Tasmania Regional Forestry Hub

Forestry Infrastructure Opportunities in Southern Tasmania

Final Report

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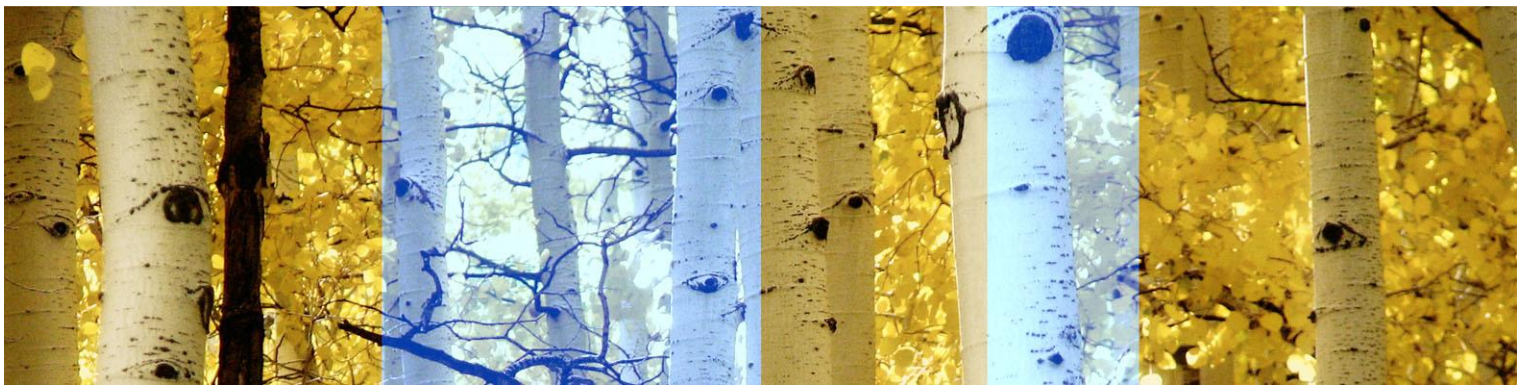

DISCLAIMER

Indufor makes its best effort to provide accurate and complete information while executing the assignment. Indufor assumes no liability or responsibility for any outcome of the assignment.

PREFACE

This report was prepared at the request of Tasmanian Forests and Forest Products Network Ltd (the Client) by Indufor Asia Pacific (Australia) Pty Ltd. The intended user of this report is the Client. No other third party shall have any right to use or rely upon the report for any purpose.

This report may only be used for the purpose for which it was prepared and its use is restricted to consideration of its entire contents. The conclusions presented are subject to the assumptions and limiting conditions noted within.

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EXECUTIVE SUMMARY

Southern Tasmania has a long history in forest management and timber production, supporting communities and economic activity across the region. A diverse range of wood processing facilities occur across the region, and infrastructure in the form of road, rail and ports all support the current competitiveness and innovative approach of the sector.

Indufor Asia Pacific (Australia) Pty Ltd (Indufor) was engaged by the Tasmania Regional Forestry Hub (the Hub) to undertake a detailed assessment of the infrastructure priorities for the development of the southern Tasmanian forestry industry.

Hobart Port

Centrally located to the southern Tasmanian forest resources, Hobart Port is a critical part of the forest industry's supply chain. Hobart Port is a core component underpinning the forest industry's viability, with exports being a significant source of industry revenue.

Figure ES-1: Aerial View of Hobart Port Log Storage Area at Macquarie Wharf

Source: ABC News – image supplied to the ABC by TasPorts

Northern Road Access to Hobart Port

The provision of a northern road access to Hobart Port would ensure that the Port continues to be central to industry operations. Northern road access would also facilitate trade in the forestry sector providing co-benefits to a range of other sectors, including tourism, heritage and Antarctic expedition programs. An additional benefit would be a reduction of heavy vehicle movements through Hobart's waterfront precinct.

Impact of Cessation of Log Exports Through Hobart Port

This report also assessed the impact to the sector in the event of a cessation of log exports through Hobart Port, which is summarised in Table ES-1. A decrease in log exports would have a significant flow-on impact in that due to low stumpages being received, growers would be very unlikely to replant once the existing plantations are harvested. A decline in the level of plantation re-establishment would result in a net loss of forest area for Tasmania and therefore correspond to a potential increase in carbon emissions.

Table ES-1: Potential Impacts with Cessation of Log Exports Through Hobart Port

Operations	Employment Impact	Economic Impact on a Net Present Value Basis
Forestry estates	Loss of 75 direct jobs and 36 indirect jobs (post 2028) in the forest management, harvesting and transport sector	Declining southern Tasmanian plantation estate due to low likelihood of replanting resulting in: • A net decrease in the value of sales from 2028 of $195 million • An overall reduction in forest asset values in southern Tasmania by up to $35 – $40 million
Harvesting and haulage		Haulage industry pre-2027 increased revenue of $35 million due to transport to Bell Bay rather than Hobart Port more than offset by post-2028: • $43 million loss to the harvesting industry • $35 million loss to the haulage industry Collectively this results in an overall net loss to the forest industry of $43 million over a 30 year timeframe
Domestic processing	Unknown from increased volume of local processing of 102 000 tonnes of pulpwood	Value-add from the processing of 102 000 tonnes of pulpwood
Regional impact	Loss in forestry employment ranging from 8% to 72% depending on the LGA (post 2028)	The regional impact is the loss of output from the forestry estates and the loss of harvesting and haulage post-2028, partially compensated by the pre-2027 gain for additional haulage to Bell Bay
Port operations	Loss of 25 direct jobs in Hobart (with some transfer to northern Tasmania)	Pre-2027 port costs are neutral with operations occurring via Bell Bay rather than Hobart Port Post 2028 lower harvest volumes result in a net loss of income of $36 million

Infrastructure Opportunities

The report also considered short, medium and long term infrastructure opportunities for the forestry sector which are summarised in Table ES-2. The following findings recognise that ongoing infrastructure enhancements are critical to maintain a viable industry.

