The benefits identified for the road options are described below.

**Travel time savings for South Australian passengers**

This benefit considers the time savings through a new, direct flight between ADL and LAX, for both existing passengers flying through other gateways (i.e. Sydney, Brisbane or Melbourne), and new passengers that choose to fly to LAX as a result of the new direct flight. As the economic appraisal considers the benefits to South Australia, local passengers have been considered. For induced demand, the rule of half has been applied.

Total flying time is not reduced significantly as a result of the direct service to LAX. As such, most of the benefits relate to time saved that would otherwise be spent in layover, typically between 90 and 120 minutes.

This benefit calculation uses the air value of time, as advised by the Civil Aviation Safety Authority (CASA). This guidance suggests that air value of time is linked to the level of average weekly earnings. For business travellers, the value of time is $23.36 per hour, while for personal travel it is $21.02 per hour. It was assumed that 10 per cent of travel from Adelaide to the USA is business travel, according to AAL estimates.

It should be noted that the disutility associated with the inconvenience and stress of a transfer has not been valued.

**Induced air exports from South Australia to the USA**

A new direct passenger air service between ADL and LAX will provide new opportunities for South Australian businesses to export to the USA. New exports would provide a benefit to the South Australian economy. This benefit has been calculated based on AECOM air freight forecasts, and assumes the new exports will have the same composition as current exports.

The economic benefit of new exports was calculated using the free on board (FOB) price for each export category, and the gross operating surplus for key air freight export industries, including meat, chemical products, vehicles, aircrafts, vessels and transport equipment, machinery and equipment, and other.

Note that increased imports have not been considered as the guidance and research are scarce in this respect. In addition, it is unlikely that increased imports from LAX will have a material negative impact as most imports would not be substitutes for South Australian goods.

**Induced tourism benefits from additional international visitors**

The new direct service between AAL and LAX would see induced demand, which would benefit the South Australian economy by increasing the number of tourists visiting the state from the USA.

The estimated benefit considers the number of new tourists visiting South Australia, the tourism industry gross margin, as well as the average expenditure per visit from a North American tourist visiting South Australia (based on South Australia Tourism Commission research).

Any dis-benefits from South Australian tourists travelling to North America that would otherwise have stayed in South Australia have not been considered. The guidance on such tourism ‘imports’ is scarce and it was determined that those South Australian tourists who do elect to travel to LAX are likely choosing that destination over another interstate/international destination rather than an intrastate holiday.

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149 AECOM, Air Demand Forecast Report, 2019
151 REMPLAN, 2019
152 REMPLAN, 2019
7.8. Calculating the net benefits of GlobeLink options

The net economic merit of the shortlist options have been assessed through reference to two key tests of economic viability, including:

- The NPV which indicates the magnitude of net benefit to society and is equal to the present value of benefits less the present value of costs. Positive NPVs indicate that an investment is desirable to society as a whole; and
- The BCR is the economic measure of value for money for public expenditure and is of principal value when government considers spending scarce funds. The BCR is calculated by dividing the present value of benefits by the present value of total costs (investment costs and net increase in operating costs)\(^\text{153}\). BCRs greater than 1.0 indicate that an investment has economic merit.

The following figures provide a representation of the outcomes of the NPV and BCR analysis. This analysis has been undertaken using present values, with a 7 per cent discount rate. Sensitivity of the impact of using different discount rates is provided in Section 7.8.1.

**A solution to the south east’s missing link would bring substantial benefits, but is sabotaged by low demand…**

Each of the road options provides relatively stable benefits, with the present value of travel time and vehicle operating costs ranging from $191 million to $232 million, across the three options. These were joined by safety and other benefits. The longer economic life of a tunnel also inflates the benefits of the Cross Road Tunnel option, due to the residual asset value.

These solid benefits are outweighed by each project’s costs, with the rapid CBA showing negative BCR and NPV results for each road.

This does not mean there is not a case for a safe, efficient contiguous road connection from the south-east to Adelaide’s motorway network – simply that the costs are high versus the low projected demand. The benefits achieved by roads are a factor of volumes, meaning that an increase in demand would in turn increase the benefits versus the costs.

These results have eroded slightly since the ‘rapid-rapid’ assessment, with closer examination revealing challenging terrain and other factors which have increased the capital and operating cost assessments in each case.

These results suggest that initial efforts should be focused on incremental safety and efficiency upgrades to the existing road corridors, atop already planned initiatives.

In the context of Growth State and other initiatives like the 20 year State Infrastructure Strategy, consideration should be given to connecting land use decisions to the transport requirement for a safe, efficient motorway connection from the south east.

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## Alternative M1 Route – ’Short North (Sm)

<table>
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<tr>
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<th>BENEFITS &amp; DISBENEFITS</th>
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<th>BCR</th>
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## Cross Road Tunnel – M1 to North-South Corridor (Sm)

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<td>Road damage savings</td>
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<td>Rapid BCR</td>
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Rail sees the lowest BCR, because of low demand and very high costs

The GlobeLink Reference Rail route tested routing rail freight services via the new alignment, rather than the existing rail alignment. Our analysis shows the lowest net results of all of the capital options investigated, with a BCR of 0.08 and NPV of -$3.7 billion.

The figure below shows our assessment of benefit and costs – and shows a deterioration of the economic case for an Adelaide Hills rail alignment, since the 2010 Adelaide Rail Freight Movements Study.

This further deterioration is a result of higher undiscounted capital costs, the inclusion of annual operating costs in our assessment; and more subdued demand forecasts based on the GlobeLink supply chain study and analysis of recent trends in South Australia’s freight movements.

GlobeLink Reference Rail ($m)

This outcome is a deterioration since the 2010 Adelaide Rail Freight Movements Study, due to higher undiscounted capital costs, the inclusion of annual operating costs, and the demand forecasts used being much more subdued than the previous estimates.

The intermodal reference project provides strong benefits – but still do not cover the estimated costs

The economic appraisal of the GlobeLink Reference Intermodal Export Park considers moving containerised freight via rail versus road using the existing alignment. Compared to the other capital options considered, the intermodal option provides the greatest benefits relative to its costs, however, even in this case, the costs outweigh the benefits, with an expected net present value of -$19 million, and a BCR of 0.6.

Much of the benefits arise from externalities – environmental, crash or decongestion externalities. These benefits outweigh the transport cost benefits that arise, whereby the avoided road transport cost savings are whittled away by combined increase in rail transport and intermodal operating costs.

GlobeLink Reference Intermodal Export Park ($m)
The development of the intermodal facility at Monarto or Tailem Bend, while potentially impacting on the amenity of surrounding residents and businesses, may deliver a lower whole of life cost. Sensitivity analysis has been undertaken to assess the viability of this more economic sub-option in Section 7.8.1 below.

Our analysis shows a direct air connection to LAX is economic – and commercial

This scenario assesses a 787-9 aircraft operating RPT services three times per week, between Adelaide Airport and LAX, providing a new market connection for tourism and freight exports. Our assessment in Figure 75 below indicates our analysis of the substantial economic benefits available from attracting a connection between the West Coast of the USA and Adelaide.

Freight contributes the highest benefit; followed by travel time savings to Adelaide customers. Direct services also provide opportunities to attract visitors, from which increases in visitor expenditure contribute directly to higher levels of economic activity. Over the first 10 years, the value of these benefits is worth approximately $90 million in discounted terms.

Even on conservative load factors our financial analysis indicates that the service should be sufficiently popular to avoid the need for financial assistance. A financial assessment of the potential costs and revenues suggests that the new route will be profitable – with projected net revenues of $190,000 in the first year, and an NPV of $32.7 million over ten years.

That said, attracting an operator to make the commitment may require short term measures to de-risk the entry and ramp up period. These could conceivably include short-term revenue guarantees for say 6-18 months; marketing support or other minor measures.
7.8.1. What changes can be made to help GlobeLink stack up?

This section exposes the rapid BCRs to a range of scenarios to test the impact of sensitivities like discount rate, capital costs, operating costs, timing of delivery, the evaluation period, as well as other option specific sensitivities.

In addition, a breakeven analysis was undertaken for the capital options. The results of this assessment are provided below.

**Integrated cost reductions, land use planning and significant development is needed for road to make sense**

The road options sees very little fluctuations in its BCR analysis for the most part – even with significant reductions in costs, the time and vehicle operating cost savings benefits are limited by low volumes expected along the new road connection, driven by Adelaide’s forecast low population growth and subdued economic activity.

To this end, driving stronger demand can be expected to influence the benefits achieved by the potential road alignments, with land uplift considerations, such as implementing reformed land use policy adjacent to the new route, providing significant uplift – although, not enough in isolation to justify the investment.

