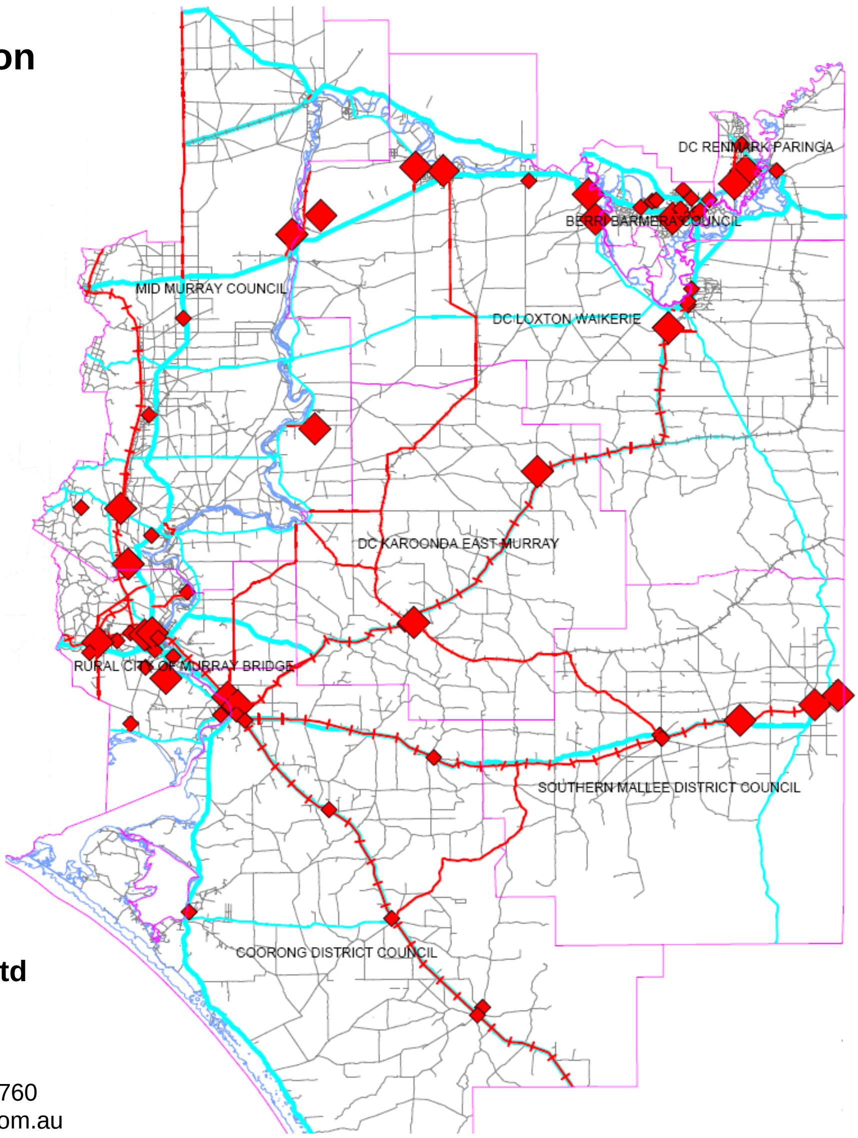
Murraylands and Riverland LGA / RDA Murraylands & Riverland Inc

INQUIRY INTO NATIONAL FREIGHT AND SUPPLY CHAIN PRIORITIES

Joint Submission



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REFERENCES

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2. M&MLGA 2030 Regional Transport Plan – Final Report, HDS Australia, March 2014
3. M&MLGA 2030 Regional Transport Plan – Regional Routes (as at 1 April 2014)
4. MRLGA Updated Regional Road Action Plans and 2017 SLRP Roads Database Update – Final Report, HDS Australia, June 2017
5. MRLGA Regional Roads Freight Movement Study – Draft Report, Tonkin Consulting, July 2017
6. Safety Benefit Analysis of Australian Higher Productivity Vehicles – Findings from Austroads Project FS1805, Kim Hassall, Industrial Logistics Institute / NTARC, September 2014
7. Coorong District Council Network Level Heavy Vehicle Route Assessment and Risk Analysis – Final Report, HDS Australia, June 2017

Note – References 2, 3 and 4 are downloadable from the MRLGA web site at www.mmlga.sa.gov.au under Corporate\Reports. Reference 5 is available to the DIRD Inquiry Review Team (but is not yet a publicly available document) upon email request to Peter Bond, CEO MRLGA at ceomrlga@outlook.com. Reference 6 is downloadable from the Department of Infrastructure and Regional Development web site at https://infrastructure.gov.au/roads/safety/nrsf/2014/files/Session_3_Kim_Hassall.pdf. Reference 7 is available upon email request to Coorong District Council, Attention David Mosel.

1.0 INTRODUCTION

1.1 The Respondents

1.1.1 Murraylands and Riverland Local Government Association

The Murraylands and Riverland Local Government Association (MRLGA) is the trading name of the Murray and Mallee Local Government Association, which is a Regional Association of Councils under Part 4 of the Constitution of the Local Government Association of South Australia. The MRLGA is now constituted as a Regional Subsidiary under Section 43 and Schedule 2 of the Local Government Act 1999, and comprises the following eight member councils:

Berri Barmera Council
Coorong District Council
District Council of Karoonda East Murray
District Council of Loxton Waikerie
Mid Murray Council
The Rural City of Murray Bridge
District Council of Renmark Paringa
Southern Mallee District Council

The above local government authorities are individually responsible for the management and upkeep of their respective local road network. Limited funds for road construction and maintenance come from council rates collected annually, balanced by competing priorities for the expenditure of these council funds. The bulk of funds for road infrastructure are derived from annual federal assistance grants (not tied to specific projects) and from federal and state government grants tied to specific projects.

With regards to regional freight movement, priority issues for the above authorities are:

(1) **Regulation** of heavy vehicle movement within and through their respective council areas; and

(2) Maintaining and upgrading freight transport **infrastructure** to achieve a “fit for purpose” standard for all users of the road and (where appropriate) rail network.

Note that freight movement by air is limited within the region (and likely to remain so in the next 20 years – with a regional freight airport only proposed in the longer term of 25+ years). Sea freight is not of direct relevance to the eight MRLGA councils, as the region is land locked. However, bridge and ferry crossings of the River Murray present significant limitations on current and future freight movement within the region, affecting future **productivity**.

1.1.2 Regional Development Australia Murraylands and Riverland Inc

RDA Murraylands and Riverland Inc (RDAMR) was formed in February 2010 as an amalgamation of the former Murraylands Regional Development Board (MRDB) and Riverland Development Corporation (RDC). The vision of the RDAMR committee is for:

> "a vibrant, resilient region that capitalises on change, embraces economic development and prosperity, and provides an inspirational living, investment and working environment".

RDAMR is a not for profit organisation that acts as a conduit between all levels of government and the Murraylands & Riverland community to optimise the economic future of the region. Its role is to facilitate the efforts of all levels of government and the Murraylands & Riverland business and residential communities to maximise the economic opportunities for the region.

RDAMR has set a long term vision for the region that encapsulates the economic and social goals it believes will best serve the region.

With regards to regional freight movement, priority issues for the RDAMR are:

(1) Improving the **productivity** of regional freight movements to ensure that regional producers and manufacturers are not hampered in their ability to be competitive in Australian and global markets by high freight costs; and

(2) Providing appropriate **infrastructure** (transport, energy, land, people) and suitable planning **regulation**, to attract new industries to the region and to grow existing industries.

1.2 The Region

The Murraylands and Riverland Region (the Region) is located in the Murraylands Statistical Region in eastern South Australia and is dissected by the River Murray. It covers an area of 53,938 km^2, from the Riverland in the north, agriculture areas in the central, west, south and east along the Victorian border, and south westerly to the coast and lakes. Rural based communities throughout the area share a common interest in agriculture/horticulture, with towns primarily servicing the farming and horticultural communities and supporting a growing tourism sector.

The Region has a population base of 68,953 according to the Australian Bureau of Statistics 2016 Census of Population and Housing (approx. 4.0% of the state population). The population has decreased by 1,818 (2.6%) since the 2011 census. Median age of the population ranges from 39.1 in the Rural City of Murray Bridge to 50.0 in Mid Murray Council.

Recent research regarding the annual production value of 14 commodity groups within the Region indicates a total economic contribution of between $ 1.5 billion and $ 1.65 billion depending on seasonal productivity. Additional economic value is generated by numerous meat, grape and other agricultural product processing facilities within the Region.

The River Murray, and its associated wetlands and wildlife, Lake Bonney and a number of National/Conservation Parks, support a range of rare and endangered plant and animal species, and are major tourist attractions throughout parts of the Region. The river travels from the north of the Region, passing through or adjacent to seven of the eight MRLGA councils, before flowing into Lake Alexandrina in the south. It supports a number of tourist and recreation activities, with several tourism vessels operating from centres along the river.

Towards the coast, the Coorong National Park, Lake Alexandrina and the shores of Lake Albert are all well known tourist attractions, particularly for recreational boating and fishing.

The regional town of Murray Bridge provides regional services to the lower parts of the Region and supports both an industrial and commercial base. A smaller industrial/commercial base operates collectively from the Riverland regional towns of Renmark, Loxton and Berri.

The Region is serviced by the South Eastern Freeway, Princes, Dukes, Sturt and Mallee Highways, with Karoonda Road (running from Loxton to Murray Bridge) providing the main link diagonally across the Region.

1.3 Background to Submission

In responding to the Australia Government's "Inquiry into National Freight and Supply Chain Priorities" Discussion Paper released in May 2017 (Reference 1), it is pertinent to provide a brief background covering regional transport planning activities undertaken over the last five years by the Murray and Mallee Local Government Association (now trading as the Murraylands and Riverland LGA).

In June 2013, transport planning consultant HDS Australia Pty Ltd was engaged by the MRLGA to update the MRLGA's regional transport strategy. The resulting 2030 Regional Transport Plan, released in March 2014 (Reference 2), is a strategic level assessment of transport needs and priorities within the Region for the period from 2013 to 2030.

The 2030 Regional Transport Plan development project entailed three distinct stages, namely:

1. Identification of Land Use and Regional Transport Demands;
2. Development of Regional Transport Routes (Reference 3); and
3. Preparation of a Final Report.

Included in the first stage of the project was a substantial study of all currently available literature reflecting state level strategic planning, regional planning and development issues, regional transport planning and local transport plans. "Freight" considerations, along with "Tourism" and "Community Access", were considered to be fundamental to developing a regional transport network that was fit for its purpose and that underpinned economic prosperity for the Region.

In August 2014, HDS Australia was again engaged by the MRLGA, this time to assist MRLGA member councils undertake the next phase in their regional transport planning process, as defined within the "Methodology for Review and Update of the 2030 Regional Transport Plan". This project comprised two separate, but linked components, namely:

1. Stage 1 – Provision of assistance to the MRLGA and individual member councils with development of Regional Road Action Plans. The purpose of these Action Plans was to develop an overall funding priority list, and associated strategy for seeking additional funds when available, to enable all regionally significant freight, tourism and community access routes, as defined by the maps in the 2030 Regional Transport Plan Final Report, to operate at their "fit for purpose" standard.

2. Stage 2 – Provision of assistance to the MRLGA to undertake an independent review and prioritisation of detailed road upgrade proposals submitted by member councils.

Released in April 2015, then subsequently updated in June 2017 (Reference 4), the MRLGA Regional Road Action Plans indicate that 599 km of regionally significant local roads display at least one major deficiency in their "fit for purpose" standard. Total estimated cost to rectify these deficiencies is in the order of $ 40 million.

In February/March 2017, the MRLGA commissioned a further two studies to better quantify the overall freight transport task within the Region, including the risks and benefits of using higher productivity vehicles across a larger proportion of the regional local road network.

In the first project, titled "Regional Roads Freight Movement Study", key commodities produced within the Region have been identified, along with quantification of current and predicted tonnage and economic value for each commodity. The optimum level of higher productivity vehicle required to transport each commodity has also been determined, and key freight routes within and through the Region documented (refer to Appendix B). A draft report has been produced by consultant Tonkin Consulting (Reference 5), with the final report due for release by the end of September.

In the second project, titled "Commodity Route Heavy Vehicle Route Assessments and Risk Analysis", network level heavy vehicle route assessments are being undertaken for all gazetted 26m B-Double General Mass Limit and Commodity routes with the Region, along with additional potential rural B-Double routes. Using recognised safety risk profiling methods, all current and potential B-Double routes within the Region are being profiled, following which individual member councils will be able to make better informed decisions about expanding the B-Double network – particularly to more "farm gate" destinations. Project consultant HDS Australia has finalised four of the eight council reports, with remaining assessments due for completion by the end of September.

2.0 THE CASE FOR HIGHER PRODUCTIVITY VEHICLES

2.1 Economic Considerations

The freight transport industry is constantly striving to improve productivity and thereby lower unit costs, with three of the most significant opportunities arising from:

(1) **Use of higher productivity vehicles** on the existing road network, from semi-trailers to 26m B-Doubles (PBS Level 2A), short road trains (PBS Level 2B – 30m), road trains Type 1 (PBS Level 3 – 36.5m) or road trains Type 2 (PBS Level 4 – 53.5m);

(2) **More efficient freight movement** through use of both rural and urban routes optimised for heavy freight movement (particularly by reduction in the number of traffic lights in urban areas and the realignment of rural intersections to prioritise the heavy freight movement); and

(3) **More efficient freight handling** at intermodal facilities (e.g. grain silos, bunkers and port facilities, container terminals and intermodal road/rail terminals) including the "last mile" access to these facilities.

Traditional use of semi-trailers as the "workhorse" for road freight transport has now been surpassed by B-Doubles and the reason is clear. Research documented by Tonkin Consulting in Section 10 of the Regional Roads Freight Movement Study Draft Report (Reference 5), also in Appendix A to this submission, includes a comparison of typical vehicle operating cost (VOC) on a $/km basis against payload. Typically a B-Double offers a 61% increase in payload for a 13% increase in VOC. On a cost per tonne km basis, this means a potential reduction from 5.1 cents/km/tonne to 3.6 cents/km/tonne (a 30% saving).

It is clear that all medium and long haul freight cartage, where travel costs (rather than load/unload costs) are the significant component, should be undertaken using B-Doubles as a minimum size, provided the quantity of freight to be carried will fill the larger vehicle (which is not always the case). For road infrastructure managers (particularly at local government level) the challenge is to ensure that B-Doubles can access all desired locations in a safe and sustainable manner (see further discussion in Section 3.2 of this submission).

The economic justification for using vehicles larger than B-Doubles is more selective. On a generalised basis, again with reference to figures in the Tonkin report (Appendix A), a 30m road train (PBS Level 2B) offers a typical VOC of $1.53/km which equates to 3.5 cents/km/tonne. A 36.5m road train (PBS Level 3) offers a typical VOC of $1.65/km which equates to 3.45 cents/km/tonne. These VOC improvements are marginal over that of a B-Double, meaning that use of PBS Level 2B and above vehicles on the road network can really only be justified on a case by case basis, taking into account the unique freight situation for a given commodity travelling on a given route. The MRLGA has recognised this fact by initiating the Regional Roads Freight Movement Study to define "key freight routes" as those routes where use of PBS Level 2B and above vehicle classifications is specifically justified from an economic and/or safety perspective.