Table ES-2: Summary of Infrastructure Requirements in Southern Tasmania

Short Term (1-5 years)	Medium Term (5-15 years)	Long Term (15-30 years)
Hobart Port • Development of planning and design of northern road access route to Macquarie Wharf • Re-instatement of structural integrity of Macquarie Wharf • Government commitment to long term commercial use of Macquarie Wharf **Rail** • Preparation of a business case for the purchase of additional container wagons to increase rail capacity and delivery options for industry • Development of hard infrastructure required for a log processing hub as part of the Brighton railhead arrangements • Confirmation and implementation of management arrangements for log processing facilities **Road** • Preparation of the business cases and implementation plans for the priority road infrastructure investments identified in Section 5 • Further investigation into changes to improve the truck permitting system	**Hobart Port** • Complete arrangements for the northern access road arrangements and commission the new access route • Maintain forest products trade and explore further complimentary product trade **Wood processing hubs** • Explore potential for establishing new wood processing facilities within footprints of existing wood processing, recognising the benefit of processing within the general Brighton/Derwent Valley given proximity to forest resources and existing infrastructure **Road** • Ongoing investment in the preparation of the business cases and implementation plans for the priority road infrastructure **Rail** • Review of needs for further enhancements in rail infrastructure, including exploration of further siding developments and below track investments to maintain high service levels of the rail freight industry	**Road** • Ongoing investment in the priority road infrastructure investments identified in Section 5, along with other likely needs in respect to bridge replacements or strengthening, and responding to demographic preferences that result in the need to upgrade existing low use forest roads **Rail** • Further enhancements in rail infrastructure that maintain high service levels, including exploration of below track investments particularly bridges and floodways to minimise disruptions to rail services due to an expected increase in extreme climatic events

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1. INTRODUCTION

This section provides an overview of the project, the project objectives and our approach.

1.1 Background

The Tasmania Regional Forestry Hub (the Hub) was established in 2019 by the Tasmanian Forests and Forest Products Network and is funded by the Commonwealth Government as part of the National Forest Industries Plan (the Plan).

The Plan ambitiously aims to deliver a billion new trees over the next decade (including 400 000 hectares of new plantations nationally) to meet a projected fourfold increase in global demand for timber and wood fibre products by 2050. This translates to planting the right trees, at the right scale, in the right places.

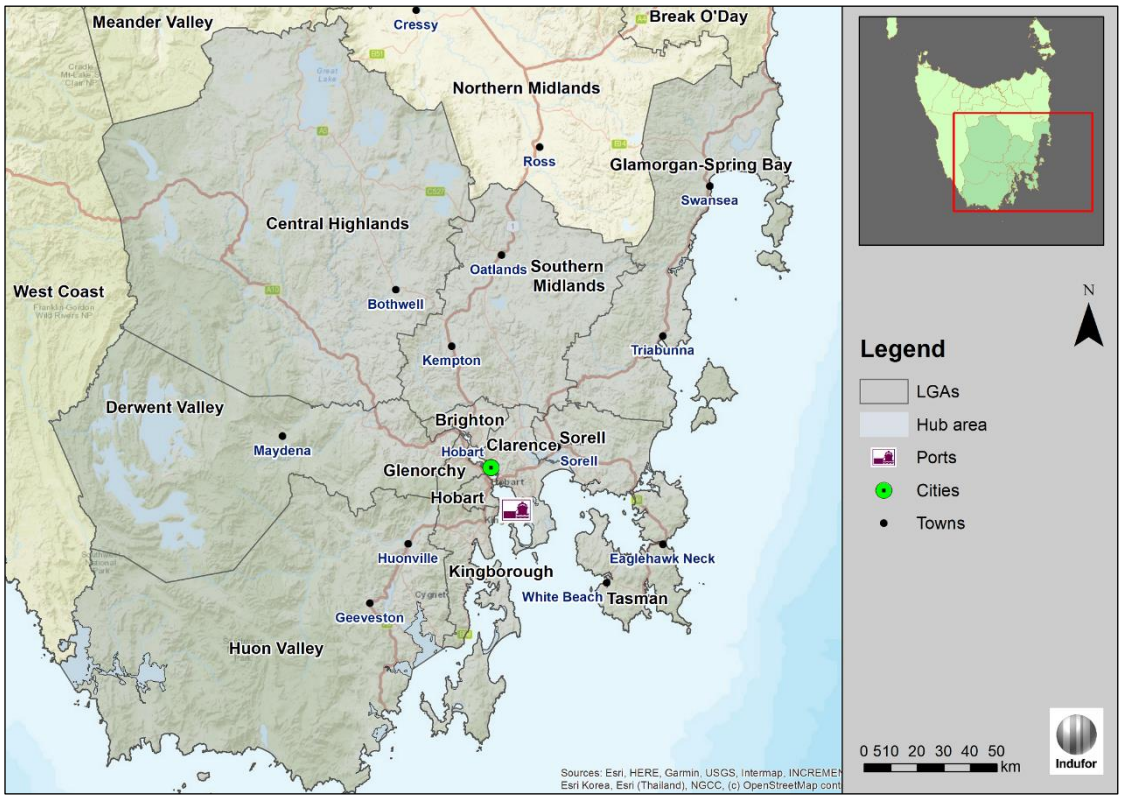
As part of pursuing this objective the Hub has identified two key project priorities:

- A review of infrastructure investment in southern Tasmania
- Ongoing access to Hobart Port for the export of forest products.

Infrastructure to be considered as part of the assessment includes road and rail infrastructure (including bridges), sea infrastructure, particularly Hobart Port as well as consideration of domestic freight opportunities.

Figure 1-1 shows the Local Government Areas (LGA) of interest within southern Tasmania.

Figure 1-1: Area of Interest for the Southern Infrastructure



Source: ESRI, Tasmanian Government Department of Primary Industries, Parks, Water and Environment (DPIPWE) - List spatial data, ABARES - spatial data, Indufor

Indufor Asia Pacific (Australia) Pty Ltd (Indufor) has been engaged by the Tasmania Regional Forestry Hub to undertake a detailed assessment of the relevant infrastructure priorities to determine: the technical issues, as well as the needs and opportunities for the progressive development of the forestry industry in southern Tasmania.

While the main area of interest is southern Tasmania, the nature of the wood product flows from the region means Tasmania is considered as an entire geographic region.

1.2 Indufor Approach

The first requirement of the project was a literature review to understand current policy and infrastructure investment settings and to identify previous or current commitments. The literature review considers documentation dating back to 2005.

The documents identified in the literature review are referenced in Section 7. As part of the assessment Indufor was also provided with several confidential documents. These documents were used to inform our analysis, but at the request of the companies that provided them, are not identified in the report.

To gain important local insights, Indufor engaged local engineering specialist Telopea Pty Ltd to assist with the literature review and to assess the level of investment required to undertake the infrastructure investment priorities identified in the report.

Indufor also engaged economists from Point Advisory to assist with the analysis of the economic benefits of transporting forest products through Hobart Port.