![A combined cost reduction scenario, reducing the road from four lanes to two, with appropriate passing lanes, coupled with complementary land use changes equivalent to 10,000 new housing lots, provides substantial improvement to the ‘Short South’ results, with its BCR improving substantially, to reach 1.26](image)

While this combined assessment increased the ‘Short North’ option significantly, the BCR remains below one at 0.8, with costs continuing to outweigh benefits delivered by the option. The assessment was not undertaken for the Cross Road Tunnel option, which saw limited impact from land use uplift.

**Figure 77: Alternative M1 Route – ‘Short South’**

**Figure 78: Alternative M1 Route – ‘Short North’**
The GlobeLink reference rail project scores poorly under all scenarios

The GlobeLink reference rail project consistently performs poorly under economic appraisal, even when costs are halved, under any evaluation period or discount rate. This demonstrates the lack of demand for rail, with the case for rail continue to deteriorate since its last investigation in 2010. Figure 80 provides sensitivity analysis results that are at their highest a BCR of 0.19 – under a very low discount rate scenario.

The GlobeLink intermodal export park could provide a positive return – if costs are significantly reduced

The intermodal export park achieves the highest core BCR result; and sees material improvements under scenarios where costs are reduced below the reference case. The decrease in costs have only made marginal improvements to the BCR’s of other options, given the overall quantum of capital investment required for the road and rail options. The much more modest capital cost of the intermodal export option means that it is much more sensitive to improved results where costs are reduced.

Despite the economic appraisal showing some possible potential under favourable scenarios – the feasibility of the intermodal terminal is ultimately dependent on the ability to attract an anchor tenant. If the private sector are not willing to co-invest by relocating facilities to the new intermodal facility, the project will not bring any benefits.
A new air connection is sensitive to passenger uptake with different loading scenarios seeing some down-side potential

Our consultations with the aviation industry and key industry stakeholders suggest that global airlines have been cautious about considering direct Adelaide connections to the USA, beyond the major east coast capitals. This is principally concerned with their perception of passenger load risks from smaller Australian cities.

Figure 82 below shows our sensitivity analysis of the financial impact of the new route over ten years, without any SA Government support.

The core result and high load factor show strong upside potential for the airline operating the new route, with some downside risks for other scenarios. The low load factor scenario assumes a slower ramp up periods, 9 per cent growth over 18 months, and ends with 65 per cent load factor. In comparison the core scenario has 16 per cent growth over 12 months, with an end load factor of 75 per cent.

Additionally, the core result assumes that the direct service will see a premium in airfares compared to indirect services, however removing this premium, with prices equal to the indirect service, show the down-side potential is more significant that the lower load growth scenario. While this considers the downside potential, it is considered unlikely that there will be no airfare premium obtainable for the direct service compared to indirect services.
PART D: Key findings and next steps

This final section of the GlobeLink Scoping Study draws on technical and economic evidence and analyses undertaken throughout the Study, to support informed decision-making on the progression, if any at all, of the GlobeLink Policy.

To ensure the best outcomes for South Australia, the GlobeLink Scoping Study included a bottom-up analysis across a wide array of options – working alongside SA Government representatives and industry stakeholders, through a series of workshops, reference group meetings, reviews and assessments – and finally, supported the decision to proceed with evidence garnered through economic appraisal of the shortlist options.

This process allowed for an unbiased, unconstrained deep dive examination into the best strategic options that are available to stimulate growth in the State – where transport infrastructure is seen as a growth enabler in South Australia.

The GlobeLink Scoping Study conclusion drawn in this section provides a basis for further development of the potentially viable options, lays out a roadmap that will navigate the steps to best deliver the GlobeLink objectives - and ultimately maximise value for money for all of South Australia.
8. **GlobeLink: Findings & recommendations**

8.1. **GlobeLink findings**

A key finding of the GlobeLink Scoping Study is that initiatives are needed to increase population growth, economic activity and growth. Our analysis shows that a key challenge facing infrastructure project investments and the wider outlook for South Australia is slow population growth sees low demand, in turn reducing investment, employment and consumption.

Low demand is the reason why the BCR’s of the capital options have struggled to reach positive territory, without substantial enabling changes in land use.

Despite this, the Scoping Study identifies a range of important insights to inform infrastructure and freight policy in South Australia.

1. Unlike to the north and north-east of Adelaide, the National Land Transport Network to the south-east of Adelaide experiences significant transport efficiency, safety and amenity challenges. This is primarily due to the steep road and rail corridors that traverse through the Adelaide Hills and south-eastern suburbs, in proximity to well-established residential areas.

   The existing road corridor has no contiguous motorway link from the south-east to the north, and experiences congestion on the Adelaide plains and bottlenecks around Stirling. There are significant safety issues with heavy vehicles travelling down the hills face zone, and the advent of Higher Productivity Vehicles will only serve to strengthen safety and amenity concerns.

   The existing rail corridor through the Adelaide Hills has spare capacity. The slow travel speeds as a result of steep and circuitous alignment, combined with a single stack limitation, impacts upon rail’s competitiveness with road. The noise from operations also impacts upon residents in the Adelaide Hills and on the Adelaide plains.

2. These constraints limit the State’s productivity in the freight transport sector, and impose a cost on movements between Adelaide and the east coast.

3. With spare airside capacity at Adelaide Airport, there is a distinct opportunity to provide more direct connections to new international destinations to open up additional export markets for South Australian producers. When combined with additional seats, these new flights have the benefit of broadening the State’s high value freight and visitor export economy.

4. With recent channel upgrades and spare quayside capacity, the Inner/Outer Harbors in Adelaide are well placed to accommodate increased export trade growth for the state and nation.

5. Several connectivity options to the south-east (road, rail, air and intermodal) were explored to address the above problems and explore opportunities to deliver upon the objectives of GlobeLink. Options include the proposed GlobeLink solution, along with other infrastructure/non-infrastructure alternatives.

6. The original scope of a road bypass to the north and a freight only airport were found to be unviable and were not shortlisted.

7. Preliminary analysis of the shortlisted road and rail alignment options has found that the high cost of such infrastructure will unlikely to be justified based upon assumed population and employment projections.

8. Preliminary BCRs range from 0.08 to 0.21.

9. The alignments provide travel time, operating cost and safety benefit, demand is insufficient to justify the investment without integrated changes to land use policy to increase demand.

10. Preliminary analysis indicates that the scale of land use change along new corridors required to support a new road would need to be significant.
11. These corridor and integrated land use options should be considered in the context of South Australia’s long-term infrastructure strategy.

12. In the near term GlobeLink objectives are more likely to be efficiently achieved through targeted upgrades to the existing roads and rail corridors which reduce supply chain costs and increase safety and amenity in ways that are affordable for industry and taxpayers.

13. Given the excess capacity at Adelaide Airport combined with low volumes, a new competing freight airport to the east of the Adelaide Hills is not considered justified.

14. An intermodal facility to the east of the Adelaide Hills has a greater potential than the other shortlisted options to increase accessibility to rail services for businesses in the region, however it will require a bespoke low-cost and scalable solution to improve its prospects of viability.

8.2. GlobeLink recommendations

1. Increases to productivity of the National Land Transport Network to the south-east/Victoria, and the economic contribution that South Australia derives from it, should focus on the existing road and rail corridors for the short-medium term.

2. As a priority, as funding becomes available, further investigate and develop concept designs and full business cases for:
   a. Targeted upgrades to key sections of the South Eastern Freeway, Portrush Road, and Cross Road corridors that will address safety issues and deliver improved network efficiency.
   b. Potential incremental and localised upgrades to the existing freight bypass route to the east of the Adelaide Hills (between Murray Bridge and the Sturt Highway) to address current constraints and accommodate increased levels of Higher Productivity Vehicles.
   c. Treatments to the existing rail corridor to reduce noise impacts and other impacts upon residents in the Adelaide Hills and suburbs.

3. The ‘Short South’ option between the South Eastern Freeway and the North-South Corridor, in consideration of potential future land use uplift, would only be a long term possibility and is not a priority for investigation at this time.

4. The State Government support (in principle) a market-led and scalable approach for intermodal capacity to the east of the Adelaide Hills to increase access to rail for business in the region, and increase demand for rail freight services in South Australia.