2.2 Safety Considerations

Anecdotally, it would be reasonable to assume that higher productivity vehicles are built and certified to a higher standard of safety than general classification rigid and articulated vehicles, because of their restricted access vehicle status. There are, however, a number of formal studies which confirm the generally held expectation that higher productivity vehicles are "safer", thereby justifying the introduction of more of these vehicles on safety (as well as economic) grounds.

One such study was carried out as Austroads Project FS1805. The findings from this study have been published on the DIRD web site under "Safety Benefit Analysis of Australian Higher

Productivity Vehicles – Findings from Austroads Project FS1805, Kim Hassall, Industrial Logistics Institute / NTARC, September 2014" (Reference 6). In particular, the slide titled "Examining MAJOR Truck Accidents per annum" (included as Appendix C to this submission) highlights the substantial reduction in reported major accidents, particularly on a rate per 100 million km (R100mK) basis but also on a rate per 10,000 vehicles (R10k) basis, between single articulated and B-Double vehicles. While the significant R100mK drop from 20.6 to 7.5 may partially reflect the medium hall nature of semi-trailer trips (i.e. which have greater exposure to urban roads at either end) vs the long hall nature of B-Double trips, **there is no doubt that, from recorded data, B-Doubles demonstrate a significantly safer performance on the road network when compared with single articulated vehicles**.

The same findings (Appendix C) also demonstrate that there is a proportionally smaller improvement in safety performance for B-Triples vs B-Doubles, while there is a reduction in safety performance for road trains (although these figures are statistically questionable given the much lower number of these vehicles operating on the road network). It is clear that there is no definitive further improvement in safety performance when operating vehicles larger than B-Double.

3.0 CHALLENGES FACING LOCAL GOVERNMENT

3.1 Regional Transport Planning – General

The M&MLGA (now MRLGA) 2030 Regional Transport Plan (Reference 2) outlines the goals and challenges faced by the eight councils in the MRLGA when managing their local road network. In developing a regional transport strategy for the Region, the following six regional transport goals were formulated:

Goal 1 – Economic Development

- A transport system that supports economic, industry and trade development across the Murraylands and Riverland Region.

Goal 2 – Access

- An equitable and accessible transport network that allows for consistent and reliable travel, with the capacity to use roads for their intended purpose.

Goal 3 – Road Safety

- A safe transport network where the severity and risk of accidents is minimised, and where speed limits are applied to fit community need not road standard.

Goal 4 – Tourism

- Promote and assist regional tourism, by improving road access to tourist sites and developing a network of well signed tourist routes.

Goal 5 – Public Transport

- Continued development of a public transport system commensurate with the needs of the Murraylands and Riverland Region, including subsidisation of regional bus services on an equitable basis to metropolitan bus services.

Goal 6 – Environment

- A transport network that minimises adverse impacts on the environment and communities.

Note that Goals 1, 2 and 3 have a strong focus on the movement of freight throughout the Region.

Consistent with the above goals, the following objectives underpinned development of the MRLGA 2030 Regional Transport Plan:

- Establish consistent regional road transport links within the Region which are of an appropriate “fit for purpose” standard.

- Develop a network of regional freight routes for heavy vehicles which complement the state government managed arterial road system by linking current and future significant sources of freight to their planned destinations.

- Reduce the impact of heavy vehicle movements through key centres, using township bypasses or by adopting appropriate traffic management within townships where a bypass is not feasible.

- Reduce the number of commercial vehicles on the road network by facilitating the safe operation of higher productivity vehicles.

- Ensure intermodal facilities, such as grain storage and handling sites, can operate in a safe and efficient manner.

- Reduce potential conflict between freight, tourism and community access users of the road network, particularly at intersections.

- Promote and assist regional tourism, by improving road access to tourist sites and developing a network of well signed tourist routes.

- Maintain and, as needed, upgrade existing ferry operations across the River Murray to ensure they remain an essential component of the regional tourism and community access networks.

- Ensure that all communities in the Region have safe and reliable access to essential community services such as health, education, financial services, recreation facilities and emergency services.

- Upgrade regional airports where economically feasible, particularly Monarto as an important freight facility and Renmark as an important community access facility.

- Improve public transport facilities within the Region.

- Encourage commuter cycling within key towns and important centres, as well as tourist cycling for selected routes, particularly along the River Murray.

Phase 2 of the MRLGA regional transport planning process (Reference 4) entailed a network wide assessment of deficiencies in regionally significant local roads and the creation of Regional Road Action Plans which highlight, at a strategic and operation level, deficiencies in that network. While many of those roads have a freight purpose, the road action plans are not exclusively focussed on freight. The economic benefits from maintaining fit for purpose roads that have a primary purpose of tourism, along with the social inclusion benefits from maintaining fit for purpose roads that have a primary purpose of community access, are also recognised as being of importance to the Region's current and future prosperity.

Adoption of the 2030 Regional Transport Plan has been a fundamental step in developing a coordinated approach amongst the eight member councils of the MRLGA, in association with the state government Department of Planning, Transport and Infrastructure (DPTI), towards overall regional transport planning and agreement about road infrastructure funding priorities.

Consideration should be given to mandating the creation of regional transport plans that provide a vital link between national and state highway transport planning considerations and the detailed needs of local government.

3.2 Regional Transport Planning – Freight Considerations

Phase 3 of the MRLGA regional transport planning process has returned to a primarily freight focus, in recognition that there is a need for safe operation of higher productivity vehicles on the local road network.

3.2.1 Commodity Route Assessment and Risk Analysis

Acknowledging economic considerations in the case for higher productivity vehicles (refer to Section 2.1), particularly potential adoption of B-Doubles as the default medium and long haul freight vehicle, the MRLGA has initiated a network level heavy vehicle route assessment across the Region. Titled "Commodity Route Heavy Vehicle Route Assessments and Risk Analysis", assessments are being undertaken for all gazetted 26m B-Double General Mass Limit and Commodity routes with the Region, along with additional potential rural B-Double routes. Using recognised safety risk profiling methods, all current and potential B-Double routes within the

Region are being profiled, following which individual member councils will be able to make better informed decisions about expanding their B-Double network – particularly to more "farm gate" destinations. Project consultant HDS Australia has finalised four of the eight council reports, with remaining assessments due for completion by the end of September.

A typical outcome from these assessments is shown in the final report prepared for Coorong District Council (Reference 7). In summary, for that council:

- 14 road segments within currently gazetted GML routes and 8 road segments within currently gazetted Commodity routes were assessed as a P1 "very high risk" for B-Double vehicles. In the context of the overall gazetted network length, this equates to 2% of B-Double GML routes and 2% of Commodity routes.

- 42 road segments within currently gazetted GML routes and 44 road segments within currently gazetted Commodity routes were assessed as a P2 "high risk" for B-Double vehicles. In the context of the overall gazetted network length, this equates to 6% of B-Double GML routes and 8% of Commodity routes.

Collectively, about 10% of the existing gazetted B-Double routes in this council's local road network fail to meet an appropriate (moderate or below) level of risk for use by B-Doubles. While it is unlikely that many (if any) of these roads will be withdrawn from the gazetted B-Double network, works priorities will be re-set to focus on achieving short and medium term improvements to these road segments (mostly intersections) to lower the risk profile at each site to a more appropriate level.

In addition, further findings in the Coorong District Council report reveal:

- A total of 357 km of "Other" routes were assessed as part of the Network Level HVRA. These are roads which Coorong District Council is considering for use by B-Doubles, either as a gazetted B-Double Commodity route or under annual permit arrangements.

- 11 road segments within the "Other" routes were assessed as a P1 "very high risk" for B-Double vehicles. In the context of the overall "Other" network length assessed, this equates to 1% of the routes.

- 107 road segments within the "Other" routes were assessed as a P2 "high risk" for B-Double vehicles. In the context of the overall "Other" network length assessed, this equates to 21% of the routes.

The remaining 78% by length of "Other" routes (approximately 280 km) was assessed as moderate or low risk, allowing for immediate consideration of these routes for gazettal by the NHVR as B-Double Commodity routes.

3.2.2 Regional Key Freight Routes

Section 2.1 of this submission highlights that, while the productivity improvements associated with use of B-Doubles are clear, the economic justification for using vehicles larger than B-Doubles is more selective. Recognising this, the MRLGA has commissioned a project, titled "Regional Roads Freight Movement Study", in which major commodities produced within the Region have been identified, along with quantification of current and predicted tonnage and economic value for each commodity. The optimum level of higher productivity vehicle required to transport each commodity has also been determined, and key freight routes within and through the Region documented. A draft report has been produced by consultant Tonkin Consulting (Reference 5), with the final report due for release by the end of September.

It is expected that study findings will confirm a network of regional key freight routes (comprising state arterial roads and regionally significant local roads) that complement and connect with the national key freight routes (comprising national highways and selected state arterial roads) already documented on the National Key Freight Routes Map shown on the DIRD web site at http://maps.infrastructure.gov.au/KeyFreightRoute/index.html.

3.2.3 River Murray Ferries

River Murray ferry services provided to communities within the Murraylands and Riverland Region are critical to the economic, social, tourism, health and emergency services of these communities. There are 12 ferries in operation along the River Murray throughout the Region, at eleven different sites (two operate at Mannum).

Table 13.1 from the "MRLGA Regional Roads Freight Movement Study – Draft Report" (Reference 5) summarises ferry locations (in order from upstream to downstream), together with key information regarding the length and capacity of each. The table is re-printed below:

Table 13.1 Ferry technical information (as provided by DPTI)

Ferry location	Deck length* (metres)	Hull type	Annual average daily traffic count (2011)	Deck width* (metres)	Vehicle capacity ** (units)	Maximum carrying capacity*** (tonnes)
Lyrup	18	Wooden	258		8	50
Waikerie	30	Steel	608		12	90
Cadell (16t weight restriction)	18	Wooden	98		8	50
Morgan	30	Steel	434		12	90
Swan Reach	25	Steel	317		8	75
Purnong	25	Steel	119		8	75
Walker Flat	25	Steel	252		8	75
Mannum U/S (10t weight restriction)	18	Wooden	439		8	50
Mannum D/S	30	Steel	712	3.5*	12	90
Tailem Bend	18	Wooden	400		8	50
Wellington	30	Steel	496		12	90
Narrung	18	Steel	81		8	50

**Heavy vehicles that exceed the standard length or width must have an appropriate permit to use ferries.*
**Ferries fitted with extended flaps have a width restriction of 3.5m.*
**Concrete river bank landing width is 5.0m.*
***A unit is classified as equal to the size of an average family sedan type car.*
****Heavy transport in excess of 42.5 tonne must have an appropriate permit to use ferries.*

Of the 12 ferries currently in operation, only four (Waikerie, Morgan, Mannum DS and Wellington) are capable of transporting a 26m B-Double across the River Murray, based upon length and carrying capacity. However, according to DPTI's RAVnet web site, even these four ferry sites are not included as part of the 26m B-Double GML network.

It is understood that the four wooden hulled ferries listed above are more than 60 years old and require replacement. The state government has committed to replacement of these four timber hulled ferries with steel hulled vessels by 2018. The new steel hull ferries will be 22m in length to allow for additional cars but do not have the length nor the capacity to accommodate B-Doubles. This could be seen as a retrograde step, given that it will further prolong any expansion of the B-Double GML network's crossing points for the River Murray, leaving the network severely constrained by the existing five road bridges (three of which are in the Riverland, leaving only the national highway bridges at Blanchetown and Swanport as B-Double crossing points along the lower reaches of the River Murray).

In the near term, ferries at Waikerie, Morgan, Swan Reach, Mannum and Wellington need to be re-considered to take 26m B-Doubles, in order for the full productivity gains available from broader use of B-Doubles within the Region to be fully realised. Further detailed discussion about the importance of the River Murray ferries to the efficient movement of freight within the Region, plus current restrictions in their ability to carry B-Doubles, is contained in Section 13 of Reference 5.

3.3 Identifying and Funding the Gap

It has already been highlighted in Section 1.3, that the total estimated cost to rectify major assessed deficiencies in the Region’s regional road network is in the order of $ 40 million. This figure only addresses regionally significant local roads which provide demonstrated economic benefit to the Region as a whole. It does not include investment by state government in the Region’s state arterial roads, nor investment by the eight member councils in the remainder of their local road network (which is substantial).

Apart from councils utilising some of their untied federal assistance grants and/or limited rate revenue (both at the expense of other capital works and recurrent expenditure), there are at present only two primary sources of road funds specifically targeting improvement to the regionally significant local road network. These are the state government coordinated Special Local Roads Program and associated Roads to Recovery program, as well as the National Heavy Vehicle Safety and Productivity Program. Between them, approximately $2.5 million per annum in grant funds is allocated to the Region. When matched 1 for 2 by council funds, about $4 million per annum is spent on upgrading regionally significant local roads to a fit for purpose standard. At this rate, and assuming (incorrectly) that there will be no further deterioration in the existing regional road network, it will take at least 10 years to address all currently identified major deficiencies in the network.

In addition to the currently identified $ 40 million shortfall, introduction of an expanded level of gazetted B-Double Commodity routes (refer to Sections 2.1 and 3.2.1) will place a further strain on scarce council resources, while introduction of even larger vehicles onto regional key freight routes (refer to Sections 2.1 and 3.2.2) will place a considerable further financial strain on the Region as a whole. There are clear economic and safety benefits in allowing greater use of the local road network by higher productivity vehicles, but currently the funds are not available to achieve this in a safe and sustainable manner.

4.0 FUTURE TECHNOLOGY ISSUES

4.1 Autonomous Freight Vehicles

One aspect related to the productivity of heavy freight vehicles is driver fatigue. There are strict regulatory requirements for heavy vehicle driver rest periods, as documented on the NHVR web site at https://www.nhvr.gov.au/safety-accreditation-compliance/fatigue-management/work-and-rest-requirements/standard-hours. Unfortunately, in the interest of "productivity", driver rest requirements are not always adhered to, creating increased safety risk on the road network due to heavy vehicle driver fatigue.

Potential exists for productivity improvement via the introduction of autonomous heavy vehicles on the national freight network. These vehicles would comply with, as a minimum, the SAE J3016 Level 3 definition for automation (refer to Appendix D), involving "Conditional Automation: The driving mode-specific performance by an Automated Driving System of all aspects of the dynamic driving task with the expectation that the human driver will respond appropriately to a request to intervene". In this circumstance, heavy vehicles would still have drivers ready to intervene when required, but the level of driver concentration when Level 3 automation was engaged would be much less, enabling drivers to effectively meet their requirement for intermediate "rest" periods (15 minute breaks) while still behind the wheel. Drivers would also be less fatigued overall on long haul routes, with greater time spent at the lower concentration level associated with Level 3 automation, thereby improving alertness when the need to intervene arises.