The results from the literature review and analysis of historical data formed the basis for consulting with industry on the current status of infrastructure investment and key priorities from a company or government perspective. The consultation included forest growers, processors, transport and freight providers, exporters of forest products, state government (including Government Business Enterprises) and local government representatives.

Key topics discussed during the consultation process included:

- Current and future product flows for forest related raw materials and finished products
- Existing infrastructure utilisation including the identification of key constraints and bottlenecks
- Current levels of infrastructure investment and key future infrastructure investment costs and timeframes
- Opportunities for further infrastructure development that would alleviate existing constraints and improve the long-term viability of the forest sector in southern Tasmania. This feedback could be company specific or more broadly across the sector. Where opportunities are identified, the estimated cost and timeframe for implementation.

The findings from the consultation were supplemented with a desktop analysis of the state road network to identify gaps in the network that constrained opportunities to maximise truck payloads or overall truck costs. The areas of interest were then discussed further with industry to confirm the current status of these roads and identify potential priorities for further investment. The options were ranked using a multi criteria analysis to identify infrastructure investments that provided the greatest benefit to the forest sector.

Hobart Port is a critical part of the forest industry supply chain in southern Tasmania. The Hobart Port analysis involved an economic analysis quantifying the benefits of forest products moving through Hobart Port. The existing port infrastructure is approaching the end of its useful life.

The Tasmanian Government currently has a proposal before Infrastructure Australia seeking additional funding from the Federal Government for the upgrade of Hobart Port. As part of the analysis of Hobart Port Indufor developed a scenario of the impact to industry should Hobart Port not be available to the forest industry. The purpose of the scenario analysis is to highlight the benefit associated with maintaining ongoing port access.

As per the scope, the analysis considers not only the current level of activity within the forest sector, but also its future potential to take additional forest products over time.

Section 1 of this report contains an overview of the project. Section 2 provides a summary of forestry in Tasmania and southern Tasmania's forest resources compared to other regions. This discussion also identifies the range of forest products produced in the region as well as existing processing and export infrastructure.

Section 3 contains a summary of the various levels of ownership of infrastructure resources. This provides a current snapshot of road, rail and port infrastructure and well as the movement of forest products within Tasmania.

Section 4 contains an assessment of the economic importance of Hobart Port to the forest sector. The analysis considers two scenarios: a business-as-usual approach and a scenario that considers the impact on the forest sector should Hobart Port not be available for exporting forest products from the south of Tasmania. The analysis takes into account industry structure, including legislated supply requirements and prior capital investment as well as existing infrastructure options. A wood flow was developed for the region to assess: the flow on economic effects to the forestry value chain; direct and indirect employment impacts and the impacts on forest estate values as well as the likelihood of replanting. The impact on value was taken from the perspective of the additional costs that would be incurred should the port not be available for exporting forest products.

Section 5 identifies existing infrastructure investment commitments as well as constraints and bottlenecks. It then reviews the opportunities for further infrastructure development in southern Tasmania. It assesses the pathways available to remove infrastructure constraints, where opportunities exist for realising cost efficiencies and further supply chain optimisation. Where possible the estimated cost to undertake these developments is also presented.

Section 6 provides a summary of the infrastructure investment opportunities for the forestry sector and Hobart Port over the next 30 years.

2. OVERVIEW OF THE TASMANIAN FOREST AND WOOD PRODUCTS SECTOR

This section provides an overview of the Tasmanian forest and processing sector and highlights the importance of southern Tasmania to the forest industry. It describes the suite of forest products produced from both native forests and plantations.

2.1 Forest Resource Ownership in Tasmania

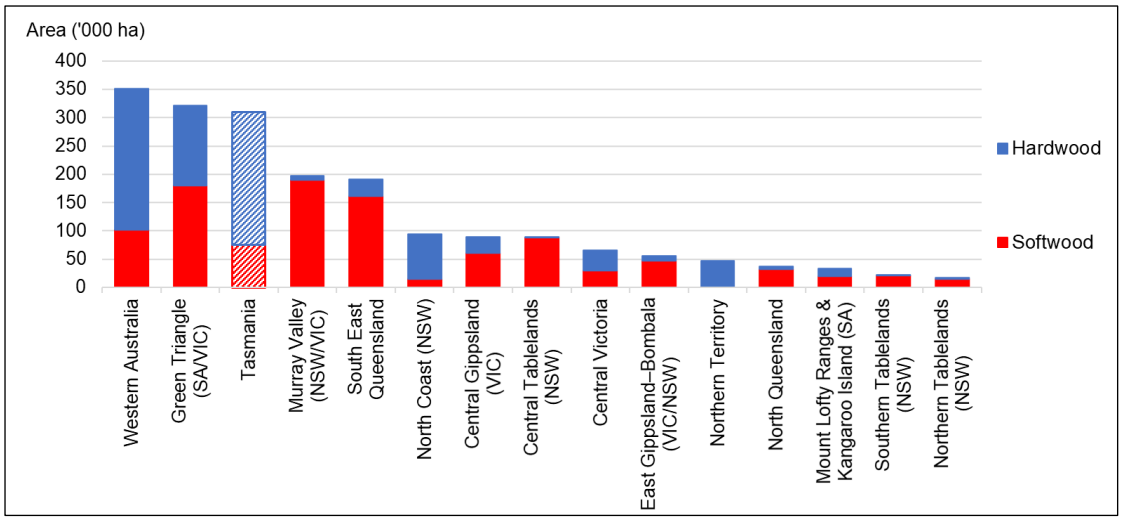
Commercial forestry has been a major part of the Tasmanian landscape since European settlement. The introduction of large scale softwood plantation expansion in the 1950s and 1960s and progressive development of hardwood plantations from the 1990s, has supplemented the fibre sourced from natural forests.

Public native forests are managed by Sustainable Timber Tasmania (STT) to allow STT to make available 137 000 m^3/year of high quality sawlogs to the local processing sector. STT manages a total native forest area of around 700 000 hectares (ha), of which around 52% is available for timber production. The remaining 48% is managed for conservation purposes (Sustainable Timber Tasmania 2019/20 Annual Report, 2021).

Tasmania also has a substantial private native forest resource. Ownership of this resource is highly fragmented with variable levels of management (Wilson & Tys, 2020). The report is based on a comprehensive spatial analysis of private native forest resources in Tasmania. The study identified private native forests comprised a total area of 842 000 ha with 92% (771 000ha) distributed across over 37 000 ha of freehold land holdings. Within this group only 12 000 ha of these properties own more than 5ha of native forest. The authors estimate around 322 000 ha is potentially available for harvest after taking into account legislative and operational factors. Of this area 67 000 ha is identified as a private timber reserve (PTR) which is private land to be managed for forestry purposes with this intent registered on the title.