5. The State Government work with Adelaide Airport Limited to attract new direct Regular Passenger Transport (RPT) airline services, including between Adelaide and the US West Coast, to provide additional high value export capacity and wider economic benefits consistent with Growth State.
Appendices

Appendix A. Review stage 1 – results

Appendix B. Stage 2 review results
## Non-capital strategic options

### Table 27 Review of non-capital stage 1 results

<table>
<thead>
<tr>
<th>Name &amp; Description</th>
<th>Relevance to the Problem &amp; Opportunities?</th>
<th>Strengths</th>
<th>Weaknesses</th>
<th>Progress to Review Stage 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Heavy vehicle road pricing</strong></td>
<td>Yes</td>
<td>- Supports a shift of modal choice from road to rail for freight operators and/or commuters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Road pricing reformed to influence behaviours on major road freight routes, based on:</td>
<td></td>
<td>- May reduce congestion on the road network</td>
<td>- Increased costs for freight and/or commuters using the road network.</td>
<td>Yes</td>
</tr>
<tr>
<td>- Time, distance, mass and location based charging used to improve efficiency and safety of road freight task</td>
<td></td>
<td></td>
<td>- Potential risk that industry or community may oppose its introduction</td>
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<tr>
<td>- Applied to all heavy vehicles</td>
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<tr>
<td>- Not applied to light vehicles</td>
<td></td>
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<tr>
<td><strong>Modernise transport regulation</strong></td>
<td>Yes</td>
<td>- Attracts private investment, where reforms establish a supportive regulatory environment</td>
<td></td>
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</tr>
<tr>
<td>Relevant transport, safety and wider legislation and regulation reforms to provide for efficient testing and licensing of ‘breakthrough’ technologies. Examples could include autonomous freight vehicles, freight drones and others.</td>
<td></td>
<td>- Promotes innovation and adoption of technologies that could, in turn, reduce supply chain costs</td>
<td>Potential for externalities associated with new technologies, e.g. drone noise.</td>
<td>Yes</td>
</tr>
<tr>
<td>Name &amp; Description</td>
<td>Relevance to the Problem &amp; Opportunities?</td>
<td>Strengths</td>
<td>Weaknesses</td>
<td>Progress to Review Stage 2</td>
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<tr>
<td><strong>Road network operational reforms</strong></td>
<td>Yes</td>
<td>- Promote increased free flow traffic speeds</td>
<td>Does not address amenity impacts of heavy vehicle use in residential areas.</td>
<td>Yes</td>
</tr>
<tr>
<td>A broad suite of potential operational changes across the road network, which could include:</td>
<td>- Improve road freight efficiency</td>
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<tr>
<td>- Dynamic or optimised signal sequencing across the road network;</td>
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<tr>
<td>- Clearway extensions / introductions to increase capacity;</td>
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<tr>
<td>- Create priority freight lanes to separate freight and other road users; or</td>
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<tr>
<td>- Vary road speeds to meet demand and conditions</td>
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<tr>
<td><strong>Increase the reach of HPVs</strong></td>
<td>Yes</td>
<td>May facilitate efficiency improvements, allowing for larger HPV use on key freight routes.</td>
<td>Potential safety impacts associated with larger heavy vehicles or relaxed speed limits on the South Eastern Freeway.</td>
<td>Yes</td>
</tr>
<tr>
<td>Identify where current operating restrictions or prohibitions can be changed to increase reach of Higher Productivity Vehicles, including:</td>
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<tr>
<td>- Enabling HPVs to enter Adelaide from the south-east</td>
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<tr>
<td>- Increase the safe operation of HPVs across the wider network</td>
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<tr>
<td>- Work with councils to encourage consistent HPV rules to address first/last mile issues</td>
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</tr>
<tr>
<td><strong>Increase public transport use</strong></td>
<td>Yes</td>
<td>- Increased public transport use to reduce congestion on key freight routes</td>
<td>- Commuters may not use public transport infrastructure, particularly given Adelaide’s high commuter mode share to road</td>
<td>Yes</td>
</tr>
<tr>
<td>Encourage commuter mode shift to public transport, for example through:</td>
<td>- Positive environmental externalities compared to commuters travelling via the road network</td>
<td>- Some initiatives may be met with community opposition e.g. increased parking fares</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Attractive fare pricing</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>- Improved mode integration</td>
<td></td>
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<tr>
<td>- Improved PT service quality</td>
<td></td>
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<td></td>
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<tr>
<td>- Vehicle or parking fees</td>
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</tbody>
</table>
### Increase freight rail use
Incentives could improve the (very) low volumes of containerised and bulk freight movements, which currently and increasingly traverse the GlobeLink study area and Greater Adelaide on heavy freight vehicles. The higher costs of rail freight discussed in Part B mean direct cash subsidies would likely be required.

<table>
<thead>
<tr>
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</table>
| Yes                                      | - Increased competiveness for rail freight, promoting increased mode share  
- Positive environmental externalities relative to freight travelling via the road network | Mode-shift decisions are not always linked to price, with incentives failing to address rail connectivity, flexibility etc. | Yes |

### ADL flexibility initiatives
Identify and remove any operational constraints impacting air freight to/from South Australia, potentially including:
- Reduce or remove the airport curfew at ADL or consider performance-based approach
- Introduce flexible shoulder periods
- Increase resourcing for IMEX border processes at ADL

<table>
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<tr>
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<th>Weaknesses</th>
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</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Facilitates improved supply chain flexibility</td>
<td>Increased airport operating hours may negatively impact amenity for surrounding residents.</td>
</tr>
</tbody>
</table>

### More flights, more freight
South Australia’s low level of direct international passenger flights sees correspondingly low levels of freight capacity, which is most often carried on regular passenger flights. Few flights sees limited capacity, connecting to few markets. This strategic option could include direct measures to increase the attractiveness and/or reduce financial risks to potential operators for a defined period. Aligns with SA Growth State.

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</table>
| Yes                                      | - Strategies can be targeted to improve market access to export markets with high potential for growth  
- Increased flight paths to key export destinations  
- Market access to new destinations  
- Past evidence suggests that new flight paths can increase exports to new destinations (e.g. the Middle East) | - Government expenditure may be required for flight paths that would not be commercially viable on their own  
- Incentives must be well designed to ensure their desired impact is realised and not reallocated to other operations (i.e. by underwriting demand) | Yes |
<table>
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</tr>
</thead>
</table>
| Protect future lands and corridors                     | Yes                                       | - Provide land access to accommodate key infrastructure developments in the longer term  
- Ability for investment timing to align with evidence base | Does not address problems / opportunities.                                  | Yes                        |
<p>| Formalisation of road / rail curfews                   | Yes                                       | - Reduces congestion during peak times                                     | - Reduced flexibility for heavy vehicles                                   | No                         |
|                                                        |                                           | - Provides safety and amenity benefits for residents along freight corridors, during curfew hours | - May divert heavy vehicles to other arterial roads during curfews            |                            |
|                                                        |                                           |                                                                           | - Addresses only one problem statement limiting the potential benefit        |                            |
| De-centralisation / transit-oriented development        | No                                        | Facilitates reduced congestion in the CBD.                                | Reduced agglomeration benefits associated with co-location of businesses in the CBD | No                         |
| Research &amp; development in rail technology              | No                                        | Allows increased monitoring of rail infrastructure performance.           | Does not address the problem / opportunity statements.                      | No                         |
| Stevedore competition                                  | Yes                                       | Promotes more efficient stevedore operations at Outer Harbour due to competition. | - Capital investment for a new stevedore would require to be amortised over container throughput, which may increase prices at Outer Harbour and result in adverse impacts | No                         |</p>
<table>
<thead>
<tr>
<th>Name &amp; Description</th>
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</tr>
</thead>
</table>
| **International liner subsidisation**  | Yes                                       | Provides greater network connectivity and market access to export destinations. | - No evidence to suggest that increased market access at the Port of Adelaide would provide a material increase in throughput  
- Exporters may choose more competitive rates at the Port of Melbourne | No                         |
| **Inland ports**                       | Yes                                       | Supports improved capacity at Outer Harbour.                               | There does not appear to be a capacity issue at the Port of Adelaide requiring de-centralisation of dockside activities.               | No                         |
| **Alignment with import requirements** | Yes                                       | Supports increased access to export markets.                              | Only limited ability to influence international markets with recognition for import requirements met in SA.                           | No                         |
| **Integrated urban planning**          | Yes                                       | - Promote efficiency gains from co-location and clustering  
- Improved alignment between transport infrastructure and land use to optimise infrastructure investments | Difficult to implement as it needs to be considered as a component of the wider freight strategy and town planning.                   | No                         |
<table>
<thead>
<tr>
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</thead>
</table>
| Freight consolidation centres              | Yes                                       | Facilitates efficiency gains from co-location and clustering.              | - This strategy is less effective for Adelaide as it does not possess highly dense urban areas  
- There is insufficient current or forecasted demand to warrant this intervention | No                         |
| Port Community System (PCS)                | Yes                                       | Standardised communication platform for supply chain participants which can reduce dwell time at the Port of Adelaide. | - Requires participation and data sharing from supply chain participants  
- The relatively low volumes through the Port of Adelaide mutes the effectiveness of a PCS, making this intervention unnecessary | No                         |
| Freight Strategies                         | Yes                                       |                                                                           | - Collaboration with industry participants to improve understanding of supply chain needs  
- Identification of opportunities to improve protection of strategic freight transport corridors and hubs  
- Identification of opportunities to improve the regulatory environment for freight transport and reduce red tape for business | Outside the remit of GlobeLink. | No                         |
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Council amalgamations</td>
<td>No</td>
<td>- Facilitate planning that considers a wider geographic area</td>
<td>- Does not address the problem / opportunity statements</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Promote economies of scale within councils</td>
<td>- Potential for legal opposition</td>
<td></td>
</tr>
<tr>
<td>Grain container standardisation</td>
<td>No</td>
<td>Consistency in grain containerisation, possessing efficiency improvements through economies of scale when transporting.</td>
<td>May only provide a small efficiency benefit.</td>
<td>No</td>
</tr>
<tr>
<td>Flexibility of customs locations</td>
<td>No</td>
<td>Creates additional capacity at the Port of Adelaide</td>
<td>Currently there does not appear to be a capacity issue in regard to customs processes</td>
<td>No</td>
</tr>
</tbody>
</table>
### Capital strategic options