Further potential exists for the introduction of fully autonomous heavy vehicles, operating at SAE J3016 Level 4 automation (refer to Appendix D). This involves "High Automation: The driving mode-specific performance by an Automated Driving System of all aspects of the dynamic driving task, even if a human driver does not respond appropriately to a request to intervene". More research is required to determine the safety imperatives associated with Level 4 automation, but in theory it would allow drivers to sleep on designated rural sections of key freight routes while the Level 4 automation was engaged.

Full autonomous *and driverless* heavy vehicles operating on the public road network (i.e. SAE J3016 Level 5 automation) is seen as unrealistic and inherently unsafe in the short and medium term (e.g. to 2030). There are too many variables across the network.

A national regulatory framework needs to be introduced defining the parameters by which heavy vehicles could operate under Level 3 (conditional automation) and Level 4 (high automation) driving conditions. For Level 4 conditions, this would need to be coupled with the "connected freight vehicles" initiatives explained in Section 5.2.

National freight network infrastructure planning will also need to be fully implemented before introduction of autonomous freight vehicles, especially at Level 4. In particular, operation of autonomous freight vehicles should be restricted to approved key freight corridors, where available road geometry presents a low to moderate risk profile under current national "heavy vehicle route assessment" guidelines.

4.2 Connected Freight Vehicles

Technology supporting "connected freight vehicles" has been around for decades. First HF and VHF radios provided drivers with a manual method of communicating with each other, providing drivers with information on the route ahead via discussion with fellow drivers along the route. Introduction of mobile phones has expanded this capability, still with manual use by drivers. GPS based navigation and route optimisation systems has followed, now coupled with real-time internet based automated "look ahead" reports of traffic hazards and general traffic conditions. These technologies are all active, to varying degrees, in all heavy vehicles today.

Looking forward, heavy vehicles are expected to increasingly adopt, on the public road network, communication technologies currently being implemented on private road networks, including mine sites and container terminals. Regulatory action to enable connected freight vehicles to operate on the public road network is required to accelerate the process of introducing current and future connected vehicle technologies, thereby increasing productivity while maintaining or improving safety.

Two key connected freight vehicle technologies, which currently exist and are improving rapidly, should be implemented as soon as a suitable regulatory framework is defined.

4.2.1 Collision Avoidance System

Worldwide, all international and domestic aircraft operate a collision avoidance system (and have done so for a considerable period of time). Aircraft communicate automatically with each other, exchanging details of position, speed and heading, allowing for spatial separation calculations to be determined and flight adjustments made (automatically or manually via an alarm to the pilot). With improved Vehicle to Vehicle (V2V) communication technology now available, all restricted access heavy vehicles (i.e. B-Doubles and larger) should be required to operate a V2V collision avoidance system which could:

(1) warn drivers who are travelling too close behind heavy vehicles in the same direction for the given speed, and adjust spacing accordingly;

(2) warn drivers that heavy vehicles are approaching from the opposite direction, particularly at crests and curves where site distance is limited; and

(3) warn drivers waiting to turn at intersections (often a high or very high risk site involving vehicles crossing through traffic lanes) of approaching heavy vehicles and their speed, allowing suitable manual (or automated) decisions as to whether it is safe to commence the turn manoeuvre.

Introduction of a V2V collision avoidance system would mitigate risk, enabling safer operation of heavy vehicles generally, but would be particularly beneficial in expanding access of B-Doubles to the “farm gate”, since many local rural roads are currently a high risk or very high risk for use by B-Doubles, limiting access and therefore productivity.

When combined with Level 3 or Level 4 automation of heavy vehicles, the collision avoidance system would significantly reduce the likelihood of a potentially catastrophic collision between two heavy vehicles, providing public assurance that multiple “fail safes” are built in to any heavy vehicle automation process.

4.2.2 Intersection Warning System

While a heavy vehicle collision avoidance system would improve safety associated with the interface between heavy vehicles, there are also significant safety risks associated with the interface between heavy vehicles and other road users. These risks are most prominent at intersections, whether controlled by traffic lights, stop or give way signs, or uncontrolled.

Technology required for an intersection warning system is already in use by emergency service vehicles on urban road networks, whereby the approach of an emergency vehicle is transmitted to traffic light controllers in sufficient time for a stop/go override sequence to be initiated. This enables traffic to be halted on cross roads, improving the emergency vehicle’s through route speed and therefore incident response time, as well as the safety of both the emergency vehicle and other road users. Such controls are less common on rural roads, except for the obvious analogy of activated rail crossing signals and road barriers.

If introduced, an intersection warning system would use the same technology adopted for the collision avoidance system, but this time in a Vehicle to Infrastructure (V2I) mode.

For urban environments, heavy vehicle V2I communication with traffic light controllers would operate in two modes. Controllers for traffic lights which are about to turn red would advise the heavy vehicle of this fact, requiring a positive response by either the driver or, if fitted, a Level 3 or 4 automated vehicle system, to commence breaking. Should there be no response, the traffic light controller would delay the cross road green cycle until the heavy vehicle had passed through the intersection or reacted to the red light and slowed accordingly. Should the heavy vehicle pass through the intersection against a red light, V2I identification of that particular vehicle would result in an appropriate “red light” fine, regardless of whether the intersection was monitored by a red light camera.

For rural environments (and potentially at non traffic light intersections in urban settings), the use of illuminated (flashing) stop and give way signs which alert the driver to an approaching heavy vehicle on the cross road, much like active rail crossings (but simpler), would add a higher degree of alertness for all drivers attempting to enter the intersection, particularly where limited visibility of approaching vehicles is available. Greater availability of solar power, battery storage and low energy LEDs means that these facilities could be cost effectively located at rural intersections where traditional power sources are not readily available nearby.

5.0 RECOMMENDATIONS

The following recommendations are presented as conclusions from this submission:

1. Based upon both economic and safety considerations, regulatory and infrastructure planning shall allow for all medium and long haul general freight cartage to be undertaken using B-Doubles as the standard freight transport vehicle, adopting HML (PBS Level 2A) load classifications wherever practicable and restricting routes to GML load classification only where existing bridge/road load capacity is economically prohibitive to upgrade.

2. State and local government jurisdictions be encouraged to adopt a risk based approach to ensure that B-Doubles can access all desired locations in a safe and sustainable manner, with operational controls on vehicle movement imposed where infrastructure upgrade costs are beyond the immediate capacity of the jurisdiction to implement.

3. In support of Recommendations 1 and 2, as specifically applied to the Murraylands and Riverland Region of South Australia, federal funding be made available to upgrade the River Murray ferry services at Waikerie, Morgan, Swan Reach, Mannum and Wellington to handle 26m B-Double GML (HML if possible) vehicles.

4. Commodity based “regional key freight routes”, allowing transport of specific commodities using PBS Level 2B or higher classifications, be identified and specifically justified on a case by case basis (using nationally agreed economic and/or safety benefit criteria), then gazetted and managed by the National Heavy Vehicle Regulator’s Journey Planner mapping tool. These regional key freight routes would complement the national key freight routes already in place.

5. Funding of all “regional key freight routes” be fully assumed by the Federal Government, under a scheme similar to the current national highway program, with “tied” funds directed to state or local government jurisdictions specifically for maintaining key freight routes at an agreed fit for purpose standard.

6. Individual routes which are approved for use on a “one off” or limited basis by PBS Level 2B and above vehicle classifications, but are not deemed as “key freight routes” by virtue of not meeting the nationally agreed criteria, to remain funded by state and local government jurisdictions using existing funding sources and potentially with private sector contributions.

7. A national V2V based collision avoidance system, similar to the current aircraft collision avoidance system, be introduced for all restricted access vehicles (i.e. B-Doubles and larger).

8. National standards be developed and trialled for the introduction of common V2I communication protocols that allow intersection warning systems to be introduced, as deemed appropriate, by individual state and local government jurisdictions.

Appendix A

Heavy Vehicle Operating Costs

10 Preferred Vehicle Classification

10.1 General

The preferred vehicle classification identified by producers and processors for the transport of commodities is dependent on several factors. This includes, but is not limited to, the following:

- Vehicle operating costs
- Type of commodity transported
- Intended commodity destination (eg. Local, domestic or international export)
- Seasonality in commodity
- Demand for commodity (local and/or international)
- Particular commodity transport requirements (eg refrigeration, side tippers, etc)

10.2 Vehicle Operating Costs

Stakeholder input indicates that in general, the vehicles currently used to move freight to, from and through the region comprise semi-trailers, B-doubles and 30m road trains.

Vehicle operating costs (VOCs) for these vehicles have been derived from the Transport and Infrastructure Council's "Australian Transport Assessment and Planning Guidelines – PV2 Road Parameter Values" 2016. The VOC values provided in Section 5.3 of this publication however do not extend beyond B-doubles (L2A vehicles). Consequently, estimations of the vehicle operating costs associated with Super B-Doubles (L2B vehicles) and Road Trains (L3A vehicles) were calculated from a model supplied by the "Australian Transport Assessment and Planning Guidelines – PV2 Road Parameter Values" 2016, under Section 5.3.2.

The model provides a Base VOC and VOC Coefficients for various road conditions. For this study, assumptions have been made to approximate the average road conditions throughout the region. It has been assumed that the roads are straight, have minimal gradient, a roughness coefficient of 0.9 and an average speed of 100km/h. Under these conditions, parameters for the Super B-Double (L2A) vehicle) were selected based on an average of those provided for the 'B-Double' and 'A-Double'. The Base VOC and VOC Coefficients for the Road Train (L3A vehicle) was based on values provided for the 'A-Double'. Table 10.1 summarises the VOCs determined for each vehicle type. Costs have also been adjusted for inflation between 2013 (the published date of coefficient derivation) and 2017. The payload for each truck size was also obtained from Truck Impact Charts produced by the Australian Trucking Association.

Table 10.1 VOCs for Vehicle Types, including Extrapolated VOCs

VOC Source Type	Vehicle Type	VOC ($/km)	% VOC difference, compared to semi-trailer	Payload (t)	% payload difference, compared to semi-trailer
Extracted	6 Axle Articulated Truck/Semi-trailer	1.24	0%	24.13	0%
Extracted	B Double (9 axle) – PBS L2A	1.40	+13%	38.93	+61%
Extrapolated	Super B – PBS L2B	1.53	+24%	43.35	+80%
Extrapolated	Road Train - PBS L3a	1.65	+33%	47.77	+98%

Table 10.1 demonstrates the increase in VOC, as well as carrying capacity, for B-Doubles, Super B-Doubles and Road Trains when compared to semi-trailers. Where commodity freight can be transported by B-Doubles rather than semi-trailers the payload can be increased by 14.8 tonnes, representing a capacity increase of 61%. This increase in capacity corresponds to an increase of only 13% in vehicle operating costs. Similarly, the selection of Super B-Doubles over semi-trailers results in a capacity gain of 80% for a 24% increase in cost. The selection of Road Trains over semi-trailers results in a capacity gain of 98% for a 33% increase in cost. Comparison of vehicle operating costs suggests there are significant advantages to increasing the vehicle size and capacity used to transport goods.

The total current annual operating cost for each commodity was not determined as part of this study. This is complex for the region and influenced by a number of factors; a separate study would be required to quantify this. The future annual operating costs as a consequence of changes in the road network, is also difficult to determine and influenced by a number of factors.

These include, but are not limited to, the following:

- Route selection: Changes in the route network may influence road restrictions and therefore the routes selected for freight movement
- Growth and composition of products for each commodity: Production volumes may change over time. The composition of products and by-products in each supply chain may also change; for example, production efforts may shift from milk to cream, in response to consumer demand and market prices.
- Production and processing facilities: The location and type of vehicles accommodated at production and processing facilities influences annual operating cost.
- Adjustments in technology that influence production: Improvements in technology may also influence annual operating costs.

10.3 Safety of using larger vehicles

Studies indicate there are safety advantages associated with utilising larger vehicles to transport freight. A study conducted by Hassall and Thompson (2016) used an investigation conducted by Austroads in 2014 and crash data obtained by National Transport Insurance (NTI) between 2005 and 2011 to demonstrate that fewer accidents are seen for larger heavy vehicles when compared to conventional trucks. It found the total number of accidents for larger heavy vehicles (including Super B-Doubles, A-Doubles and Road Trains) is 75% below the number of accidents for conventional rigid and articulated trucks per 100million kilometres.

Hitchins and Ritzinger (2016) noted that reduced road crashes of larger heavy vehicles could be attributed to increased safety performance of these vehicles. Given all PBS vehicles must satisfy a number of stringent performance standards, vehicles of this kind typically have a higher level of safety than earlier vehicles. It noted also that reduced crashes may also be attributed to increased levels of enforcement.

10.4 Factors influencing the choice of truck size

Several factors generally guide decision-making surrounding the selection of a preferred vehicle classification for the transport of commodities.

The type of commodity being transported will influence the heavy vehicle selected. Larger vehicles are generally required for the transport of large commodities; for example, B-Doubles are preferred for the transport of livestock over single taut liners used for the transport of almond hulls and shells. Additionally, some commodities may require specific requirements for their transport; dairy milk requires tankers whereas bulk commodities (such as hay) can use more rudimentary and standard equipment.

The intended destination of the commodity will also influence decisions around which heavy vehicle can be used to transport it. Where the transport of products for bulk export are to be coordinated, a higher transport efficiency is required. Trucks with greater payloads maximise export volumes. For example, it would be beneficial to utilise larger trucks to transport high volumes to a railway, where it can be loaded and transported by bulk to the port. Viterra noted a preference for larger trucks in transporting grain to Tailem Bend, after which it can be moved by rail to port for export.

Seasonality will also influence the type of vehicle used for transport. During peak harvest, or during particularly good seasons, larger trucks with greater payloads and lower marginal costs are justified. For example, during grain harvest time, larger vehicles can be used to transport larger payloads, reduce truck queues and therefore improve efficiency in moving grain to silos or ports (Transport Vic 2011). Conversely, during seasons of low productivity, larger capacities (and their associated costs) are not required.

Demand for commodities will also influence volumes of product grown and therefore likely the choice of vehicle used to transport it. Where demand is high, larger trucks can be chosen. During periods of lower demand, trucks with greater payload capacity and higher costs are not required.

Several factors will also influence pricing of commodities and therefore output volumes, which in turn affects selection of heavy vehicle used for transport.

In noting these influencing factors, it should be reiterated that the task of relating production volumes and freight transport is complex.

10.5 Preferred vehicles for commodity movements

Key stakeholders have expressed a desire for change to the PBS classification of commodity transport routes for half of the key commodities, to more efficiently and economically service the overall freight task. These are summarised in Table 10.2.