Australia's plantation estate area is updated annually by the Department of Agriculture, Water and the Environment via the National Plantation Inventory (NPI). The NPI divides the national plantation resource into 15 growing regions. Tasmania is treated as a single region with a plantation area of over 300 000 ha, making Tasmania Australia's third largest plantation NPI region. Figure 2-1 shows the distribution of hardwood and softwood plantations by NPI region as at 2018/19. It shows 76% of Tasmania's plantations are hardwood species (predominantly *Eucalyptus nitens* and *E. globulus*) with the remaining 24% being softwood plantations which are almost exclusively *Pinus radiata*.

Figure 2-1: Distribution of the Australian Plantation Estate by NPI Region 2018/19

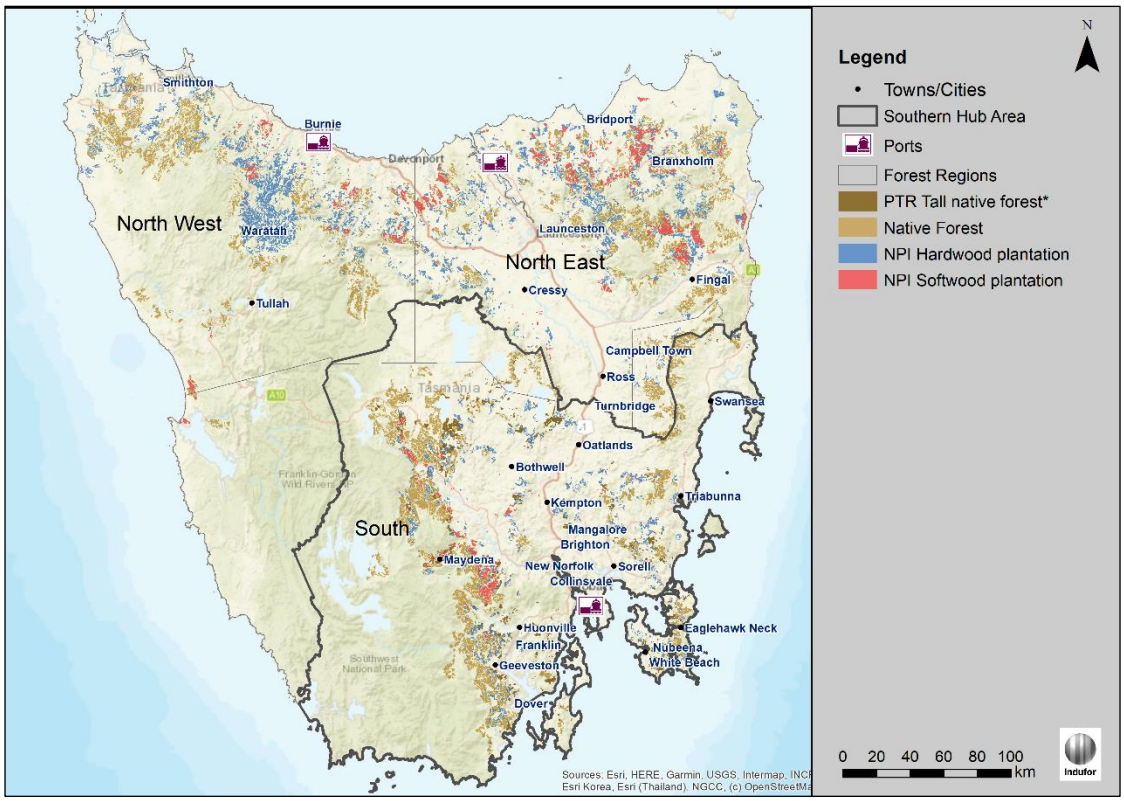


Source: ABARES

Figure 2-2 shows the distribution of Tasmania's forests that are managed for commercial timber production. The map is separated into three regions: north east, north west and south. The

southern region aligns with the Tasmania Regional Forestry Hub's area of interest for the infrastructure report.

Figure 2-2: Map of Tasmania's Forest Area Managed for Timber Production



Source: NPI, STT, PFT

Table 2-1 summarises the distribution of forests in Tasmania by geographic region. It shows native forests comprise the most substantial forest area within Tasmania.

Tasmania's softwood and hardwood plantations are dominated by corporate ownership which collectively accounts for 83% of the total plantation estate. Corporate ownership is dominated by investment funds that specialise in long term plantation ownership. STT also manages a significant hardwood plantation resource. Whilst plantations comprise around half the productive forest area, they account for approximately 78% of Tasmania's total roundwood production.

Table 2-1: Regional Distribution of Tasmanian Commercial Forest Resources

Forest Type	Forest Area (000 ha)			Total Area	Proportion
	North West	North East	South	(000 ha)	(%)
Public native forest	95	102	161	359	47%
Private native forest*	No data	No data	21	21	3%
Hardwood plantation	123	100	63	287	38%
Softwood plantation	19	55	21	94	12%
Total forest area	**238**	**257**	**265**	**761**	**100%**
Proportion (%)	**31%**	**34%**	**35%**	**100%**	

* Based on the area classified as 'Tall eucalypt forest' in areas designated as a private timber reserve within the south region

Source: STT 2019/20 Annual Report, ABARES, Private Forests Tasmania (Esk Mapping)