**Table 28 Review of capital stage 1 results**

<table>
<thead>
<tr>
<th>Name &amp; Description</th>
<th>Relevance to the problem &amp; opportunities?</th>
<th>Strengths</th>
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<th>Progress to Review stage 2</th>
</tr>
</thead>
</table>
| **Cross Road tunnel - M1 to North-South Corridor** | Yes | - Most direct route to Port and Airport (avoids Hills bypass)  
- Optimises existing / planned infrastructure (North-South Corridor) | Tunnelling incurs relatively high capital costs per metre. | Yes |
| Cross Road & South Eastern Freeway upgrades | Yes | - Most direct route to Outer Harbour and Adelaide Airport (avoids the need for an Adelaide Hills bypass)  
- Optimises existing / planned infrastructure (North-South Corridor) | Diverts traffic flow from one highly residential area (Portrush Rd) to another - i.e. does not move heavy vehicles away from residents. | Yes |
| **GlobeLink Reference Road** | Yes | - Bypass of the Adelaide Hills, avoiding the undulating topography which reduces speed and efficiency  
- Allows heavy vehicles to bypass arterial roads in the south-east of Adelaide metropolitan area | Increased distance associated with bypassing the Adelaide Hills may incur additional time and cost for road freight. | Yes |
<table>
<thead>
<tr>
<th>Name &amp; Description</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Alternate M1 route – ‘Short South’</strong>&lt;br&gt;New road corridor (including tunnels) between Mount Barker and the North-South Corridor at Darlington.</td>
<td>Yes</td>
<td>- Provides a relatively direct route to Adelaide’s Port and Airport (avoids Adelaide Hills bypass)&lt;br&gt;- Optimises existing / planned infrastructure (North-South Corridor)&lt;br&gt;- Utilises existing roads through upgrades</td>
<td>May require significant tunnelling which incurs relatively high capital costs.</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Alternate M1 route – ‘Short North’</strong>&lt;br&gt;New road corridor (including tunnels) between Mount Barker and Grand Junction Road via Hope Valley.</td>
<td>Yes</td>
<td>- Provides a relatively direct route to Adelaide’s Port and Airport (avoids Adelaide Hills bypass)&lt;br&gt;- Optimises existing / planned infrastructure (North-South Corridor)</td>
<td>May require significant tunnelling which incurs relatively high capital costs.</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>ADL access road upgrades</strong>&lt;br&gt;Increase landside freight and passenger connectivity between ADL and the North-South Corridor, including Richmond Road.</td>
<td>Yes</td>
<td>- Optimises existing / planned infrastructure (North-South Corridor)&lt;br&gt;- Potential to improve road freight efficiency to ADL without large capital investment in Greenfield assets</td>
<td>Does not improve the problems and opportunities in the south-east of Adelaide.</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>GlobeLink Reference Rail</strong>&lt;br&gt;New eastern rail bypass of the Adelaide Hills, replacing the existing ARTC track.</td>
<td>Yes</td>
<td>- Bypass of the Adelaide Hills, avoiding the undulating topography which reduces speed and efficiency of rail movements&lt;br&gt;- Improved amenity and safety for residents of the Adelaide Hills</td>
<td>- Increased travel time associated with bypassing the Adelaide Hills&lt;br&gt;- Previous studies have indicated the project is not economically feasible (BCR less than 1)</td>
<td>Yes</td>
</tr>
<tr>
<td>Name &amp; Description</td>
<td>Relevance to the problem &amp; opportunities?</td>
<td>Strengths</td>
<td>Weaknesses</td>
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<tr>
<td><strong>Belair line standard gauge curve easing</strong></td>
<td>Yes</td>
<td>- Ability to improve rail freight efficiency without the additional cost involved with construction of an Adelaide Hills bypass</td>
<td>May not have a large impact on rail speeds as freight still required to traverse steep gradients through the Adelaide Hills.</td>
<td>Yes</td>
</tr>
<tr>
<td>Curve easing of standard gauge line across the Adelaide Hills to reduce noise and increase speeds.</td>
<td></td>
<td>- Improved amenity for residents of the Adelaide Hills</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Regional rail freight and grain site investment</strong></td>
<td>Yes</td>
<td>- Ability to improve connectivity from regional freight generators</td>
<td>Change in mode will only occur if cost and time savings can be achieved through utilising the rail network.</td>
<td>Yes</td>
</tr>
<tr>
<td>Re-open decommissioned regional rail lines and invest to enable higher axle loads and operating speeds. Investment in grain collection sites.</td>
<td></td>
<td>- Upgrades to grain receival sites comparable to those which have been undertaken in other States, improving South Australia’s competitiveness</td>
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<tr>
<td></td>
<td></td>
<td>- Reduced number of heavy vehicles on regional roads</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GlobeLink Reference Airport</strong></td>
<td>Yes</td>
<td>- Improved connectivity for regional airfreight to international markets</td>
<td>- There does not appear to be enough demand forecasted to justify the capital investment associated with a dedicated freight airport</td>
<td>Yes</td>
</tr>
<tr>
<td>New, dedicated freight airport located near Murray Bridge.</td>
<td></td>
<td>- No restrictions on flight times (such as the curfew)</td>
<td>- Inability for passenger services to offset the cost of air transport</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Dedicated freight facilities to improve productivity</td>
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</tr>
<tr>
<td>Name &amp; Description</td>
<td>Relevance to the problem &amp; opportunities?</td>
<td>Strengths</td>
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</tbody>
</table>
| **GlobeLink Reference Intermodal and Export Park**<br>New intermodal terminal and export park at Murray Bridge. This may include:  
- Empty container park  
- Common user cold storage  
- On-dock rail at Outer Harbor  
- Facilities to support a freight village | Yes | - Clustering of warehousing and distribution facilities can provide cost savings for users, however will require enabling policies from Government  
- Improved competitiveness for rail transport to the Port of Adelaide, reducing road congestion on key arterials through the city  
- Positive environmental externalities associated with increased rail mode share | - Volumes of freight passing through a proposed intermodal may be low, due to competition from direct road freight  
- An intermodal terminal alone may not be enough to provide cost savings relative to road. Government will be required to promote integrated warehousing and production at or near terminals to reduce the number of lifts, and pick-up and delivery costs | Yes |
| **Alternate M1 route – ‘South’**<br>New road corridor (including tunnels) between Mount Barker and the North-South Corridor at Murray Bridge. | Yes | - Optimises existing / planned infrastructure (North-South Corridor)  
- Utilises existing roads through upgrades | - May require significant tunnelling which incurs relatively high capital costs  
- Commencing the new route at Murray Bridge means a significant diversion is required | No |
| **Portrush Road widening**<br>Widening Portrush Road to allow for increased volumes of traffic. | Yes | Allows road freight to continue to travel to the Port of Adelaide via a direct route, avoiding the need to bypass the Adelaide Hills, incurring additional time. | - As Portrush Road neighbours residential dwellings, option would require significant compulsory acquisition, meeting opposition from the community  
- Less direct route than other capital options, and poor connection to airport | No |
<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td>Northern Road upgrades</td>
<td>Yes</td>
<td>Improved connectivity for road freight travelling to the Port of Adelaide from the northern regions of South Australia.</td>
<td>No benefit to freight originating from / destined for regions south-east of Adelaide.</td>
<td>No</td>
</tr>
</tbody>
</table>
| Heavy vehicle grade separations               | Yes                                       | - Reduced congestion for commuters and heavy vehicles due to separation of routes  
- Will allow road freight to continue to travel to the Port of Adelaide via a direct route, avoiding the need to to bypass the Adelaide Hills, incurring additional time | - Vertical separation is highly expensive and requires significant interface with existing road corridors within highly residential areas  
- Would be difficult to implement in many of the key freight routes within metropolitan Adelaide, due to the proximity of residential houses to the roads | No                        |
| Level crossing removals                       | Yes                                       | - Avoids costly Greenfield capital works  
- Improved safety on key freight routes | Level crossing removal would have minimal impact on freight efficiency as level crossings do not currently appear to be an issue causing road congestion on key freight routes within Adelaide. | No                        |
| Mount Barker / Murray Bridge passenger rail services | Yes                                       | May reduce congestion through Adelaide Hills by removing the commuter traffic. | - Commuters may not use public transport infrastructure, particularly given Adelaide’s high commuter mode share to road  
- Ability to influence commuter mode choice is uncertain | No                        |