Table 10.2 Preferred PBS classification for key commodity transport routes

Commodity	Current Transport Vehicle type/s	Preferred PBS Classification
Almonds	Vans, High-sided tippers and trailers, single taut liners, B-Doubles	**Road Trains (to/from cracking facility)**
Citrus	Semi-trailers, B-Doubles	**Road Trains**
Dairy	Refrigerated tankers (B-Doubles)	*No change*
Grain	B-Doubles, 30m short Double Road Trains	**Tri-dolly road trains**
	Semi-trailers and B-Doubles	
Green Leaf Vegetables		*No change*
Hay	Road Trains, B-Doubles and Semi-trailers	**Road Trains, B-Doubles**
Livestock	Semi-trailers and B-Doubles	**44m AB Triple routes, 27m B-Doubles, 35m B-Triples between Pt Pirie and Murray Bridge, B-Doubles**
Mushrooms	Semi-trailers and B-Doubles	*No change*
Olives	Unknown (Semi-trailers assumed)	*Unknown*
Pork	Semi-trailers and B-Doubles	*No change*
Poultry	Semi-trailers, Prime Movers, B-Doubles, Rigid Trucks	*No change*
Root Vegetables	Semi-trailers and B-Doubles	**B-Doubles**
Organic Materials and Waste	B-Doubles,Truck and Trailer, 6mx 4m garbage trucks	*No change*

Commodity	Current Transport Vehicle type/s	Preferred PBS Classification
Wine Grapes	Semi-trailers, B-Doubles	**B-Doubles, B-Triples, Road Trains (A-Doubles)**

The ability of various elements of the road transport network to become gazetted for higher transport vehicle classifications however will be dependent upon more detailed, site based heavy vehicle route assessment.

In addition, consideration will need to be given to the physical and operational characteristics of associated origins and destinations and ‘first and last mile issues’. There is little point for example, in gazetting the Sturt Highway to facilitate the movement of citrus between the Riverland and Regency Park if facilities as each end cannot manage the loading and unloading process, or access/egress in general.

Appendix B

Production Value for Regional Commodities
and Key Freight Routes

Almonds

Annual Regional Production
16,000t

Annual Production Value
$114.7M

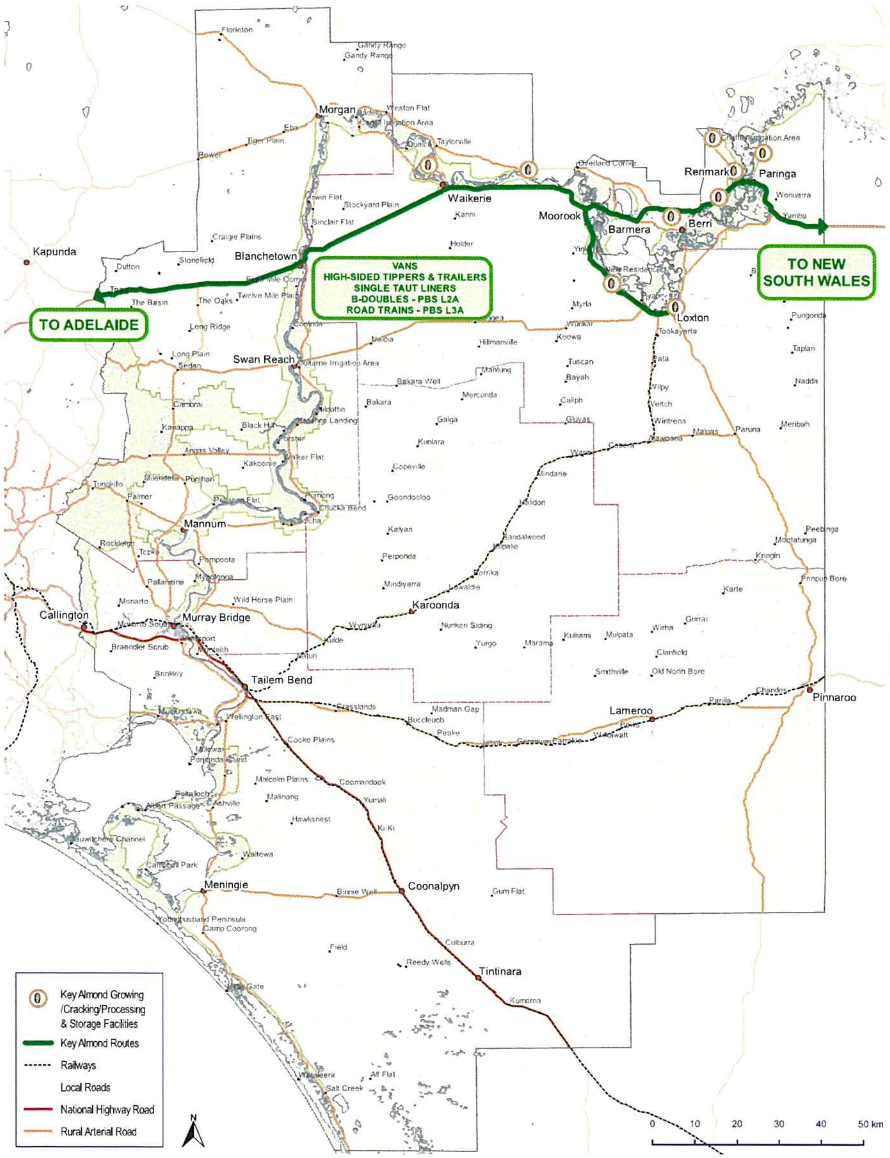
Seasonality
Harvest from February to April

Key Transport Routes
Sturt Highway
Goyder Highway, Waikerie
Murtho Road, Paringa
Staroevich Road, Loxton
Kingston Road, New Residence
Coottong Avenue, Coottong

Key Transport Issues
Use of road trains would reduce deliveries from growers to the cracking facility, and between the cracking facility and feedlots

There are concerns with the poor quality of infrastructure of the Paringa Bridge, the Lyrup Ferry, and the roundabouts in Berri

Key Transport Routes



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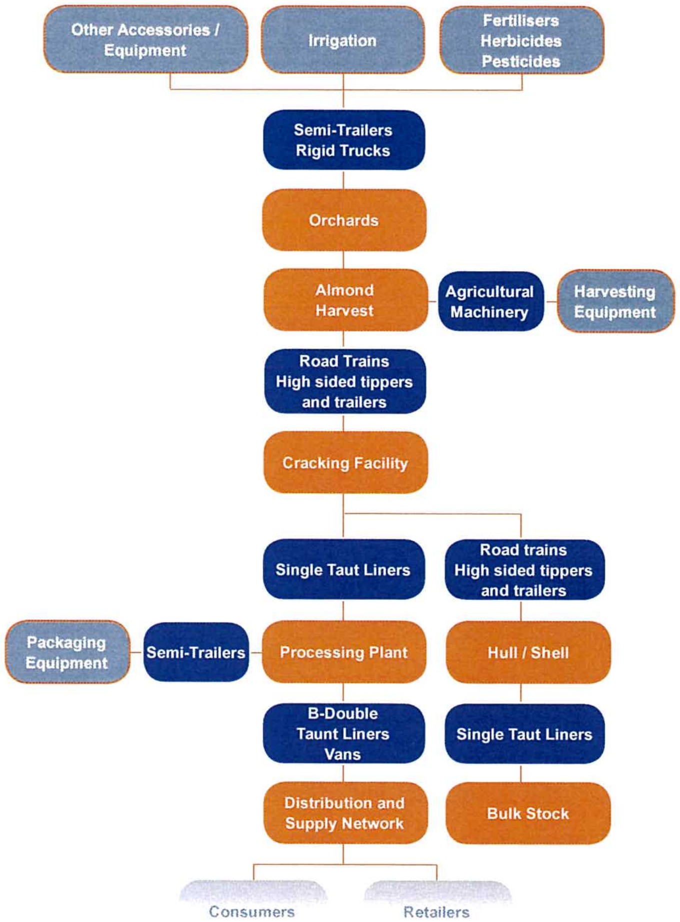


Citrus

Annual Regional Production

200,000t

Annual Production Value

$68M

Seasonality

June to November

Key Transport Routes

Sturt Highway
Northern Expressway
Port Wakefield Road (National Highway)
Salisbury Highway
Port River Expressway (National Highway)
South Road (National Highway)
Grand Junction Road (Arterial Road)
Biralee Road, Regency Park (Local Road)
Karoonda Highway
Ngarkat Highway
Dukes Highway
Chowilla Street, Renmark (Local Road)
Beherendts Road, Murtho
Murtho Road

Key transport Issues

Would like to see a Road Train Route from the Riverland to Regency Park

More overtaking lanes required on the Sturt Highway

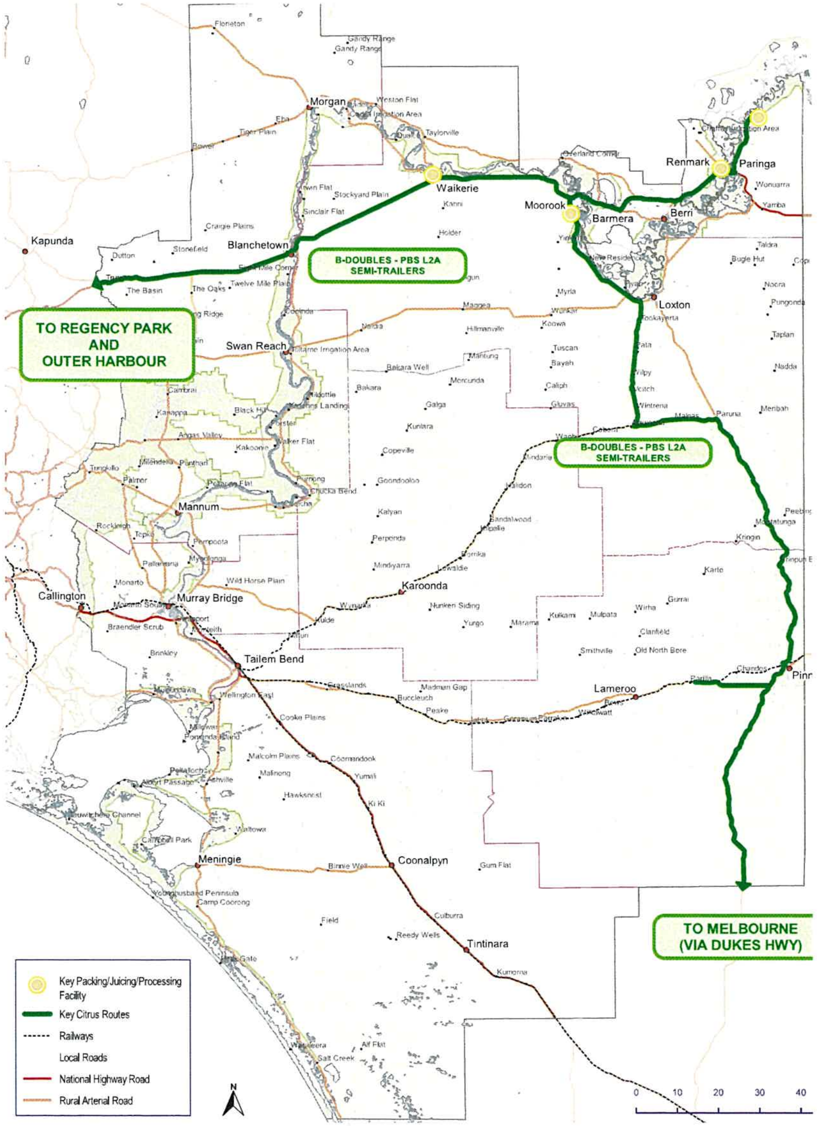
Need for a dual lane highway from the Riverland to Adelaide

Need for a bypass of the Truro township

A gazetted route for movement of 40' refrigerated containers from Renmark to Adelaide would avoid the need for annual transport permit renewal

40' refrigerated containers are not permitted to be road freighted through Victoria to the Port of Melbourne, and therefore must travel to Adelaide and then be loaded onto rail

Key Transport Routes



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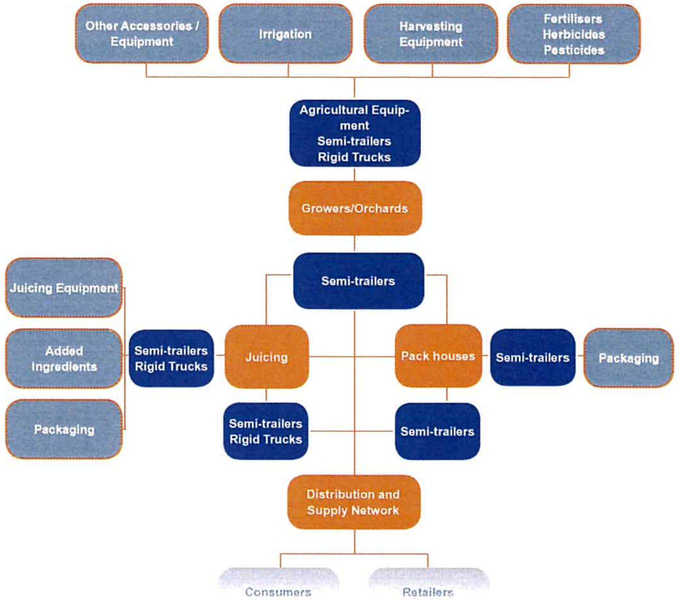