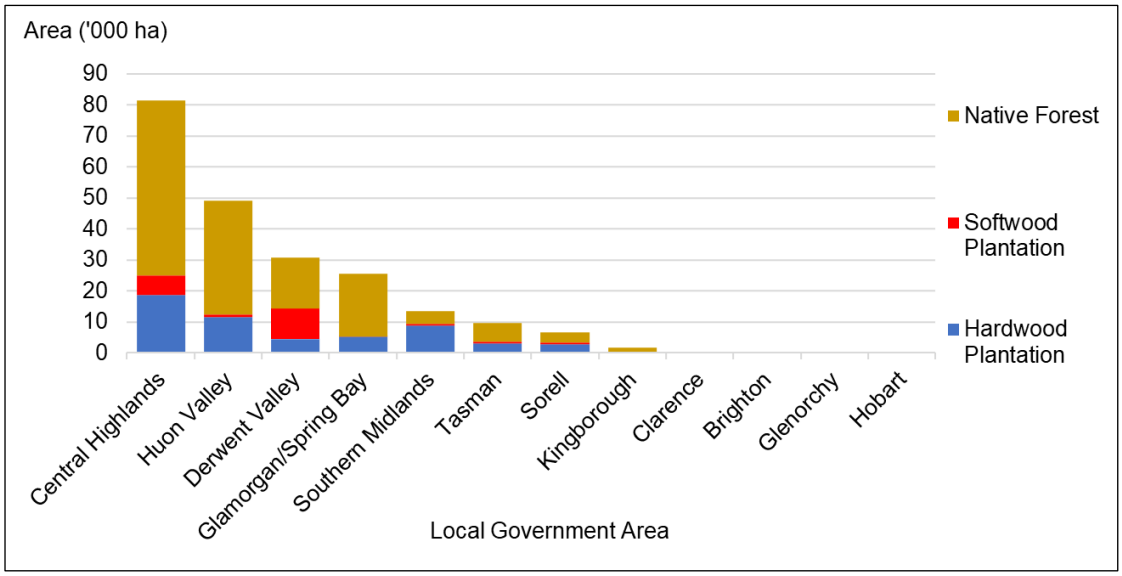
In terms of the regional distribution of Tasmania's plantations, Table 2-1 shows that while the bulk of the plantation resources are located in the north of the state, the south represents 35% of Tasmania's total commercial forest resource and 23% of the total plantation resource. The south also represents an important source of high quality sawlogs from the wet eucalypt forests in south west Tasmania.

Figure 2-3 shows the distribution of forests managed for timber production in southern Tasmania by Local Government Area (LGA). Key features include:

- Four LGA's (Central Highlands, Derwent Valley, Huon Valley and Glamorgan/Spring Bay) account for 85% of the total commercial forest area in southern Tasmania
- The Central Highlands LGA contains the largest forest area (39%) in total and for commercial native forests and hardwood plantations. It has the second largest area of softwood plantations
- The Huon Valley is the second largest area (21%) with mostly native forest as well as a significant area of hardwood plantation, mostly established on Crown land
- The Derwent Valley (13%) is the third largest area and has the largest softwood area.

The Southern Midlands and Glamorgan/Spring Bay regions are mostly a combination of native forest and hardwood plantations. The other regions comprise the remaining 15% of the commercial forest area.

Figure 2-3: Distribution of Commercial Forests in the South by Local Government Area



Source: NPI, STT

The distribution of these forest areas influences the corresponding wood flows and subsequent movement of forest products around the state.

2.2 Summary of Forest Product Outturn and Processing within Tasmania

Forests in Tasmania produce a range of log products suited to multiple end uses. This section summarises the main log types produced by each forest type, the key products produced and corresponding processing infrastructure.

Native Forests

Historically the forest sector in Tasmania relied on natural forests to produce a range of timber products. Native forests in Tasmania are managed over a rotation of 70 – 90 years to produce high quality sawlogs. These logs are typically round and straight with few defects such as rot or branch stubs and have a small end diameter (SED) in excess of 40 centimetres (cm). Like the commercial hardwood forest species of the Northern Hemisphere, only a minor proportion of the total tree volume is suitable for this end use.

As the native forest area available for timber production has declined, timber processing has consolidated to match the available resource. Most hardwood sawmills in Tasmania focus on value recovery and are small in scale relative to plantation processing operations which rely more on high volume throughput and economies of scale.

High quality sawlogs are sawn to produce a range of high quality timber products including: flooring, wooden furniture, mouldings, joinery and other appearance grade products that incorporate a structural element such as stair treads. They can also be peeled to produce high value face veneer (the exposed surface layer on appearance grade plywood). Sawn boards that do not meet high quality timber specifications are processed into a range of structural, non-structural and landscaping timber products. The majority of Tasmanian timber production is sold to the domestic Australian market.

The next most valuable log product is a peeler log which is also straight and round but can have a smaller SED (greater than 20 cm) and is utilised in shorter lengths than sawlogs. Peeler logs are peeled on a lathe to produce veneer sheets which are then laminated together to produce products such as plywood or laminated veneer lumber (LVL). High quality veneer sheets that have few defects are used as face veneer. Lower quality veneer that contains knot holes or other defects are used as core veneer.

Ta Ann Tasmania (TAT) operates a veneer and plywood mill located at Smithton utilising peeler logs sourced from native forests. Plywood is sold domestically and exported. Veneer sheets are also exported to Malaysia where they are used as a feedstock to produce plywood.

TAT also had a veneer mill at Southwood, but this was impacted by fire in early 2020 and a decision was made to subsequently close the mill. With a lack of alternative markets, these logs are currently being exported through Hobart Port.

The remainder of the merchantable stem is classified as pulpwood, which for Tasmanian eucalypt species is exported as woodchip. Pulpwood log specifications generally have few restrictions. The most material limitation is that no charcoal is permitted in export woodchips. Residues from timber and veneer processing are also chipped and exported to produce high quality hardwood pulp which is used to produce a range of paper and paperboard products.

All hardwood chip exports from Tasmania are from the northern Tasmanian ports at Bell Bay or Burnie.

Hardwood Plantations

Tasmania has the second largest hardwood plantation area in Australia. A substantial portion of the plantations were established between 2000 – 2010 primarily to produce pulpwood for international pulp and paper markets on a rotation of 12-18 years.

As Tasmania's hardwood plantation resource has matured over the past decade, hardwood chip exports from Tasmania have transitioned to be dominated by supply from hardwood plantations.

In recent years, new markets have emerged that utilise unpruned hardwood plantation logs. These logs are peeled to be used as core veneer in plywood which is used for end products such as container flooring. While these markets accept logs with a SED of 14 cm, there is a preference for peeler logs with a SED greater than 20cm. Until recently, the largest market for these logs was China. However, this trade is currently suspended due to the Chinese Government ban on Australian log imports.

In terms of maximising stem utilisation, China accepts a lower log quality which, because it is peeled, allows for the presence of some charcoal. This provides an important outlet for fire damaged material as evidenced from the sale of large volumes from salvage operations following the Riveaux Road fire in southern Tasmania in 2018/19. These fires impacted on an estimated 35 000 ha of commercial native forests and plantations mainly in the Huon Valley. Export woodchip markets have a zero tolerance to charcoal, so having a log export market option available provides an important alternative for growers.

Malaysia is another important log export market where a supply chain has been developed that focuses on plantation *E. nitens* logs. Peeler logs are primarily exported in bulk from Burnie, Bell Bay and Hobart Port.