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</thead>
<tbody>
<tr>
<td><strong>Dukes Highway/Western Highway upgrades - Tailem Bend to Stawell</strong>&lt;br&gt;397 km of road upgrades including; extra lanes, town bypasses, upgraded intersections, safety barriers, and protected turning lanes or duplication.</td>
<td>Yes</td>
<td>May improve productivity of road freight between Victoria and South Australia.</td>
<td>No evidence to suggest this section of the road corridor is currently constrained.</td>
<td>No</td>
</tr>
<tr>
<td><strong>Port Wakefield Road duplication</strong>&lt;br&gt;Duplication of Port Wakefield Road to Port Augusta or extending overtaking lanes.</td>
<td>Yes</td>
<td>Improved connectivity for road freight travelling to the Port of Adelaide from the north.</td>
<td>No benefit to freight originating from / destined for the south-east of Adelaide.</td>
<td>No</td>
</tr>
<tr>
<td><strong>Duplication of Riddoch Hwy</strong>&lt;br&gt;Duplication for AVs at Riddoch Hwy (in the south-east) to promote:&lt;br&gt;- Tourism around Mt Gambier&lt;br&gt;- Timber industry</td>
<td>Yes</td>
<td>Improved road access to the Dukes Highway from Mount Gambier region.</td>
<td>- Road freight still required to traverse the Adelaide Hills and mix with commuter traffic on the arterial road network to reach the Port of Adelaide&lt;br&gt;- Benefits limited to industries located in the Mount Gambier region, and does not improve problem and opportunities for the rest of the south east</td>
<td>No</td>
</tr>
<tr>
<td><strong>Arterial road noise barriers</strong>&lt;br&gt;Build noise barriers to reduce noise pollution in residential areas.</td>
<td>Yes</td>
<td>Improved amenity for residents located in close proximity to key arterials.</td>
<td>- Only addresses one problem statement, limiting the potential benefits of this option&lt;br&gt;- May receive opposition from residents regarding visual amenity of the noise barriers</td>
<td>No</td>
</tr>
<tr>
<td><strong>Kangaroo Island road connection</strong>&lt;br&gt;Tunnel to Kangaroo Island.</td>
<td>Yes</td>
<td>Improved efficiency for freight movements to/from Kangaroo Island.</td>
<td>- Very high capital cost associated with construction of a submerged tunnel&lt;br&gt;- Relatively small number of freight movements to / from Kangaroo Island</td>
<td>No</td>
</tr>
<tr>
<td>Name &amp; Description</td>
<td>Relevance to the problem &amp; opportunities?</td>
<td>Strengths</td>
<td>Weaknesses</td>
<td>Progress to Review stage 2</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>--------------------------</td>
</tr>
</tbody>
</table>
| **Seal Strezleki Track**               | Yes                                      | - Improved road connectivity for resources in the outback region of North-East South Australia  
- May improve outback tourism                                                             | Only addresses industries located in the north east of South Australia.                         | No                       |
| **Crystal Brook to Broken Hill rail upgrades** | Yes                                      | Improved efficiency for rail freight travelling between NSW and South Australia. | There is no evidence to suggest this section of the corridor is currently constrained.           | No                       |
| **Tottenham to Keswick passing loop extensions** | Yes                                      | Facilitates increased train frequency creating additional capacity on the Melbourne-Adelaide rail corridor. | Rail corridor does not appear to have capacity constraints to increased frequency.             | No                       |
| **Tottenham to Keswick double stacking upgrades** | Yes                                      | - Potential efficiency improvements associated with alleviating dwell time at Dry Creek, double stack to Perth / single stack to continue on to Melbourne  
- Double stacked trains could potentially produce savings of up to 25 per cent for rail customers | - While ARTC has advised that although there is a long-term aspiration to enable double-stacking Melbourne-Perth, there isn’t enough volume on the corridor (current or forecasted) to justify any infrastructure intervention  
- Requires investigation and investment by the Victorian Government | No                       |
| **Eyre Peninsula rail network standardisation** | Yes                                      | - Reduced number of heavy vehicles using the road network  
- Improved rail efficiency for movements to/from the Eyre Peninsula | No benefit to the freight originating from / travelling through the south-east of Adelaide.     | No                       |
<table>
<thead>
<tr>
<th>Name &amp; Description</th>
<th>Relevance to the problem &amp; opportunities?</th>
<th>Strengths</th>
<th>Weaknesses</th>
<th>Progress to Review stage 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monarto to Darwin Rail service</td>
<td>Yes</td>
<td>Improved accessibility to export markets in the North.</td>
<td>No evidence to suggest there is enough demand to justify a dedicated rail service.</td>
<td>No</td>
</tr>
</tbody>
</table>
| Mount Gambier to Heywood line gauge standardisation | Yes                                       | - Support rail transport for timber being sent to the Port of Portland from the 'Green Triangle Region'  
- Positive externalities associated with increased rail mode share                                                                 | Requires collaboration between Victorian and SA Governments.                                                                       | No                        |
| Mildura to Broken Hill line              | Yes                                       | Facilitate the movement of resources near Broken Hill through the Port of Portland.                  | No benefit to the freight originating from / destined for the south-east of Adelaide  
- Requires investigation and investment by other states                                                                              | No                        |
| New bogies on rail line to reduce wheel squeal | Yes                                       | Improved amenity for residents in the Adelaide Hills                                               | Only addresses one problem statement, limiting the potential benefits of this option  
- May reduce the load capacity of freight trains                                                                                     | No                        |
<p>| Outer Harbour channel and berth upgrades  | Yes                                       | Enable larger ship calls at Port of Adelaide                                                      | Adverse environmental impacts associated with dredging.                                                                             | No                        |
| Deep Sea Port                            | Yes                                       | Enable larger ship calls at Port of Adelaide                                                      | Currently, there does not appear to be any capacity issue at the Port of Adelaide justifying the need for significantly larger ship calls. | No                        |</p>
<table>
<thead>
<tr>
<th>Name &amp; Description</th>
<th>Relevance to the problem &amp; opportunities?</th>
<th>Strengths</th>
<th>Weaknesses</th>
<th>Progress to Review stage 2</th>
</tr>
</thead>
</table>
| **Drone airport**                      | Yes                                      | - Potential cost benefits associated with utilising drones to replace the courier network  
- Reduced freight congestion on roads  
- Positive environmental externalities associated with reducing road transport for the courier network | - Negative amenity benefits have been reported on current drone trails relating to aircraft noise  
- Would require private sector investment in commercial drone operations  
- Drone technology for cargo is currently not advanced enough to require a standalone airport | No                                                                         |
| **Support ADL East**                   | Yes                                      | Promotes the efficiency benefits associated with clustering.                                                                                                                                               | Unclear if there is enough volume to sustain a precinct located near the airport.                                                                                                                                                                                       | No                                                                         |
| **Compulsory acquisition of flight paths** | Yes                                      | Improved flexibility for air freight, which will be able to operate without a curfew.                                                                                                                      | Would require significant compulsory acquisition, meeting community opposition.                                                                                                                                                                                        | No                                                                         |
| **Relocate ADL**                       | Yes                                      | - Reduced congestion in metropolitan Adelaide  
- Improved efficiency for air freight travelling from the south-east  
- Amenity benefit for residents currently residing in the Adelaide Airport flight path | - Large capital investment to duplicate an airport that does not currently appear to have capacity constraints  
- Longer travel times for passengers travelling to Adelaide upon landing  
- Large investment made in existing airport infrastructure would be made redundant | No                                                                         |
## Appendix B.  Stage 2 review results