Dairy

Annual Regional Production
170 million litres

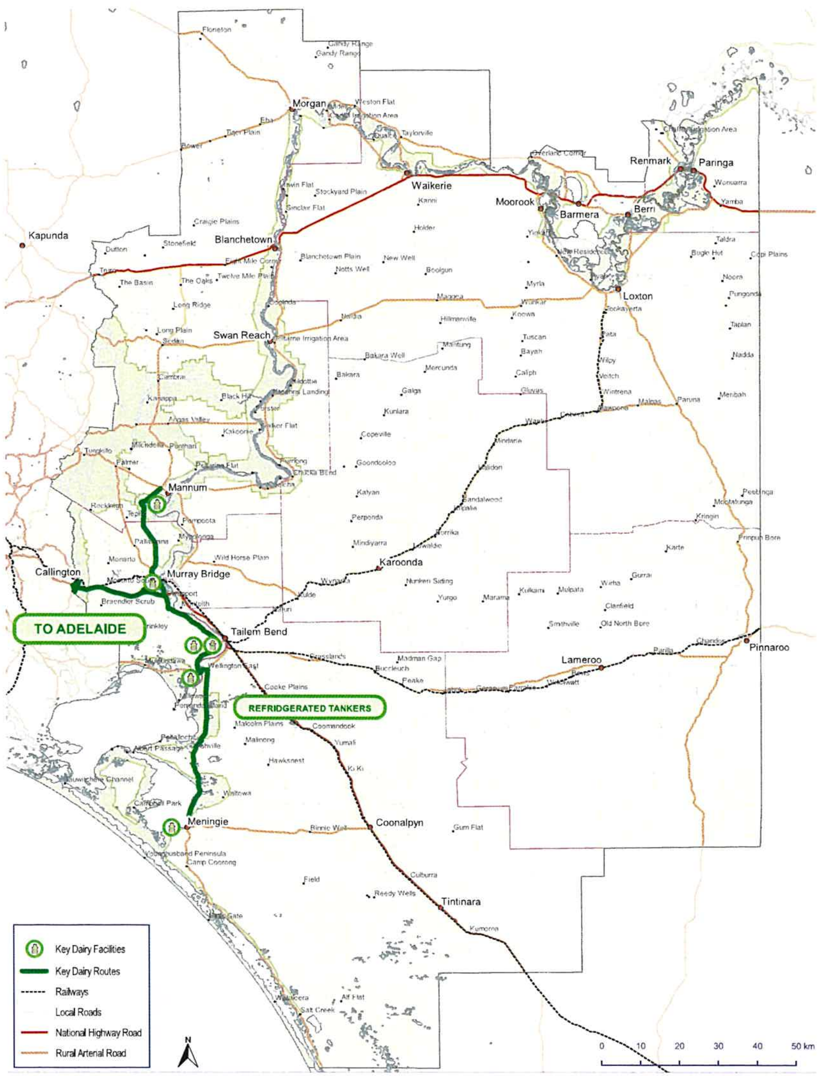
Annual Production Value
$71.4M

Seasonality
All year round

Key Transport Routes
South East Freeway
Princes Highway
Jervois Road
Mannum Road

Key transport Issues
None identified

Key Transport Routes



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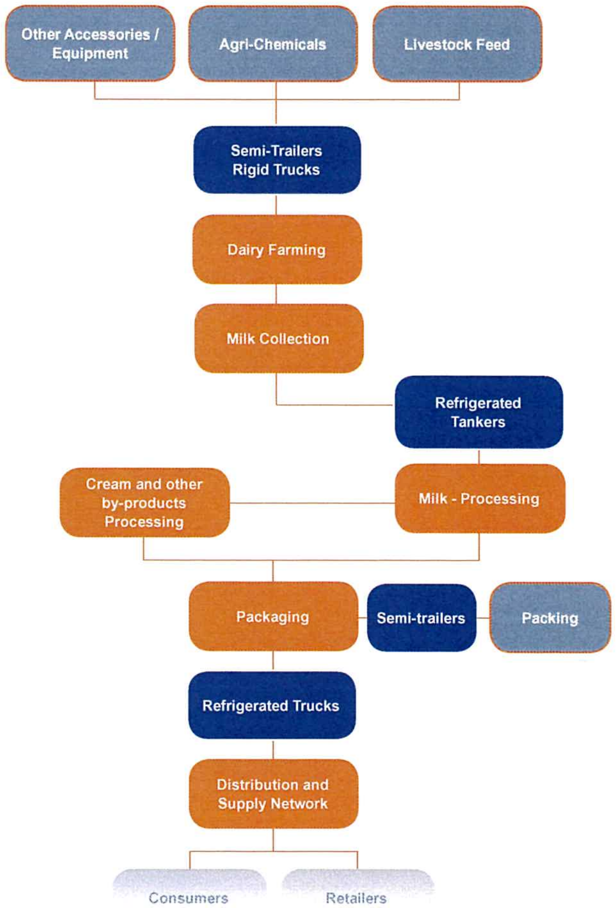


Grain

Annual Regional Production
0.5 - 1.5Mt

Annual Production Value
$104 - $312M

Seasonality
October - December

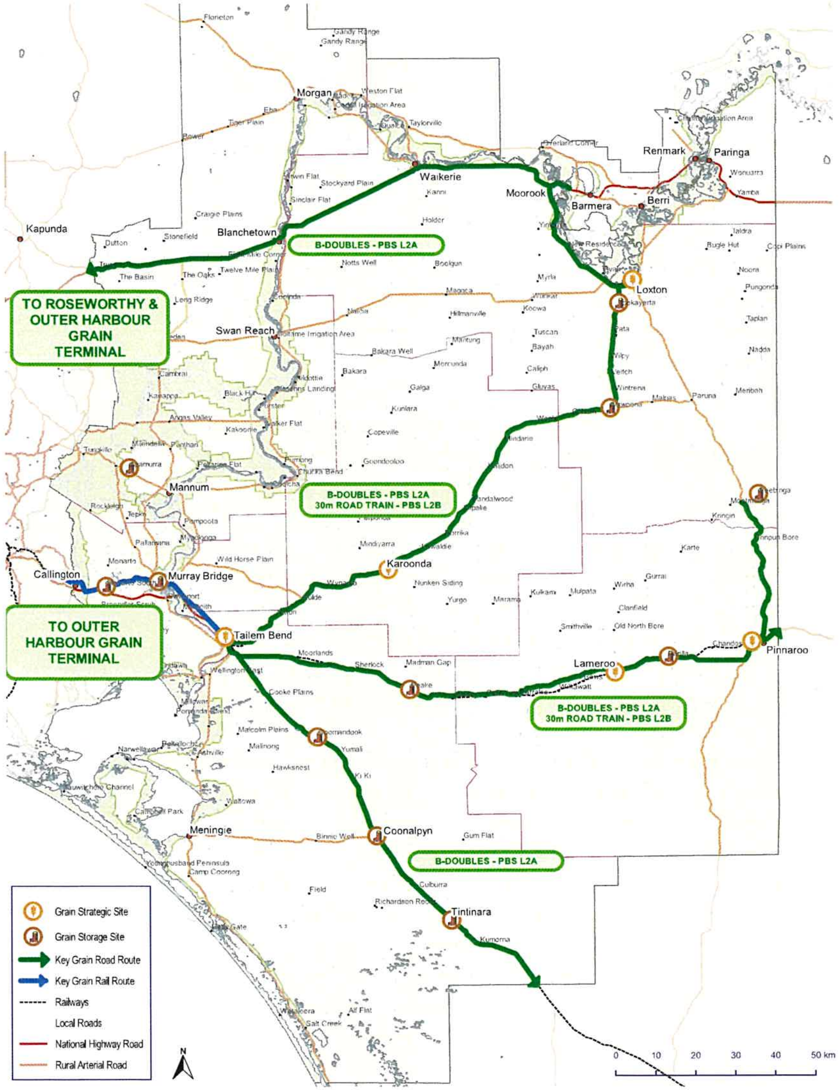
Key transport Issues
Larger trucks desired for movements into Tailem Bend

Restricted vehicle access for some vehicles affects freight rates, storage viability and risks eventual facility closure

Truck availability

Major grain movement between Tailem Bend and Port Adelaide considered best served by rail

Key Transport Routes



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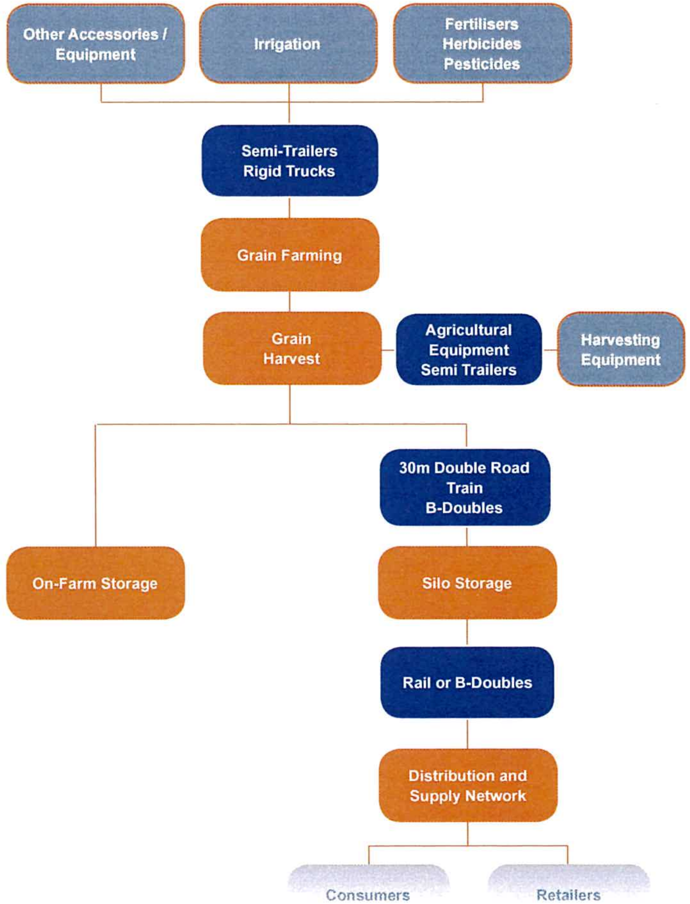


Green Leaf Vegetables

Annual Regional Production
3,000t

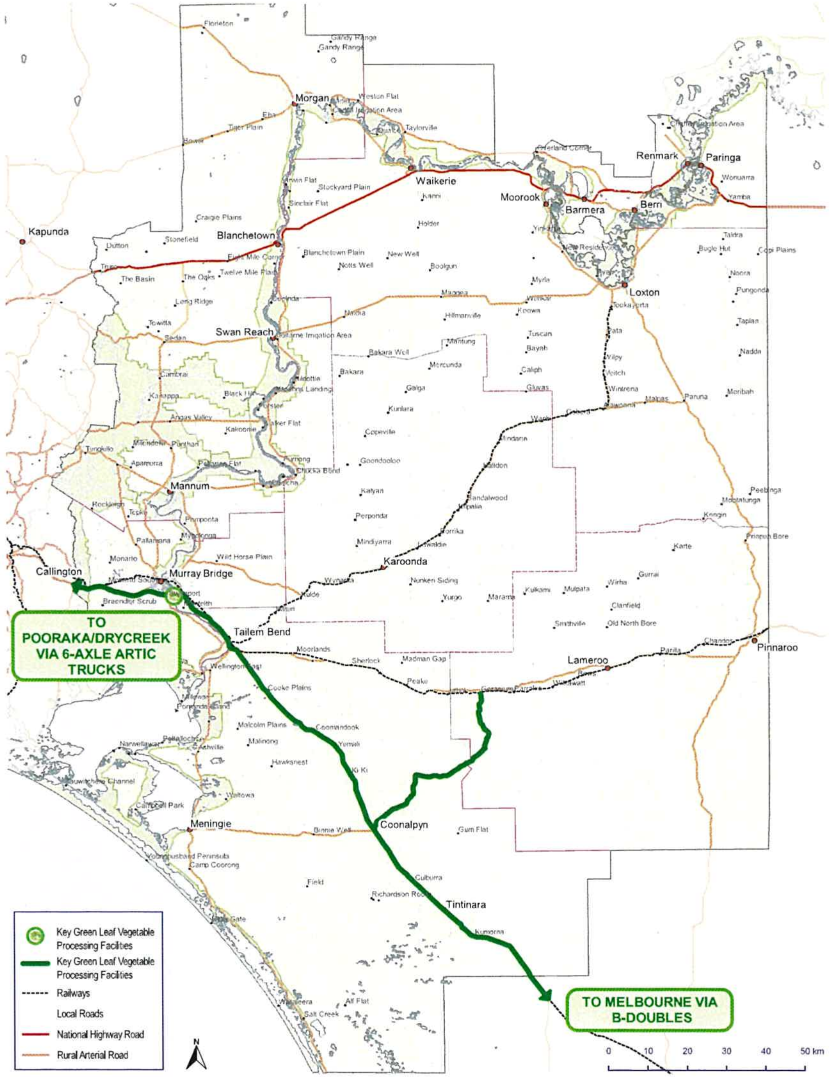
Annual Production Value
$8.72M

Seasonality
All year round

Key Transport Routes
South Eastern Freeway at Murray Bridge
Dukes Highway / Western Highway to Melbourne
Portrush Road (Arterial)
Grand Junction Road
Main North Road (to Pooraka)
Port Wakefield Road (to Dry Creek)

Key transport Issues
None identified

Key Transport Routes



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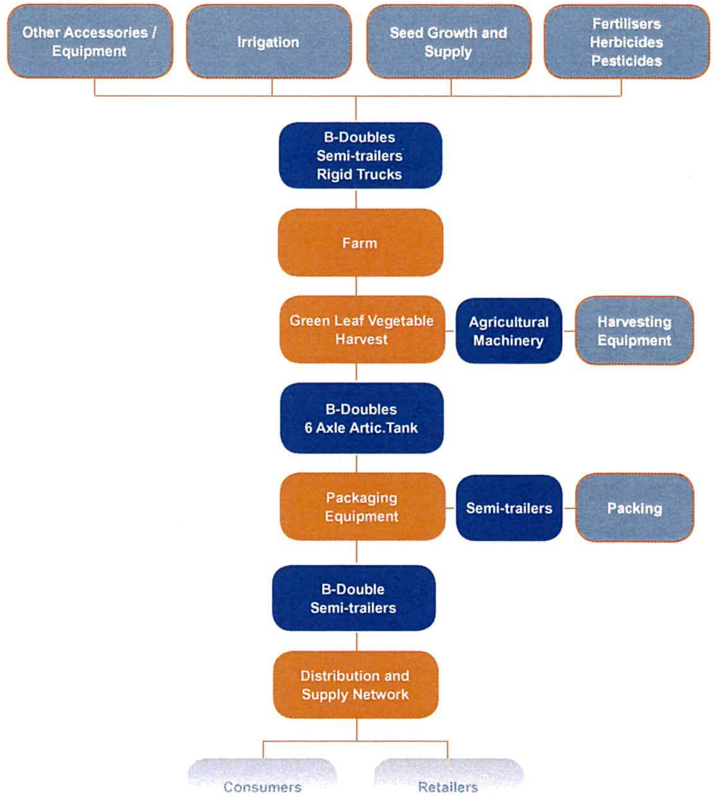


Hay

Annual Regional Production

Unknown

Annual Production Value

Unknown

Seasonality

October to December (related to grain harvest)

Key Transport Routes

Sturt Highway

Truro Road

Halfway Road

Ridley Road

Mannum Road

Princes Highway

Dukes Highway

Key transport Issues

Would benefit from having a BAB transfer station closer than Port Augusta for freight to Darwin

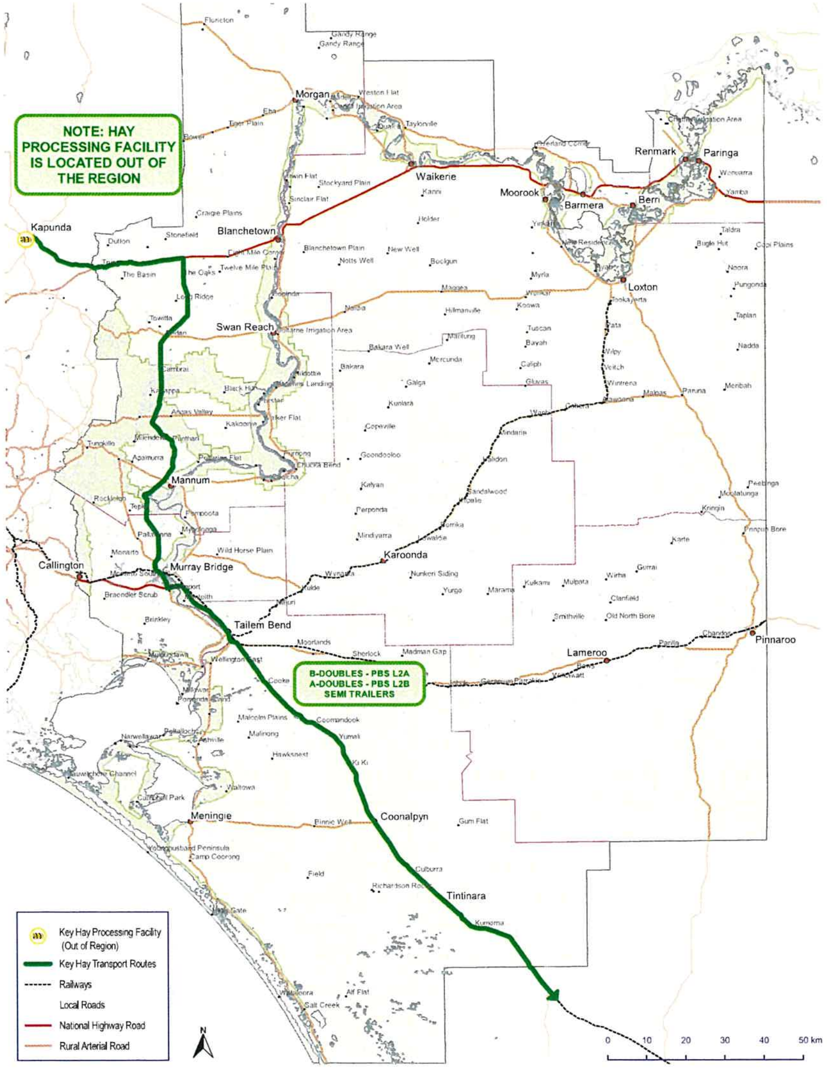
Use of B-Doubles and A-Doubles is preferred