STT manages a significant hardwood plantation estate of around 24 000 ha on a long rotation of 25+ years to produce high quality sawlogs that can substitute for supply from native forests. Much of the STT estate has been pruned and thinned to stimulate the production of clearwood (timber with no knots) that can be used for the same high value applications as native forest sawlogs. This estate is expected to be utilised at a large scale from 2027 onwards.

The maturing of the hardwood plantation resource is leading to increased interest by domestic hardwood processors in the potential to utilise this resource for solidwood applications. Utilisation of hardwood plantation sawlogs for sawn timber or veneer production is still at a trial stage with no large-scale processing occurring within Tasmania to date. One of the more advanced projects is CLTP Tasmania which is aiming to use plantation *E. nitens* to produce cross laminated timber (CLT), a laminated panel product that can substitute for steel and concrete in low to mid rise construction.

There has also been an increase in plantation derived firewood in Tasmania. Indufor understands around one million tonnes of firewood is burnt per annum in Tasmania. As stricter controls over native forest logging and the recovery of firewood are implemented, sourcing firewood from hardwood plantations is becoming commonplace.

Softwood Plantations

Tasmania also has the sixth largest softwood plantation resource in Australia. The estate is largely mature with many areas currently in a second or third rotation. In the north of the state the plantations are primarily managed for sawlog production on a rotation of around 30 years. Intermediate thinning is becoming an increasingly common practice to stimulate diameter growth and produce larger diameter sawlogs.

In the south, softwood plantations have traditionally been managed to produce pulpwood on a rotation of approximately 20-25 years. With the sale of the Norske Skog estate in 2020 it is likely future management will shift the focus toward sawlog production over a similar rotation length and silvicultural regime to that used in the north.

Domestic processing of softwood plantation logs is dominated by:

- The Timberlink sawmill at Bell Bay processes softwood sawlogs to produce structural timber. Virtually all of the mill's sawlogs are sourced from northern Tasmania
- The largest processor of softwood pulpwood is Norske Skog's Boyer pulp and paper mill. The mill sources the bulk of its supply from the south, with around a third of its volume sourced from north east Tasmania
- Several smaller mills in northern Tasmania produce a range of products including post and poles as well as non structural packaging timber.

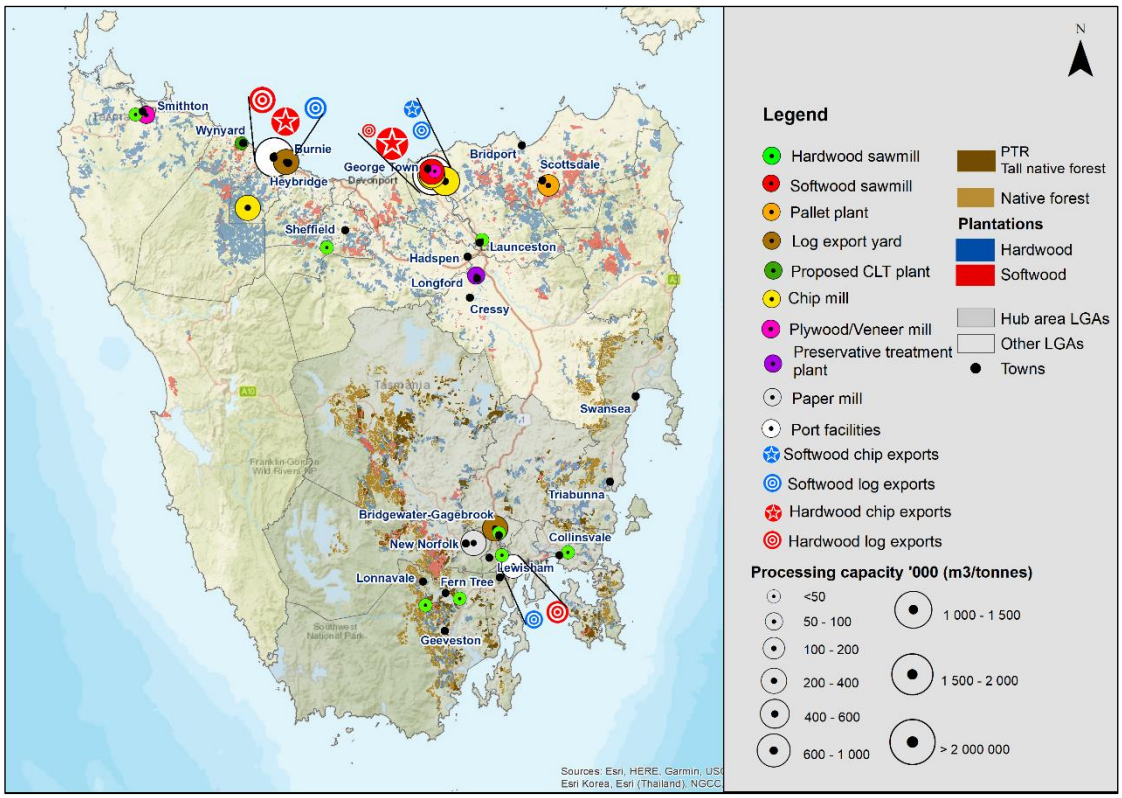
Sawlogs that do not meet domestic log specifications, or are surplus to domestic capacity are exported in bulk through Burnie, Bell Bay and Hobart Port, although these are currently limited due to Chinese log import ban. Softwood log export markets also accept fire damaged logs, providing a return to land owners and allowing fire affected stands to salvaged, clearing the land ready for replanting. Pulpwood that is within an economic haulage distance of the Norske Skog mill is processed domestically, with any surplus pulpwood exported.

Distribution of Commercial Forests Relative to Processing Infrastructure in Tasmania

Figure 2-4 shows the location of the major domestic processors and export ports relative to the distribution of commercial forests within Tasmania. It shows on a volume basis, hardwood plantations account for the largest share of harvest volume, with most exported through Bell Bay Port (including Forico's Long Reach chip export terminal) and Burnie Port.

In southern Tasmania the Norske Skog pulp and paper mill is the largest domestic processor by some margin. The Brighton Rail Hub (identified as a log export yard) is the second largest market for logs in southern Tasmania and represents the supply of hardwood pulpwood transported to Bell Bay to be exported as hardwood chip. Hobart Port is the third largest market followed by a series of smaller scale native forest hardwood mills.