### Non-capital strategic options

**Table 29 Review of non-capital MCA results**

<table>
<thead>
<tr>
<th>More flights, more freight</th>
<th>Rating</th>
<th>Comments</th>
</tr>
</thead>
</table>
| **1 State & National Productivity** | 2 | - As the vast majority of air freight exported through Adelaide is carried on passenger aircraft, there is potential for an increase in export volumes, similar to the addition of new passenger services to United Arab Emirates and Qatar that occurred in 2015-16  
- Increased productivity at ADL through improved ground handling equipment and extended DAFF operating hours  
- Increased freight connectivity with more business centres across the world |
| **2 New Employment & Investment** | 1 | Increased flight paths would generate some additional employment at ADL and encourage further investment by the private sector to meet demand of new export destinations |
| **3 Safety, Amenity & Social Benefits** | 0 | No discernable impact for this criterion |
| **4 Collaboration, Partnership & Innovation** | 2 | - Collaboration between Government departments through alignment with Tourism SA  
- Partnership with airlines through air service revenue guarantees |
| **5 Optimise Existing Infrastructure** | 1 | Potential for increased flight paths through ADL, creating additional freight export capacity to new destinations |

**Recommended to progress**  
YES  
- Initiative proceeds for further investigation within GlobeLink Scoping Study  
- Package ‘ADL road access upgrades’ into this option.
### Modernise transport regulation

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Rating</th>
<th>Comments</th>
</tr>
</thead>
</table>
| State & National Productivity    | 2      | - Potential to save on ‘last mile’ consumer / retail delivery costs and introduce new delivery products  
- Encourages the enablement of freight service innovation, which has the potential to provide increased efficiency relative to existing transport network |
| New Employment & Investment      | 1      | A supportive regulatory environment attracts investment and employment in new industries. For example, a ‘air taxi’ passenger drone under development by Cora, relocated development and testing operations to New Zealand after developing the drone in the USA, citing the forward thinking regulatory environment |
| Safety, Amenity & Social Benefits| 1      | - New transport technology may have significant positive environmental impacts e.g. reduced carbon emissions from drone deliveries relative to courier  
- Freight service innovation may also lead to reduced congestion on the arterial road network, providing amenity improvements for residents  
- However there is also potential negative safety and amenity impacts associated with new technologies such as automated vehicles (e.g. technology failures leading to crashes) and drones (e.g. noise impacting amenity of residents) |
| Collaboration, Partnership & Innovation | 2 | Modernised regulatory environment may encourage investment in innovative freight transport technologies by the private sector |
| Optimise Existing Infrastructure  | 2      | Investment may be required in ‘over the horizon’ infrastructure to support new and emerging modes |

**Recommended to progress**

**NO**

Complementary initiative - Recommend DPTI pursue as a complementary initiative.
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Rating</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 State &amp; National Productivity</td>
<td>1</td>
<td>- Heavy vehicle road pricing can improve transport efficiency in terms of optimising fleet utilisation, spreading truck traffic into off-peak periods</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Revenue raised from industry can be deployed to new and/or upgraded transport infrastructure, which will may improve the efficiency of the road network</td>
</tr>
<tr>
<td>2 New Employment &amp; Investment</td>
<td>1</td>
<td>- Road pricing may generate a small increase in investment and employment through re-allocation of transport cost savings achieved through improved efficiency of the road network,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Will generate revenue for Government investment in transport infrastructure</td>
</tr>
<tr>
<td>3 Safety, Amenity &amp; Social Benefits</td>
<td>1</td>
<td>- Road pricing can incentivise mode shift to rail, leading to positive environmental externalities from reduced vehicle use</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Road pricing may spread heavy vehicles into off-peak periods, providing reduced congestion for residents</td>
</tr>
<tr>
<td>4 Collaboration, Partnership &amp; Innovation</td>
<td>0</td>
<td>No discernable impact for this criterion</td>
</tr>
<tr>
<td>5 Optimise Existing Infrastructure</td>
<td>3</td>
<td>Optimises use of the existing road network through spreading truck traffic into off-peak period and pricing road externalities</td>
</tr>
<tr>
<td>Recommended to progress</td>
<td>NO</td>
<td>Complementary initiative - Currently being pursued as a separate Commonwealth process</td>
</tr>
</tbody>
</table>
## Road network operational reforms

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Rating</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 State &amp; National Productivity</td>
<td>1</td>
<td>Potential to provide de-congestion benefits through signalling, increased lane use and priority heavy vehicle lanes, improving the efficiency of heavy vehicle movements</td>
</tr>
<tr>
<td>2 New Employment &amp; Investment</td>
<td>0</td>
<td>Option would not be expected to generate large enough transport savings for re-investment to make a discernable impact for this criterion</td>
</tr>
<tr>
<td>3 Safety, Amenity &amp; Social Benefits</td>
<td>1</td>
<td>Reduced congestion on roads would provide an amenity benefit to residents</td>
</tr>
<tr>
<td>4 Collaboration, Partnership &amp; Innovation</td>
<td>0</td>
<td>No discernable impact for this criterion</td>
</tr>
<tr>
<td>5 Optimise Existing Infrastructure</td>
<td>1</td>
<td>Facilitates improved efficiency on the existing road network without capital expenditure on new roads</td>
</tr>
</tbody>
</table>

**Recommended to progress**: NO

Complementary initiative - Recommend DPTI pursue as a complementary initiative
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Rating</th>
<th>Comments</th>
</tr>
</thead>
</table>
| 1 State & National Productivity              | 2      | Potential for step changes in productivity to be achieved through use of larger HPVs on key freight routes such as the South Eastern Freeway  
- Supply chain consultations with transport companies revealed the restriction on larger vehicle combinations between Adelaide and Murray Bridge is a constraint in their supply chains, with vehicles larger than a B-Double required to either transition to permissible B-Doubles or divert by some 197 kilometres. There is potential to alleviate this constraint through a review. |
| 2 New Employment & Investment                | 1      | May generate a small increase in investment and employment through re-allocation of transport cost savings achieved through larger HPV use, however expected to be relatively minor                                                                                                                                                                                                                                                                                                                                                 |
| 3 Safety, Amenity & Social Benefits          | 1      |  
- HPVs lead to fewer truck trips per freight task, which generates positive environmental externalities through reduced emissions  
- However, there may be potential for negative safety impacts associated with larger heavy vehicles or relaxed speed limits on the South Eastern Freeway, particularly the steep 7km decent into the city |
| 4 Collaboration, Partnership & Innovation    | 0      | No discernable impact for this criterion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 5 Optimise Existing Infrastructure           | 1      | May improve efficiency on existing road network through use of larger heavy vehicles, requiring few truck tricks to service the freight task                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| **Recommended to progress**                  | NO     | Complementary initiative - Recommend DPTI pursue as a complementary initiative                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
# Increase public transport use

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Rating</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 State &amp; National Productivity</td>
<td>1</td>
<td>Increased uptake of public transport could provide improved freight efficiency through de-congestion of the road network, however this impact is not be expected large given Adelaide’s high commuter mode share to road.</td>
</tr>
<tr>
<td>2 New Employment &amp; Investment</td>
<td>0</td>
<td>No discernable impact for this criterion</td>
</tr>
<tr>
<td>3 Safety, Amenity &amp; Social Benefits</td>
<td>1</td>
<td>Positive environmental externalities relative to commuters travelling via the road network, however increased commuter take up may be small, particularly given Adelaide’s high commuter mode share to road</td>
</tr>
<tr>
<td>4 Collaboration, Partnership &amp; Innovation</td>
<td>0</td>
<td>No discernable impact for this criterion</td>
</tr>
<tr>
<td>5 Optimise Existing Infrastructure</td>
<td>1</td>
<td>May increase take up of existing public transport infrastructure by commuters</td>
</tr>
</tbody>
</table>

**Recommended to progress**  
NO  
Complementary initiative - Recommend SAPTA pursue as part of their mandate to increase service quality and performance.
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Rating</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 State &amp; National Productivity</td>
<td>0</td>
<td>Connectivity, flexibility and increased time associated with rail movements would provide a decrease in freight efficiency if increased rail uptake occurred on the existing network.</td>
</tr>
<tr>
<td>2 New Employment &amp; Investment</td>
<td>1</td>
<td>A modal shift from rail to road may negatively impact employment, given road transport typically requires higher levels of employment to serve a comparable freight task.</td>
</tr>
</tbody>
</table>
| 3 Safety, Amenity & Social Benefits | 0     | Positive environmental externalities associated with increased rail use relative to road
|                                  |        | Rail movements through residential areas (such as the Adelaide Hills) creates negative amenity impacts for residents, similar to road transport |
| 4 Collaboration, Partnership & Innovation | 0   | No discernable impact for this criterion |
| 5 Optmise Existing Infrastructure | 1     | Increased use of existing rail freight transport infrastructure through incentivisation scheme |