Road condition in many regional areas is poor

B-Double access roads that don't link up affect efficient access to the hay processing facility

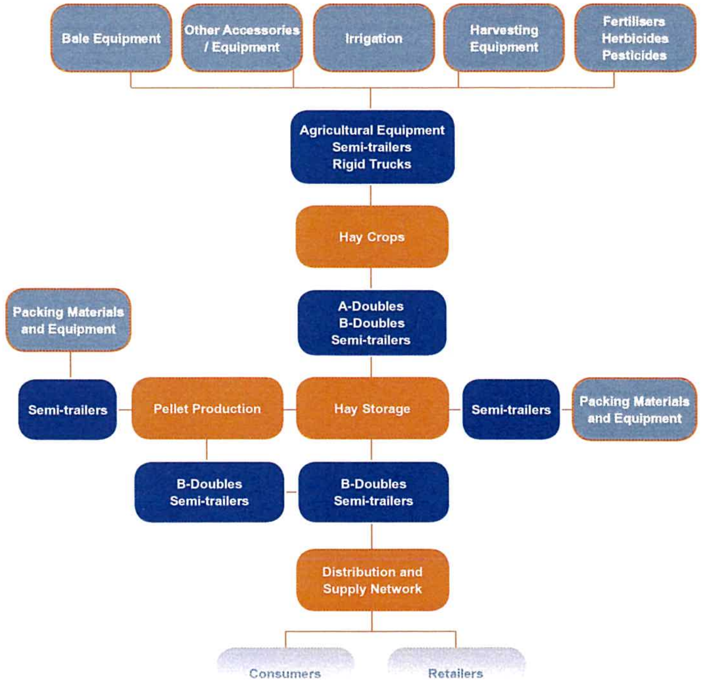
Last mile access issues in regions where farmers are forced to drive additional km's as B-Double routes do not link up

Key Transport Routes



Note: Hay Processing Facility is located out of the region (at Kapunda).

Supply Chain



Livestock

Annual Regional Production

63,680t

Annual Production Value

$364.5M

Seasonality

All year round

Key Transport Routes

Port Wakefield Road, Portrush Road, South Eastern Freeway, Reedy Creek Road, Randell Road, Terlinga Road, Mount Torrens Road, Frick Street, Dukes Highway Princess Highway, Lagoon Road, Murray Bridge

From Riverland through Loxton and Karoonda to Murray Bridge (abattoir), or Tailem Bend and then either east (towards Naracoorte, Bordertown and Victoria) or west (towards Adelaide)

From Riverland through Pinnaroo to Lameroo to Murray Bridge (abattoir), or Tailem Bend and then east or west

National Highway (M1), National Highway (A17), South Road (A13) and South Road Motorway

Murray Bridge to Melbourne, National Highway (A1) – Western Highway

Key transport Issues

Desire for blanket access for RAV's while travelling in out of district areas, and higher mass limits be available for all RAV's travelling on local Council roads

Consider establishing 44m AB Triple routes – possibly by permit

Sealing of the Strzelecki Track will open up livestock movement from SE QLD

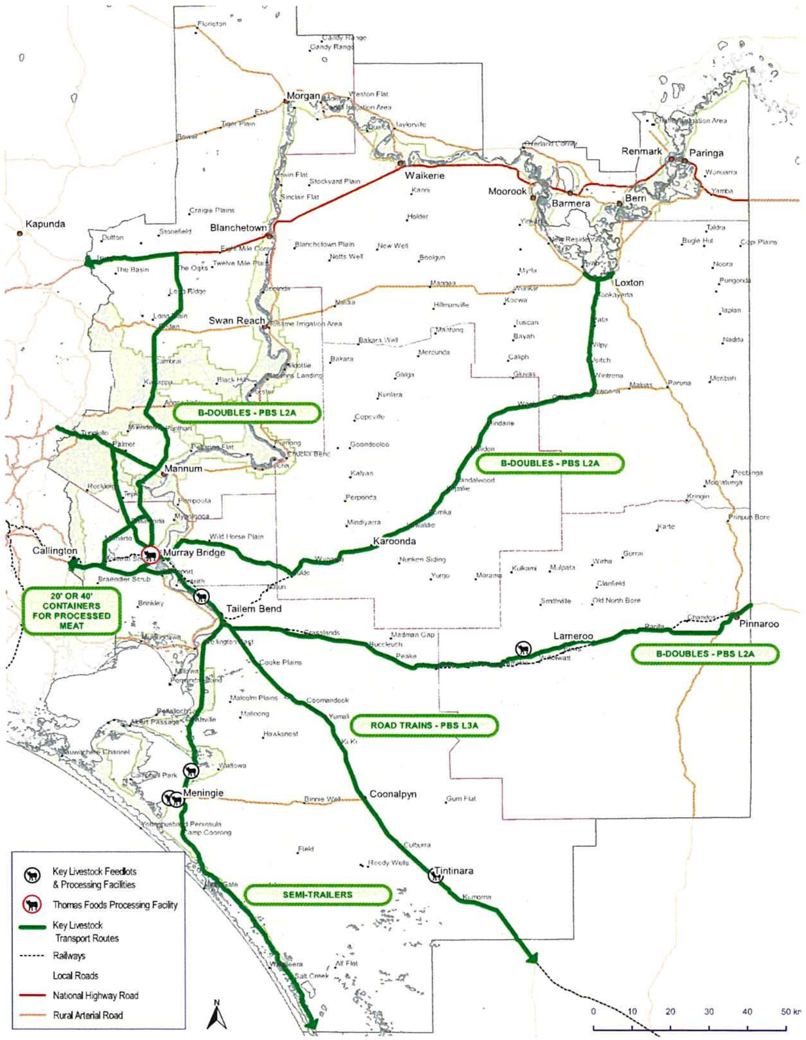
Allow 27m long B-Doubles from the WA border to deliver livestock into SA to key facilities

Develop a 3A network for modular 35m B-Triple route from Pt Pirie – Murray Bridge, connecting on to Dukes Highway and then the Victorian border (to allow livestock to travel from the far north to South Australia's largest abattoir and connect Perth to Melbourne for general freight)

B-Double access from the freeway into Lobethal, which would solve a long-standing 'last mile' issue

Difficulty with first and last mile issues, particularly unsealed road from farm gate to the nearest sealed road

Key Transport Routes



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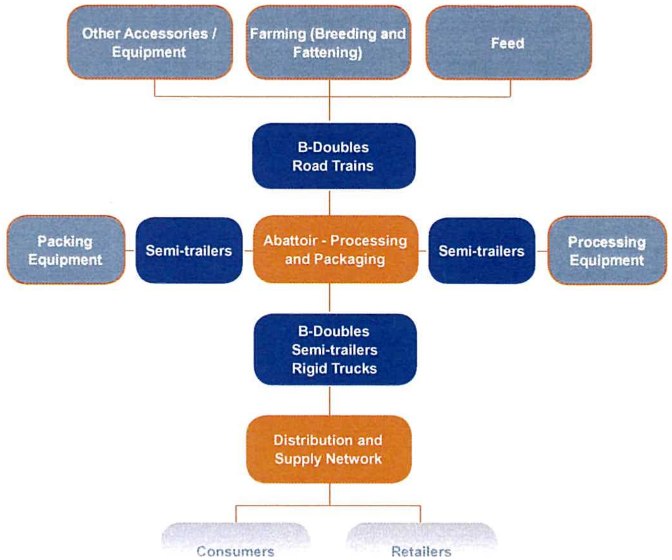


Mushrooms

Annual Regional Production

>6,000t

Annual Production Value

$33.2M

Seasonality

All year round

Key Transport Routes

South Eastern Freeway (Monarto to Pooraka, Gepps Cross, Burton, Regency Park)

Monarto to Mulgrave, Victoria

Monarto to Truganina (Laverton), Victoria

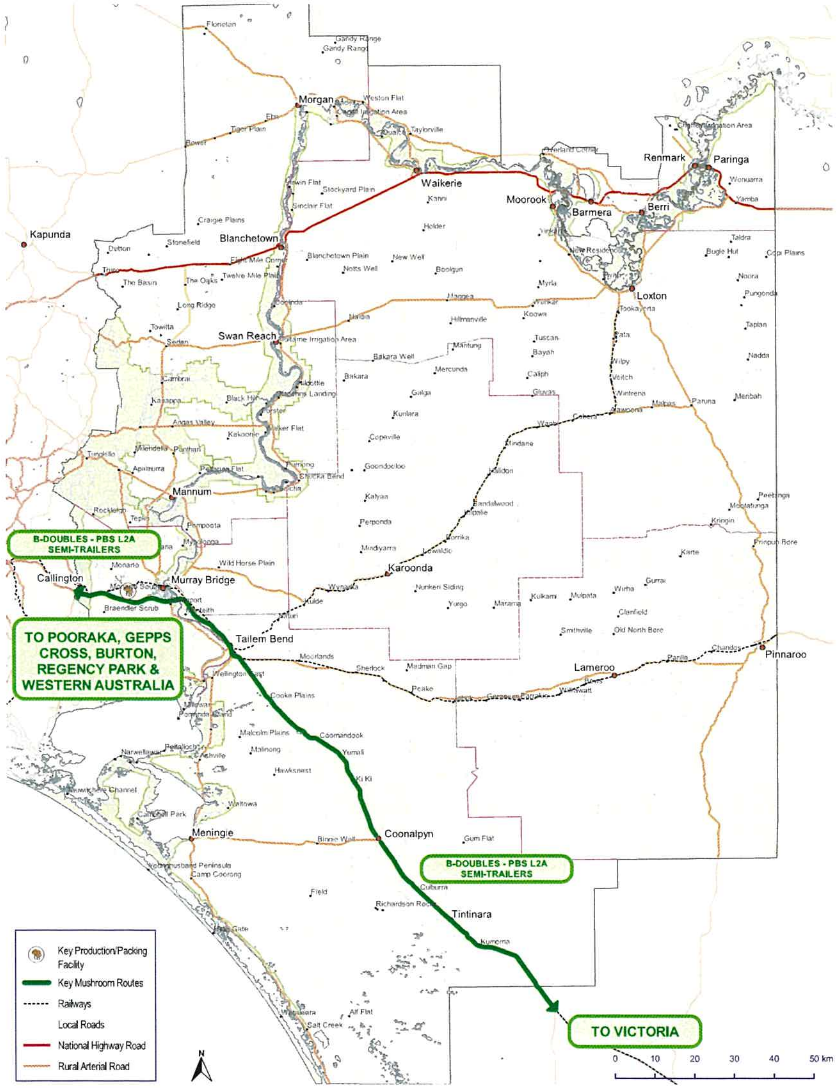
Monarto to Kewdale, Western Australia

Monarto to Jandakot, Western Australia

Key transport Issues

There is concern with the time it takes for trucks to travel up and down the South Eastern Freeway (at the top of the Freeway going into Adelaide and Portrush Road), and the costs incurred by the extent of travel time. A different, faster route into Adelaide would provide greater freight efficiency

Key Transport Routes



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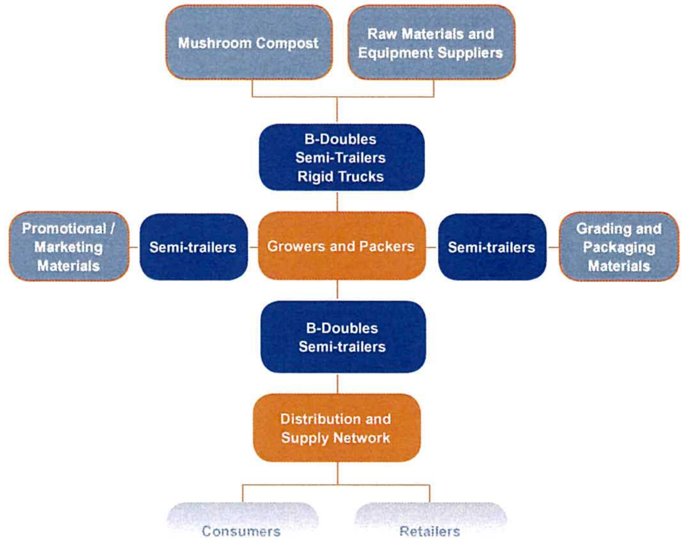