Figure 2-4: Map Showing Tasmania's Commercial Production Forest Area and Associated Processing Infrastructure



Source: ABARES, STT, Global Trade Atlas, industry sources

It is the interaction between forest supply to these various end markets that dictates transport infrastructure requirements. The next sections of this report investigate the nature of this supply chain infrastructure, identifies gaps and constraints and considers potential opportunities for further infrastructure development.

3. STATUS OF EXISTING INFRASTRUCTURE

This section reviews Tasmania's freight network considering each of the main transport modes:

- Road infrastructure focusing on heavy vehicle freight routes
- Rail infrastructure including both the rail network and rolling stock
- Port infrastructure and shipping arrangements.

The analysis incorporates a literature review of reports produced on infrastructure development in southern Tasmania, including Hobart Port since 2005.

Data is presented on inter and intra regional freight flows with more detailed data presented for the forestry sector's supply chain based on Department of State Growth freight survey data published in 2018 using 2016-17 data. The survey is in the process of being updated in 2021 but the results are not yet available.

3.1 Overview of Tasmania's State Freight Strategy

Tasmania's land freight task is dominated, whether in terms of total tonnage, tonnes per kilometre (km), or dollar value, by freight flows along the dual highway/railway route between Hobart and Burnie. The sea containerised freight task is similarly dominated by Burnie and Devonport with bulk commodities exports dominated by Burnie and Bell Bay. Air freight is insignificant in terms of the state's total volume or value.

Within the broad category of freight, the following key distinctions are relevant:

- Time sensitive freight – fruit and vegetables from farm to mainland markets via Bass Strait using domestic shipping
- Containerised freight including consumer goods, also largely carried by domestic shipping
- Commodity exports flowing through dedicated ports for export.

In terms of road funding, passenger and tourist traffic is considered as important as freight.

Government Strategy for Freight

Tasmania's strategies for transport infrastructure are focused on:

- For land freight, the Hobart/Burnie corridor which carries the majority of Tasmania's freight. Investments consider both road and rail freight movements
- For sea freight, investment is guided by TasPorts' Port Master Plan that outlines key priorities for each of Tasmania's main ports (TasPorts Port Master Plan, 2018).

In terms of government strategy, contestability between rail and road transport over the primary transport route between Hobart to Burnie and to a lesser extent Bell Bay is important.

The clearest statement of Tasmania's freight strategy is the Tasmanian Integrated Freight Strategy prepared in 2016 (Infrastructure Tasmania, 2016). The introduction to this document supports the overview given in the preceding paragraphs, surveying in sequence "Bass Strait shipping", "Responding to a changing seascape", Air freight opportunities", and "An integrated land freight corridor". At the end of the land freight section, which is largely focused on the Hobart to Burnie corridor, is the following which incorporates one area of focus for this report:

> *Regional and rural roads form an important part of Tasmania's land freight network, connecting primary production areas to processing centres, and facilitating heavy vehicle access to rural and remote areas for a range of infrastructure and development purposes.*
>
> *Last mile access, which includes higher volume port and industrial centre connections, as well as lower volume rural roads, is critical to an efficient freight network. Bridge*

strength is a common constraint on rural networks. Coordinating and prioritising smaller-scale investment to ensure appropriate heavy vehicle access in regional and rural areas has been identified as a key issue.

Through the Department of State Growth, the Tasmanian Government is working with key stakeholders, including road managers, industry, and the National Heavy Vehicle Regulator with a view to facilitating efficient access to an integrated and efficient Tasmanian road network.

Apart from this discussion of "secondary road freight infrastructure", the strategy is focused on the main freight corridor and its connection to Bass Strait shipping. Tasmania's current freight infrastructure strategy offers the following primary benefits to the forest industry in southern Tasmania:

- Excellent road links north from Bridgewater
- Comparable, contestable rail links north from Bridgewater to Burnie and Bell Bay.

State investment in secondary infrastructure is typically considered on a case by case basis. Some of the key investments in infrastructure beyond the Hobart to Burnie corridor are summarised in subsequent sections of this report.

3.2 Review of Existing Infrastructure Arrangements

3.2.1 Road Ownership

Road and bridge infrastructure in Tasmania has four tiers of ownership:

- National Land Transport Network (NLTN) - nationally important road and rail links that are primarily funded by the Federal Government
- State Road Network – these are typically strategic freight routes that connect to the NLTN. In Tasmania these roads are managed by the Department of State Growth (DSG)
- Local Government roads – roads and bridges that are managed by local councils and are important in providing the 'first and last mile' connections to the freight network
- Other ownership – roads that traverse private or Crown land but are not managed by the other government agencies noted above. The 'other' category includes government agencies such as STT, Hydro Tasmania, and the Tasmania Parks & Wildlife Service. For forest growers, these roads typically represent the 'first mile' of the forestry supply chain.

Table 3-1 shows the extent of each road type within Tasmania and the tonne kilometres travelled by all industries (Tasmanian Freight Survey 2016-17, 2018). It shows the NLTN and State Road Network account for nearly 90% of total freight movement in Tasmania with LGA roads 7.5% and roads under other ownership 2.5%.

Table 3-1: Summary of Total Tasmanian Freight Movement in 2016/17 by Road Owner

Road Ownership	Total Length (km)	Tonne km Travelled (million)	% Total Tonne km Travelled (%)
National Land Transport Network – Road*	454	913	42%
State Roads	3 700	612	28%
Local Government Roads	14 470	131	6%
Roads – Other Ownership	55 448	42	2%
Total Roads	**74 072**	**1 700**	**78%***

* The remaining 22% is transported by rail

Source: (Tasmanian Freight Survey 2016-17, 2018).