**Recommended to progress**

NO

Scored 0 or below
## Protect future lands and corridors

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Rating</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 State &amp; National Productivity</td>
<td>🍂</td>
<td>Protection of the corridor may have cost savings in the future in respect of land acquisition costs, however - in the short-to-medium term the land is restricted from productive use.</td>
</tr>
<tr>
<td>2 New Employment &amp; Investment</td>
<td>🌊</td>
<td>No discernable impact for this criterion</td>
</tr>
<tr>
<td>3 Safety, Amenity &amp; Social Benefits</td>
<td>🍂</td>
<td>Compulsory acquisition of land as part of corridor preservation activities will provide a negative amenity impact to the affected residents and communities</td>
</tr>
<tr>
<td>4 Collaboration, Partnership &amp; Innovation</td>
<td>🌊</td>
<td>No discernable impact for this criterion</td>
</tr>
<tr>
<td>5 Optimise Existing Infrastructure</td>
<td>🌊</td>
<td>No discernable impact for this criterion</td>
</tr>
</tbody>
</table>

**Recommended to progress**

|                | NO     | Scored 0 or below            |

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Document Classification: KPMG Public
## ADL flexibility initiatives

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Rating</th>
<th>Comments</th>
</tr>
</thead>
</table>
| 1 State & National Productivity   | 1      | - Curfew extension may facilitate a small increase in passenger flights, which can be used for freight exports  
- As flexibility has not been identified as a significant constraint, the initiatives would not be expected to have a large impact for this criterion  
- Flights to potential growth markets would not require flights to leave outside of the existing curfew, therefore any increase in flight paths would be expected to be minimal |
| 2 New Employment & Investment     | 0      | No discernable impact for this criterion |
| 3 Safety, Amenity & Social Benefits | 3    | A relaxed curfew would negatively impact amenity for surrounding residents as ADL is located adjacent to highly residential areas |
| 4 Collaboration, Partnership & Innovation | 0 | No discernable impact for this criterion |
| 5 Optimise Existing Infrastructure | 0 | Flexibility initiatives would be expected to make a negligible difference to increased services at ADL, as is the curfew is not currently a constraint |

**Recommended to progress**  
**NO**  
Scored 0 or below
## Capital strategic options

### Table 30 Review of non-capital MCA results

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Rating</th>
<th>Comments</th>
</tr>
</thead>
</table>
| 1 State & National Productivity                    | 2      | – Centralised freight hub and co-location around the hub could reduce supply chain costs  
|                                                    |        | – However, preliminary studies indicate modal shift to rail may be limited and co-location will be customer driven and need private sector buy in |
| 2 New Employment & Investment                      | 3      | – Concentration of freight services around an intermodal could attract customers to locate to reduce pick-up and delivery costs  
|                                                    |        | – Reduced supply chain costs, achieved by sharing of freight facilities and costs, may support smaller businesses and attract investment |
| 3 Safety, Amenity & Social Benefits                | 1      | – Co-location of freight services may remove freight operations away from residential areas, improving amenity for those residents |
| 4 Collaboration, Partnership & Innovation          | 3      | – Close proximity of industries around centralised freight hub may stimulate innovation and collaboration  
|                                                    |        | – Potential for government and public sector partnerships for common use facilities e.g. cold storage |
| 5 Optimise Existing Infrastructure                 | 1      | – Co-location and consolidation may promote more efficient movements along the existing transport network |

**Recommended to progress**

**YES**

– Initiative proceeds for further investigation within GlobeLink Scoping Study.
## Cross Road tunnel - M1 to North-South Corridor

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Rating</th>
<th>Comments</th>
</tr>
</thead>
</table>
| **1 State & National Productivity**           | 3      | - Provides a direct route from the M1 to the Port of Adelaide with reduced intersections and avoids the need to undertake a northern or southern bypass  
- Reduces congestion on key arterials such as Portrush road  
- Pending further work on potential alignments; the tunnel entrance would be expected to avoid the last 7kms of the South Eastern Freeway, allowing heavy vehicles to avoid the 60 km/h speed limit and low gear requirement on this section of the road network. |
| **2 New Employment & Investment**             | 1      | - Reduces supply chain costs, thereby improving profitability for business; reduced costs could be passed on to employees or create new jobs.  
- Increases attractiveness for private investment |
| **3 Safety, Amenity & Social Benefits**       | 3      | - Heavy vehicles completely separated from general traffic, returning Cross Road and Portrush Road to commuters  
- Opportunity to improve housing access and other social infrastructure around Cross Road and Portrush Road |
| **4 Collaboration, Partnership & Innovation** | 0      | - No discernable impact for this criterion |
| **5 Optimise Existing Infrastructure**        | 1      | - Works will alleviate pressure on Portrush Road  
- Enhanced utilisation of North-South corridor by moving HPVs via Cross Road will leverage existing upgrades |
| **Recommended to progress**                   | **YES**| - Initiative proceeds for further investigation within GlobeLink Scoping Study. |
## Cross Road & South Eastern Freeway upgrades

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Rating</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 State &amp; National Productivity</td>
<td>1</td>
<td>- Provides a more direct route from M1 to the Port of Adelaide, avoiding a northern or southern bypass&lt;br&gt;- Reduces congestion on key arterials such as Portrush road, however will increase congestion on Cross road&lt;br&gt;- Scale of improvement on transport task will be slight</td>
</tr>
<tr>
<td>2 New Employment &amp; Investment</td>
<td>1</td>
<td>- Reduces supply chain costs, thereby improving profitability for business; reduced costs could be passed on to employees or create new jobs.&lt;br&gt;- Increases attractiveness for private investment</td>
</tr>
<tr>
<td>3 Safety, Amenity &amp; Social Benefits</td>
<td>1</td>
<td>- Will increase freight volumes along Cross road, negatively impacting liveability of local residents&lt;br&gt;- However, will divert heavy vehicles to North-South Corridor, generally improving amenity for residents along existing key freight arterial roads</td>
</tr>
<tr>
<td>4 Collaboration, Partnership &amp; Innovation</td>
<td>0</td>
<td>- No discernable impact for this criterion</td>
</tr>
<tr>
<td>5 Optimise Existing Infrastructure</td>
<td>3</td>
<td>- Works will upgrade the existing road and intersections along Cross road and alleviate pressure on Portrush road&lt;br&gt;- Enhanced utilisation of North-South corridor by moving HPVs via Cross road will leverage off the existing upgrades</td>
</tr>
</tbody>
</table>

**Recommended to progress**: YES - Initiative proceeds for further investigation within GlobeLink Scoping Study.
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Rating</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 State &amp; National Productivity</td>
<td>1</td>
<td>Previous study by Tonkin Consulting indicated that benefits of the corridor equate to $2.7bn</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Transport benefits (productivity improvements and time savings) amounted to $654m in the study</td>
</tr>
<tr>
<td>2 New Employment &amp; Investment</td>
<td>0</td>
<td>No discernable impact for this criterion if the northern rail bypass was constructed on its own</td>
</tr>
<tr>
<td></td>
<td></td>
<td>However, if the Victorian section of the Melbourne-Adelaide corridor was upgraded to facilitate double stacking, this option may have a negative</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Impact on employment in the South Australia as services bypass Adelaide when moving freight between East and West capital cities (no longer a requirement to dwell and double stack)</td>
</tr>
<tr>
<td>3 Safety, Amenity &amp; Social Benefits</td>
<td>3</td>
<td>New corridor would avoid high density areas</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Less noise for residents in the Adelaide Hills</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Avoids steep terrain and reserves, mitigating bushfire risk</td>
</tr>
<tr>
<td>4 Collaboration, Partnership &amp; Innovation</td>
<td>0</td>
<td>No discernable impact for this criterion</td>
</tr>
<tr>
<td>5 Optimise Existing Infrastructure</td>
<td>2</td>
<td>This option would require construction of a completely new rail line bypassing the Adelaide Hills</td>
</tr>
</tbody>
</table>

**Recommended to progress**  YES – Initiative proceeds for further investigation within GlobeLink Scoping Study.
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Rating</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 State &amp; National Productivity</td>
<td>1</td>
<td>- Requires a significant deviation to the north of the Adelaide Hills, increasing travel time to the Port of Adelaide by about one hour.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Associated benefit from B-triple access is not large enough to compensate for cost of the additional distance travelled (additional 90kms to Port)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Potential benefit if BAB Quads (4 TEU carrying capacity) were widely adopted by industry, even so there is more direct routes which could provide a larger benefit using these vehicles</td>
</tr>
<tr>
<td>2 New Employment &amp; Investment</td>
<td>1</td>
<td>- Potential complementary development along the route, providing growth opportunities</td>
</tr>
<tr>
<td>3 Safety, Amenity &amp; Social Benefits</td>
<td>3</td>
<td>- Reduces freight traffic moving along urban roads (e.g. Portrush and Cross road)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Avoids the most hazardous sections of the South Eastern Freeway and uses latest road safety design</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Reduces traffic mixing and stop/start movements</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- New route would not be expected to pass through highly residential areas</td>
</tr>
<tr>
<td>4 Collaboration, Partnership &amp; Innovation</td>
<td>0</td>
<td>- No discernable impact for this criterion</td>
</tr>
<tr>
<td>5 Optimise Existing Infrastructure</td>
<td>1</td>
<td>- The bypass from Murray Bridge to Truro will include construction of new road, as well as some upgrade of existing roads</td>
</tr>
<tr>
<td>Recommended to progress</td>
<td>YES</td>
<td>- Initiative proceeds for further investigation within GlobeLink Scoping Study.</td>
</tr>
</tbody>
</table>
## Alternate M1 route – ‘Short North’