Olives

Annual Regional Production

5,380t

Annual Production Value

$3.1M

Seasonality

April-June

Key Transport Routes

Dukes Highway

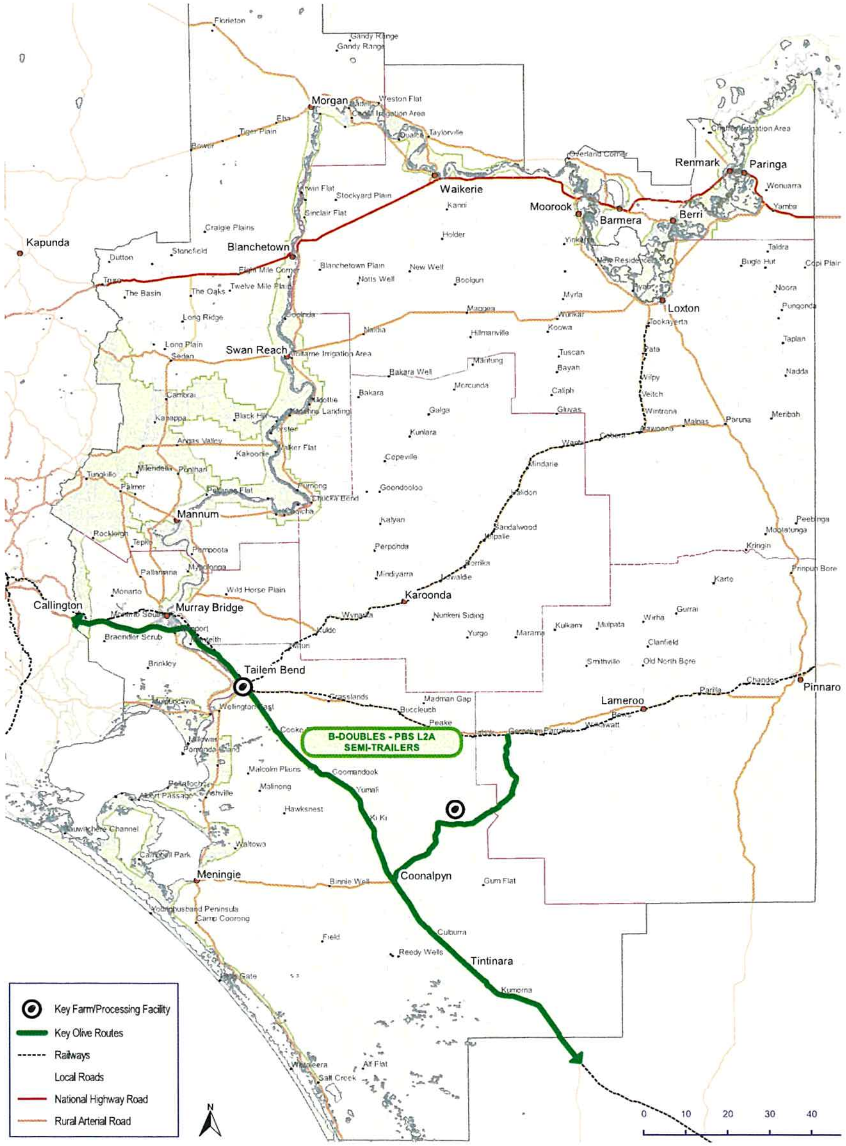
Princes Highway

Tauragat Well Road

Key transport Issues

None identified

Key Transport Routes



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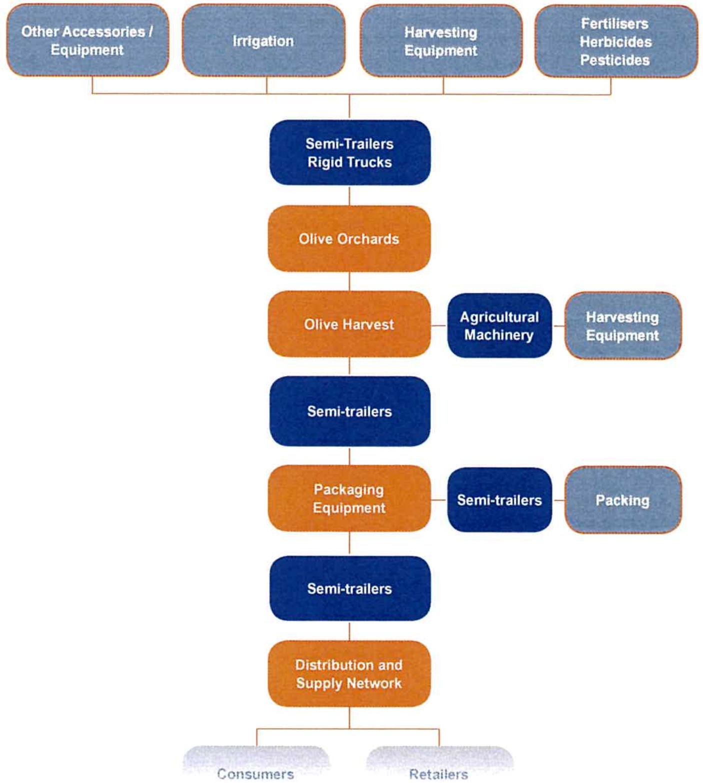


Pork

Annual Regional Production
624,000 head

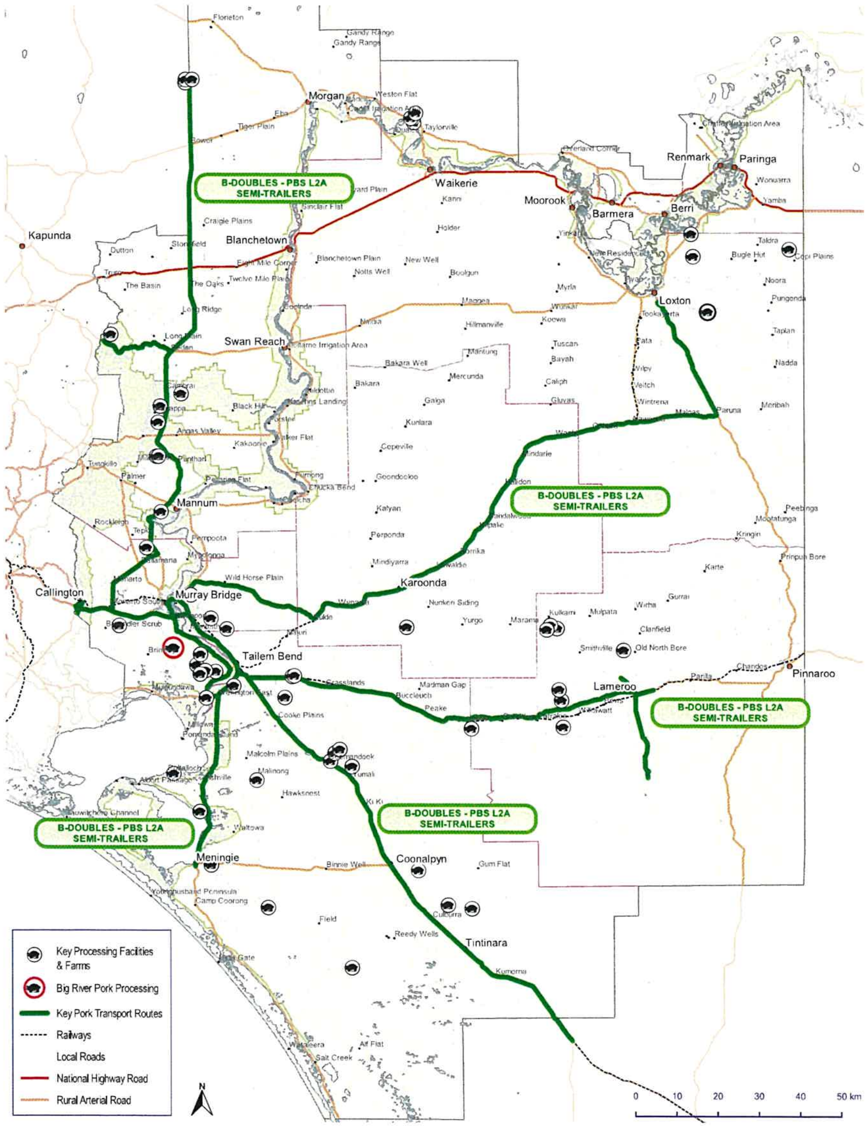
Annual Production Value
$144M

Seasonality
All year round

Key Transport Routes
Kulkami Road
Flagstaff Road
Princes Highway
Jervois Road
Mallee Highway
Dukes Highway
Karoonda Highway
Femes McDonald Road
Pallamanna Road
Wagenknecht Road
Mannum Road
Ridley Road
Bower Boundary Road

Key transport Issues
Kulkami Road becoming busier - requires widening and edge repair

Key Transport Routes



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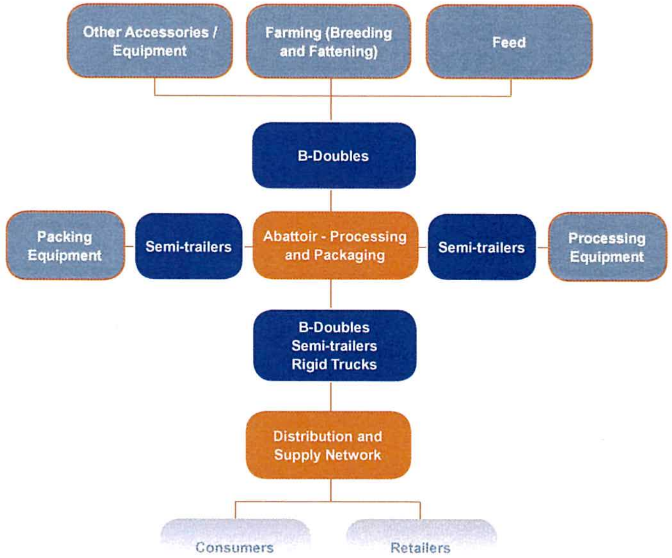


Poultry

Annual Regional Production
60,000,000 birds

Annual Production Value
$152.4M

Seasonality
All year round

Key Transport Routes
Sturt Highway

Dukes Highway

South East Freeway

Murray Bridge – Mannum – Blanchetown corridor

Various routes used for transfer of eggs from Yumali and Hamley Bridge to Monarto (e.g. Adelaide and South Eastern Freeway, Sturt Highway to Sedan / Monarto or Williamstown / Mount Pleasant to Pallamanna Road and Monarto or Kersbrook / Lobethal / Woodside to Monarto)

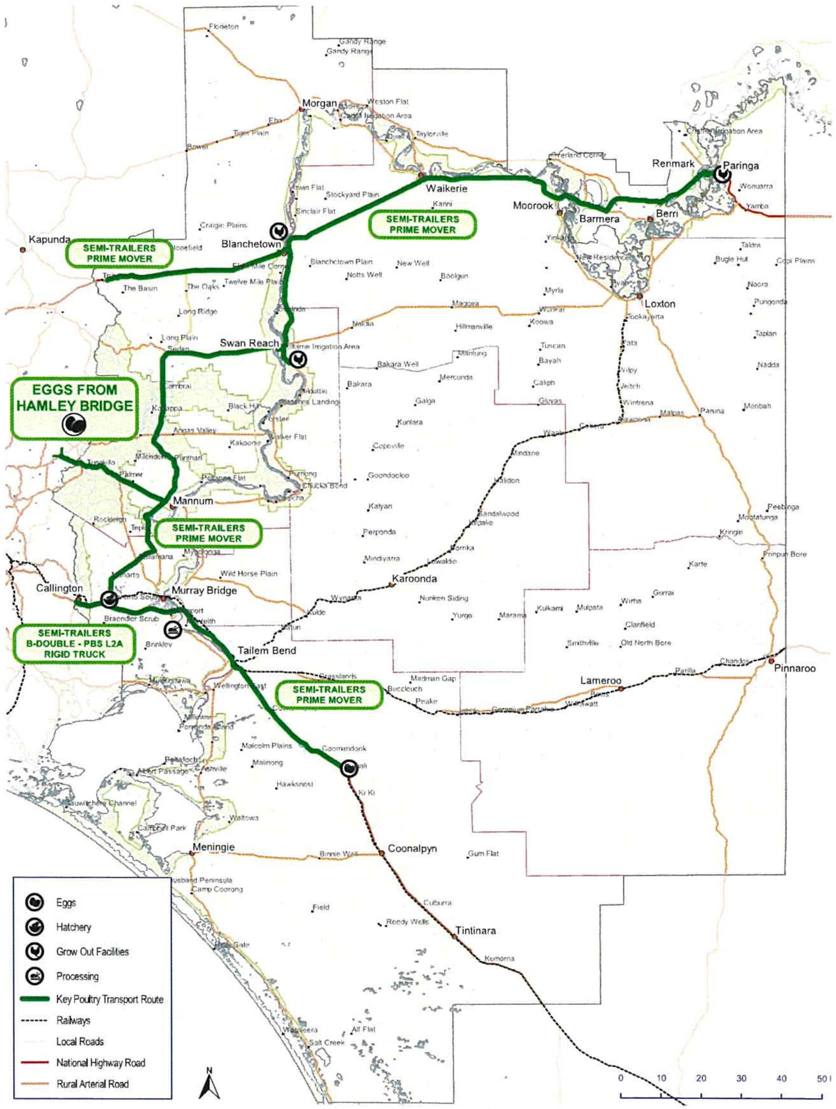
Delivery to farms uses local roads (i.e. first and last mile issues)

Major routes are used wherever possible

Key transport Issues
First and last mile issues for farms and larger and heavier vehicles, particularly in the pickup of chickens from farms for delivery to Bolivar for processing

Similar issues for the collection of juvenile chickens from the hatchery at Monarto for delivery to chicken farms

Key Transport Routes



Supply Chain

Root Vegetables

Annual Regional Production
254,300t

Annual Production Value
$84.3M

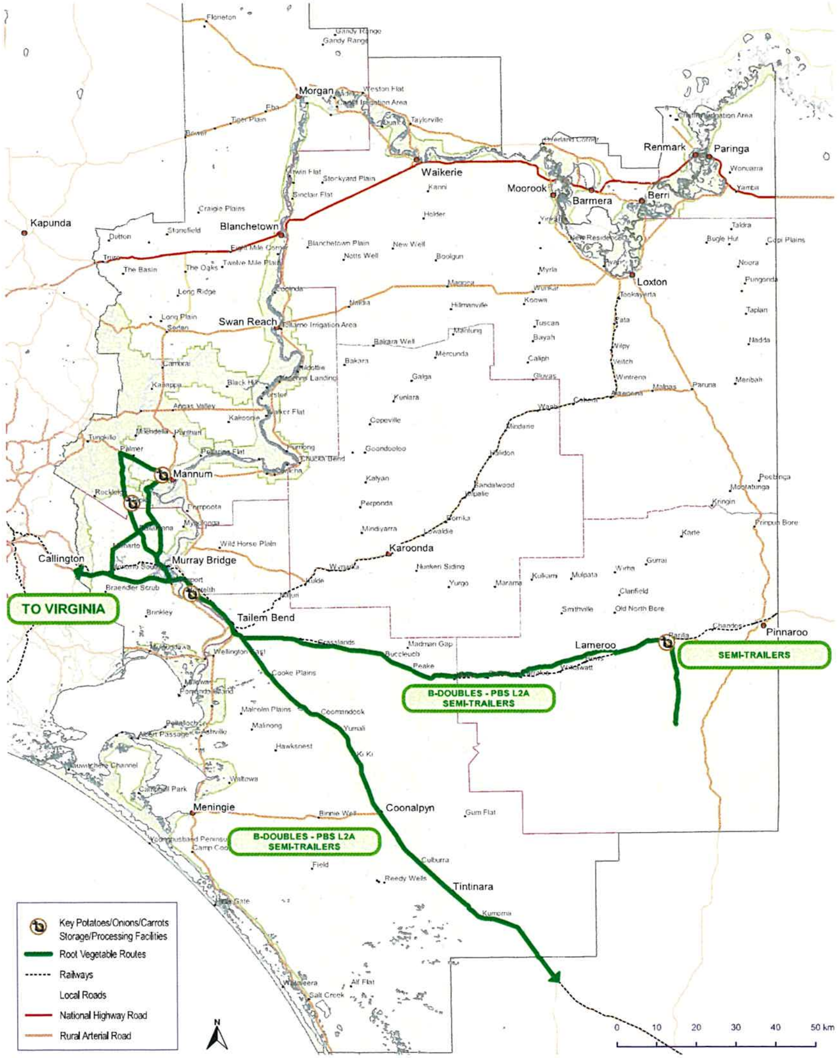
Seasonality
Potatoes are harvested in late summer, onions in late summer / autumn