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Rating</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 State &amp; National Productivity</td>
<td>2</td>
<td>- More direct route from M1 to Grand Junction and the Port of Adelaide, avoiding congested intersections</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Avoids speed and size restrictions along the SE highway</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Improved connectivity for industries in North Adelaide</td>
</tr>
<tr>
<td>2 New Employment &amp; Investment</td>
<td>1</td>
<td>- Reduces supply chain costs, thereby improving profitability for business; reduced costs could be passed on to employees or create new jobs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Increases attractiveness for private investment</td>
</tr>
<tr>
<td>3 Safety, Amenity &amp; Social Benefits</td>
<td>0</td>
<td>- Improves amenity and social impacts of freight along key urban roads (e.g. Portrush and Cross road)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- However, will negatively impact residents along the route, such as small towns</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Overall, creates a shift of the amenity disbenefit from residents along existing arterials to residents along the new route; balancing out to a neutral score</td>
</tr>
<tr>
<td>4 Collaboration, Partnership &amp; Innovation</td>
<td>0</td>
<td>- No discernable impact for this criterion</td>
</tr>
<tr>
<td>5 Optimise Existing Infrastructure</td>
<td>1</td>
<td>- Route will require significant construction of new road</td>
</tr>
</tbody>
</table>

**Recommended to progress** YES

- Initiative proceeds for further investigation within GlobeLink Scoping Study.
## Alternate M1 route – ‘Short South’

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Rating</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 State &amp; National Productivity</td>
<td>🟢</td>
<td>- Provides a direct route from M1 to the Port of Adelaide via North-South Corridor, bypassing congesting arterials through the city</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- However, traverses South Adelaide urban areas and is a slightly longer route than the existing road network to the Port of Adelaide</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Enhanced freight connectivity for industrial areas in South Adelaide</td>
</tr>
<tr>
<td>2 New Employment &amp; Investment</td>
<td>🟢</td>
<td>- Reduces supply chain costs, thereby improving profitability for business; reduced costs could be passed on to employees or create new jobs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Increases attractiveness for private investment</td>
</tr>
<tr>
<td>3 Safety, Amenity &amp; Social Benefits</td>
<td>🟠</td>
<td>- Improves amenity and social impacts of freight along key urban roads (e.g. Portrush and Cross road)</td>
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<td>- However, will negatively impact residents along the route, such as small towns</td>
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<td>- Overall, creates a shift of the amenity disbenefit from residents along existing arterials to residents along the new route; balancing out to a neutral score</td>
</tr>
<tr>
<td>4 Collaboration, Partnership &amp; Innovation</td>
<td>🟠</td>
<td>- No discernable impact for this criterion</td>
</tr>
<tr>
<td>5 Optimise Existing Infrastructure</td>
<td>🟠</td>
<td>- Will require significant construction of new road</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- However, utilises the current upgrades at North-South Corridor</td>
</tr>
<tr>
<td>Recommended to progress</td>
<td>YES</td>
<td>- Initiative proceeds for further investigation within GlobeLink Scoping Study.</td>
</tr>
</tbody>
</table>
## ADL access road upgrades

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Rating</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 State &amp; National Productivity</td>
<td>1</td>
<td>May provide some efficiency benefit on the road network in/out of ADL, however this may not be large given this section of the network has not been identified as a significant constraint on the supply chain</td>
</tr>
<tr>
<td>2 New Employment &amp; Investment</td>
<td>1</td>
<td>Improved connectivity for heavy vehicles moving to/from the freight hub at ADL, which may provide some incentive for further investment by the private sector</td>
</tr>
<tr>
<td>3 Safety, Amenity &amp; Social Benefits</td>
<td>1</td>
<td>Improve amenity for nearby residents through reduced congestion surrounding ADL</td>
</tr>
<tr>
<td>4 Collaboration, Partnership &amp; Innovation</td>
<td>0</td>
<td>No discernable impact for this criterion</td>
</tr>
<tr>
<td>5 Optimise Existing Infrastructure</td>
<td>3</td>
<td>Involves upgrades to existing roads, facilitating improved connectivity with planned infrastructure (North-South Corridor)</td>
</tr>
</tbody>
</table>

**Recommended to progress**: YES  
- Initiative proceeds for further investigation within GlobeLink Scoping Study.  
- Packaged into ‘Air freight demand facilitation’ option
## Belair line standard gauge curve easing

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>1 State &amp; National Productivity</td>
<td>0</td>
<td>May provide a small impact to the speed of rail movements through the Adelaide Hills, however this is expected to be negligible</td>
</tr>
<tr>
<td>2 New Employment &amp; Investment</td>
<td>0</td>
<td>No discernable impact for this criterion</td>
</tr>
<tr>
<td>3 Safety, Amenity &amp; Social Benefits</td>
<td>1</td>
<td>Reduced noise pollution from trains due to wheel squeal on tight curves through the Hills</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reduced bushfire risk from wheel sparks</td>
</tr>
<tr>
<td>4 Collaboration, Partnership &amp; Innovation</td>
<td>0</td>
<td>No discernable impact for this criterion</td>
</tr>
<tr>
<td>5 Optimise Existing Infrastructure</td>
<td>1</td>
<td>Upgrades undertaken would be focussed solely on the existing rail infrastructure to improve the standard gauge traversing the Adelaide Hills</td>
</tr>
</tbody>
</table>

**Recommended to progress**

**NO**

- No significant impact outside of safety and amenity (which is only slightly positive), does not justify shortlisting.
### Regional rail freight and grain site investment

<table>
<thead>
<tr>
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<th>Comments</th>
</tr>
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</table>
| **1 State & National Productivity**| 2      | - Potential benefit for efficiency from higher axle load limits and faster operating speeds  
- However, there is currently a lack of demand for, with minimal growth expected  
- Currently, the market prefers trucking grain to Tailem Bend for consolidation before being sent to Port of Adelaide via rail due to the cost and flexibility advantages associated with the volumes.  
- Likely to be a negative impact on productivity given re-opening the regional rail network requires large volumes to be more efficient than current transportation methods. |
| **2 New Employment & Investment**  | 0      | - No discernable impact for this criterion                                                                                               |
| **3 Safety, Amenity & Social Benefits** | 1      | - A modal shift to rail could provide positive environmental externalities relative to road- Could provide reduced heavy vehicle movements through the regional road network |
| **4 Collaboration, Partnership & Innovation** | 1      | - Potential for co-location in around grain receival sites and partnerships with the private sector to upgrade sites (e.g. Grain Corp and NSW Government co-investing in Barren Junction for $4.7m upgrade) |
| **5 Optimise Existing Infrastructure** | 0      | - Investment in regional rail network would not be expected to generate large mode shift over current industry preference for trucking to Tailem Bend, therefore may not be 'optimising' the regional rail network through upgrading |

**Recommended to progress** | NO | Scored 0 or below |
<table>
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</thead>
</table>
| State & National Productivity | 2      | - No indication of constraints on capacity of freight movements at ADL in short or medium term  
|                              |        | - Unable to offset costs through mixing of passenger and freight, which will lead to cost increases  
|                              |        | - Stakeholders estimated that costs per kg to export would increase from $1/kg to $5/kg as there wouldn’t be sufficient inbound freight to pay for the return journey  |
| New Employment & Investment  | 1      | - Potential for job creation with specialised services required at freight airport  |
| Safety, Amenity & Social Benefits | 1 | - Significant local environment impact on the areas surrounding the airport  
|                              |        | - Noise, light and emission pollution to areas around the airport  
|                              |        | - Land acquisition required  |
| Collaboration, Partnership & Innovation | 1 | - Potential for co-location of industries and services around the airport  |
| Optimise Existing Infrastructure | 2 | - Existing airport’s capacity would be unused  
|                              |        | - Duplication of infrastructure that does not have capacity constraints  |
| Recommended to progress      | NO     | - Scored 0 or below  |
Contact us

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Director
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