Parilla Potatoes and RivaPak collectively process 150,000t product per annum

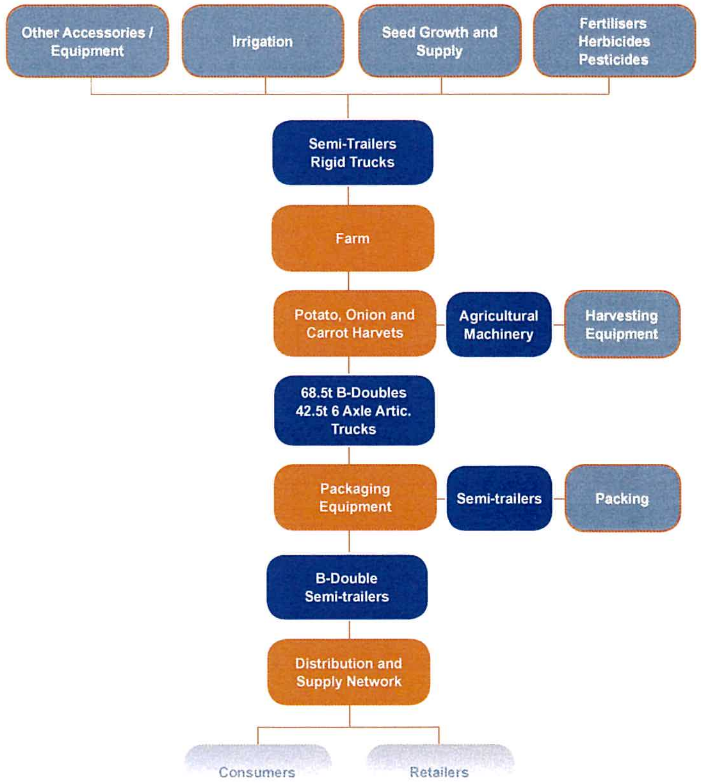
Key Transport Routes
Mallee Highway
Dukes Highway
South Eastern Freeway
Portrush Road (Arterial)
Ascot Avenue, Marden (Arterial)
Grand Junction Road
Port Wakefield Road (National Highway)
Angle Vale Road (Arterial Road)
Johns Road, Virginia
Princes Highway, Murray Bridge
Patricks Road, Mannum

Key transport Issues
There is some frustration with the inability of the local road network to be able to accommodate B-Doubles, particularly Parilla South Road

Key Transport Routes



Supply Chain



Organic Materials and Waste

Annual Regional Production

Not quantified

Seasonality

All year round

Key Transport Routes

Adelaide to Dublin, Brinkley to Murray Bridge, Brinkley to Riverland, Dublin to Adelaide, Dublin to Barossa, Willunga to Adelaide, Willunga to Brinkley

Mannum depot, across Mid-Murray region, Cambrai landfill site, and then back to the Mannum depot

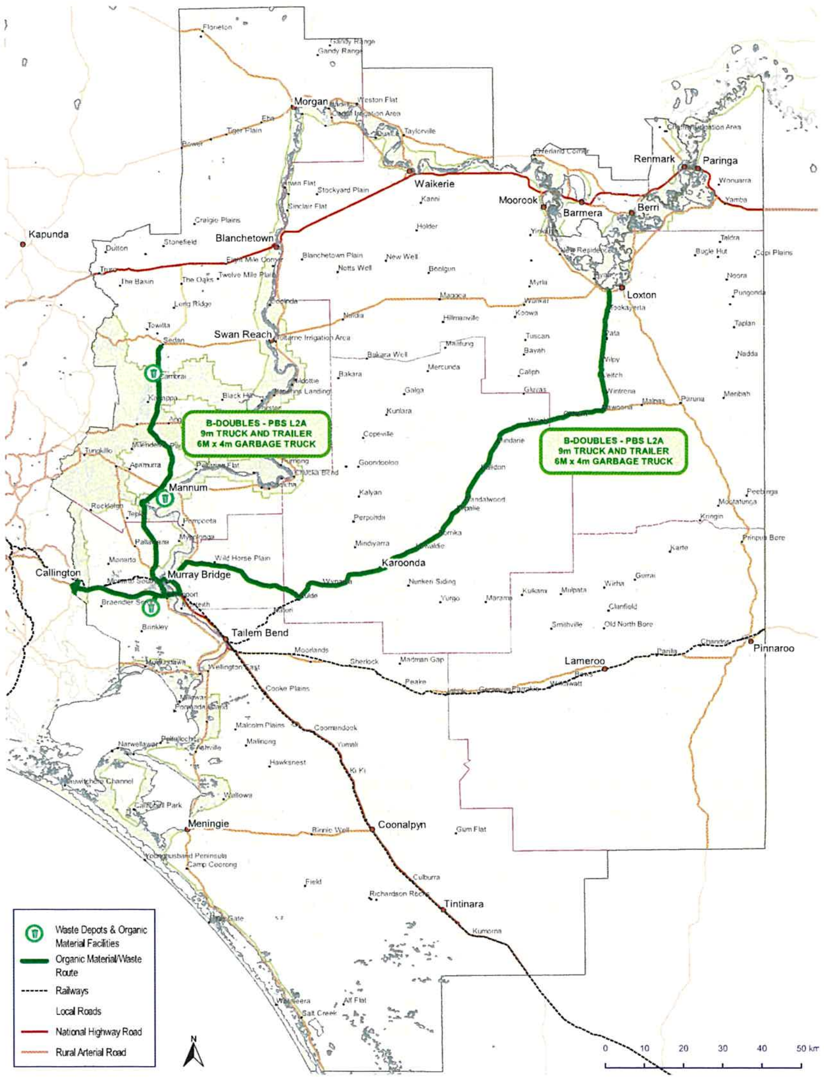
Key transport Issues

Mallee and Riddoch Highways - poor condition

Need for a coordinated transport network for efficient commodity movement

Unsealed roads cause increased repair and maintenance costs for vehicles

Key Transport Routes



Wine Grapes

Annual Regional Production

456,000t

Annual Production Value

$296M

Seasonality

Harvest occurs between January and April, beginning in the Riverland and heading progressively south

Key Transport Routes

Sturt Highway (National Highway)

Berri-Loxton Road (Arterial)

Old Sturt Highway (Arterial)

Northern Expressway (National Highway)

Port Wakefield Road (National Highway)

Port River Expressway – to Outer Harbour (National Highway)

Loxton – Moorook Road (Arterial Road)

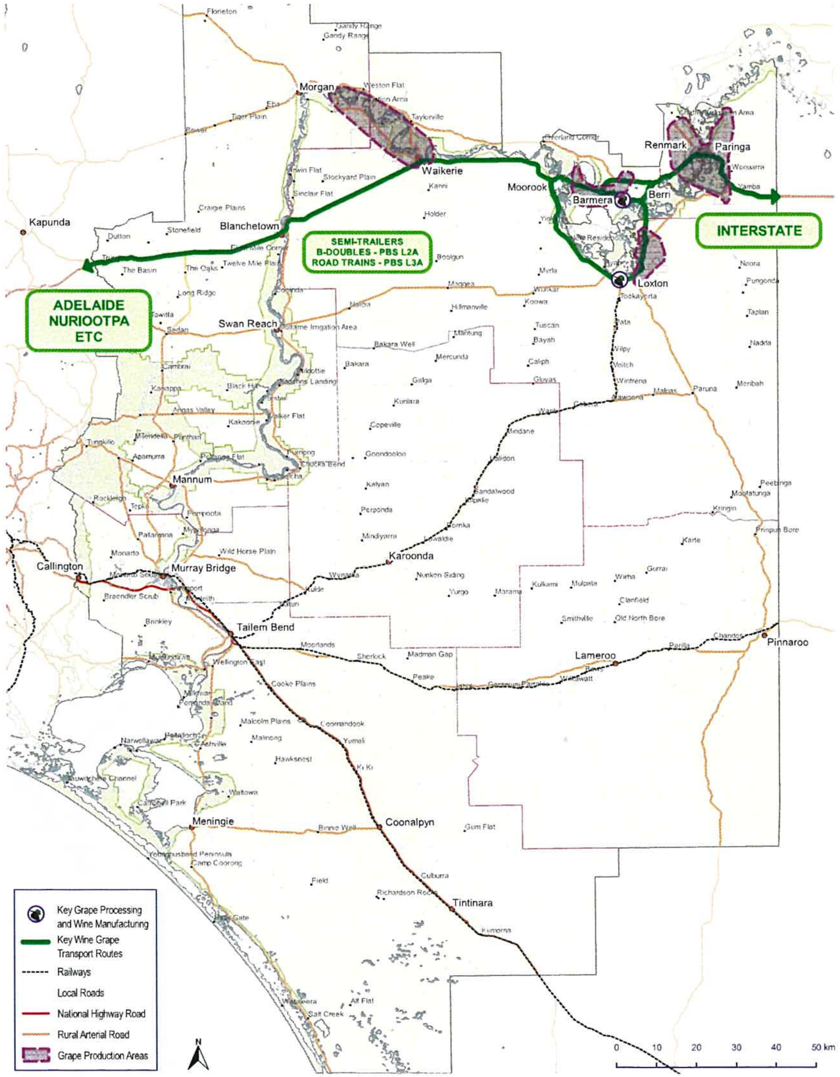
Key transport Issues

In time, B-Triples or Road Trains (A-Double) may become desirable for product movement

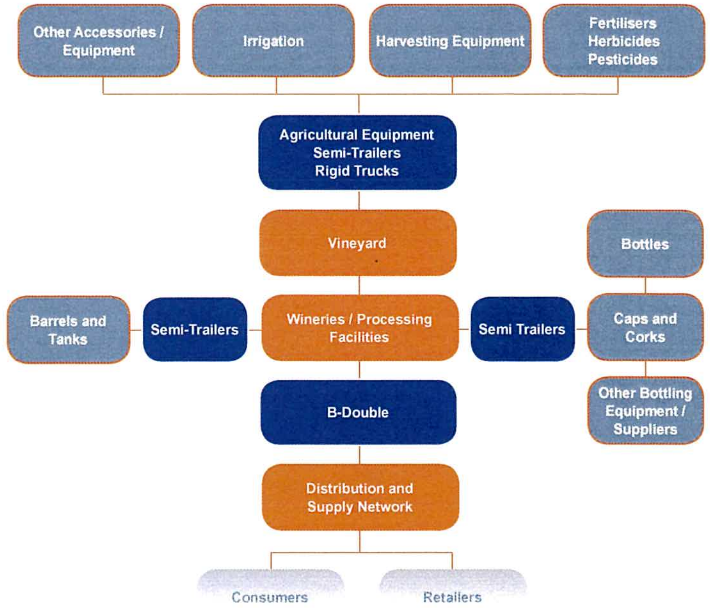
A new bottling facility at Berri will reduce B-Double movements to the Barossa, but will increase transport movement into and out of Berri

Bookmark Creek Bridge and Paringa Bridge require upgrade

Key Transport Routes



Supply Chain



Appendix C

Major Truck Accidents Per Annum

Examining MAJOR Truck Accidents per annum

	Average Incidents pa	Average Insured trucks pa	Ave km p a	R100mK	R10k
Single Articulated	174	11855	71000	20.6	146
B-Double	79	6502	162606	7.5	121
B-Triple (HPV)	1	73	226204	4.4	(99) [1]
Road Train Type I	23	907	135600	18.9	(256) [1]
Road Train Type II	15	515	151461	19.3	(292) [1]
Quad Trailer	2	42	196286	26.5	nsv
Combined Articulated	294	19894	106800	13.8	148
Rigid Truck & Dog	17	2783	30386	7.9	61
Rigid Truck	50	17006	77034	9.6	29
Combined Rigid	67	19789	36946	9.1	34

Note 1. Less than 100 vehicles per annum

Appendix D

SAE J3016 Levels of Vehicle Automation

U.S. Department of Transportation's New Policy on Automated Vehicles Adopts SAE International's Levels of Automation for Defining Driving Automation in On-Road Motor Vehicles

WARRENDALE, Pa., Sept. 22, 2016 - The U.S. Department of Transportation (DoT) now uses SAE International's six levels of automation for on-road motor vehicles in its just-released "Federal Automated Vehicles Policy."

The policy was issued, in part, to speed the delivery of an initial regulatory framework and best practices to guide manufacturers and other entities in the safe design, development, testing, and deployment of highly automated vehicles (HAVs).

"SAE International is proud to be a critical part of the process leading to deployment of self-driving vehicle technology. Top automotive experts from all around the globe developed an SAE standard J3016™ - classification of driving automation levels in on-road motor vehicles," David L. Schutt, PhD, Chief Executive Officer of SAE International, said. "By adopting this standard into the NHTSA Federal Policy for safe testing and deployment of automated vehicles, SAE J3016™ becomes the core reference and a guideline for all stakeholders in this transformational technology."

SAE International's standard provides and defines the six levels of driving automation, from no automation to full automation. Consistent with industry practices, the standard helps to eliminate confusion by providing clarity and is frequently cited and referred to by industry and media.

In general, SAE J3016™ levels and definitions include:

- Level 0 – No Automation: The full-time performance by the human driver of all aspects of the dynamic driving task, even when enhanced by warning or intervention systems
- Level 1 – Driver Assistance: The driving mode-specific execution by a driver assistance system of either steering or acceleration/deceleration using information about the driving environment and with the expectation that the human driver performs all remaining aspects of the dynamic driving task
- Level 2 – Partial Automation: The driving mode-specific execution by one or more driver assistance systems of both steering and acceleration/deceleration using information about the driving environment and with the expectation that the human driver performs all remaining aspects of the dynamic driving task
- Level 3 – Conditional Automation: The driving mode-specific performance by an Automated Driving System of all aspects of the dynamic driving task with the expectation that the human driver will respond appropriately to a request to intervene
- Level 4 – High Automation: The driving mode-specific performance by an Automated Driving System of all aspects of the dynamic driving task, even if a human driver does not respond appropriately to a request to intervene
- Level 5 – Full Automation: The full-time performance by an Automated Driving System of all aspects of the dynamic driving task under all roadway and environmental conditions that can be managed by a human driver

Jack Pokrzywa, Director of Ground Vehicle Standards for SAE International, said the work of developing such critical industry standards is ongoing for SAE. "Stay tuned as our technical committees continue work on an extensive portfolio of standards related to all levels of driving automation including full driving automation incorporating architecture and interfaces, interoperability, communication, and cyber security."

Barbara Wendling, sponsor of the J3016™ *Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles* document and chair of the On Road Automated Driving Definitions task force, added that the diligent work of the committee members helped make the adoption by the U.S. DoT possible.

"We were very fortunate to have an outstanding task force membership that includes deep experts in law and regulation, as well as automated driving technology design and development," Wendling said.

The levels referenced are outlined in SAE J3016™: Taxonomy and Definitions for Terms Related to On-Road Motor Vehicle Automated Driving Systems.

Recognizing the international importance of this standard, SAE International will offer the upcoming revised edition of J3016™ license free to enable wide adoption by global, regional, and local legislatures to expedite deployment of self-driving technologies.

Media may request a review copy of the standard by emailing pr@sae.org or calling 1-724-772-8522.

SAE International is a global association committed to being the ultimate knowledge source for the engineering profession. By uniting over 127,000 engineers and technical experts, we drive knowledge and expertise across a broad spectrum of industries. We act on two priorities: encouraging a lifetime of learning for mobility engineering professionals and setting the standards for industry engineering. We strive for a better world through the work of our philanthropic SAE Foundation, including programs like A World in Motion® and the Collegiate Design Series™.

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