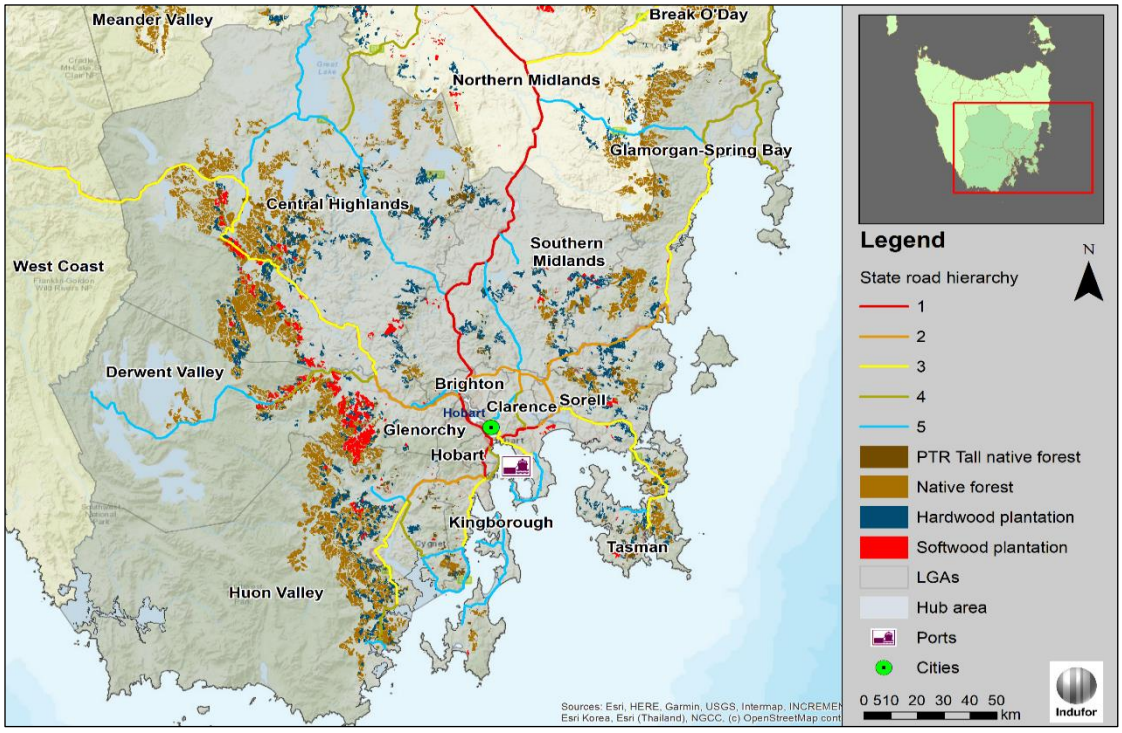
DSG classifies the NLTN and State Road Network into the hierarchy shown in Table 3-2. Figure 3-1 provides a spatial distribution of the State Road Hierarchy in southern Tasmania and the distribution of commercial forests relative to the network.

Table 3-2: National and State Road Hierarchy

Category	Purpose
1	Primary freight and passenger roads
2	Major regional roads for heavy freight
3	Main regional access roads carrying less heavy freight
4	Allow safe travel between towns, major tourist destinations and industrial areas
5	Remainder of the state road network

Source: (Tasmanian Freight Survey 2016-17, 2018).

Figure 3-1: Distribution of State Road Hierarchy within Southern Tasmania



Source: ABARES, STT, PFT, NPI

Local government is responsible for a substantial part of the road network in southern Tasmania providing an important link between the forest and the State Road Network. Table 3-3 summarises the length of road each of the councils manage as at 2019/20.

Table 3-3: Summary of the Local Government Area Road Network by Road Type

Local Government Area	Forest Area	Urban Sealed	Rural Sealed	Unsealed	Total Road Length
	(000 ha)	(Kilometres)			
Central Highlands	81	28	90	621	739
Derwent Valley	31	32	65	236	333
Huon Valley	49	52	139	518	709
Southern Midlands	14	32	167	613	812
Glamorgan/ Spring Bay	26	79	94	206	379
Sorell	7	95	110	139	344
Tasman	10	44	35	129	208
Balance	2				
Total	**218**	**362**	**700**	**2 462**	**3 524**

Source: (State Grants Commission, 2021)

Within the forest sector, STT has responsibility for managing a comprehensive road network that allow it to move timber products sourced from Permanent Timber Production Zone (PTPZ) land to connect with local council or state owned roads. The *Forest Management Act 2013* defines STT's network on PTPZ land as a 'forest road' and allows it to charge a fee for the use of a forest road for any purpose. In 2019/20 STT constructed 40.9 km of new road and maintained 3 076 km of existing roads across Tasmania (Sustainable Timber Tasmania 2019/20 Annual Report, 2021).

The Department of Primary Industries, Parks, Water and Environment (DPIPWE) also manages a significant number of roads in areas designated as Future Potential Production Forests (FPPF). These roads were originally built by Forestry Tasmania and are expected to be maintained appropriately for future access.

There is no data available that identifies the extent of the private road network in southern Tasmania. For private forestry companies, roads are typically established at the time of plantation establishment then upgraded at the time of harvesting to allow heavy vehicle access.

3.2.2 Heavy Vehicle Haulage in Tasmania

Road transportation of forest products can be undertaken using a range of truck configurations. Since July 2018 responsibility for heavy vehicle compliance and enforcement was transferred from DSG (Transport Tasmania) to the Nation Heavy Vehicle Regulator (NHVR).

From an economic perspective, the longer the haulage distance the more efficient it becomes with increasing load size. General Mass Limits (GML) state the allowable mass for all types of heavy vehicle axle groups unless the vehicle has accreditation or an exemption under the Heavy Vehicle National Law for larger loads These exemptions include:

- Concessional Mass Limits (CML) which allow small increases of 1- 2 tonnes per axle group in exchange for an auditable undertaking by operators of a very high standard of care of those aspects of the operation which relate to the avoidance of road damage
- Higher Mass Limits (HML) include all CML requirements plus Road-Friendly-Suspensions. Road friendly suspension systems reduce the impact of laden axles on road pavements and most bridge structures. HML transport must travel on authorised HML routes

- Performance Based System (PBS) are defined as Class 2 heavy vehicles (B-doubles, B-triples and road trains) and specify mass limits a vehicle is approved to operate at. Individual vehicles are assessed against a comprehensive of broader criteria relating to safety and road damage.

Logs are typically transported from the forest to the mill or wharf using either semi trailers, or where possible B-doubles. Mass limits are generally determined by axle combinations. The prime mover (truck) has an axle limit of 6 – 10 tonnes; trailers with two axle groups have mass limits of 16.5 tonnes and three axle groups have mass limits of 20 tonnes. These axle groups can be deployed in a wide range of combinations. Table 3-4 provides a summary of the different truck configurations and their maximum allowable mass limits.

Table 3-4: Heavy Freight Vehicle Combinations

Vehicle Classification	Axle Group (tonnes)	Max Length (m)	GML (tonnes)	CML (tonnes)	HML (tonnes)
Semitrailer	5 or 6 axle semi	< 19	39 – 42.5	40 – 43.5	40 – 45.5
Truck & Dog	3 axle truck/ 2-4 axle trailer	<19	40.5 – 42.5	41 – 42.5	41 – 43.5
Class 2 B-double	7 axle (mini B-double)	< 21	55.5	57	57
	8 – 9 axle	< 26	59 – 62.5	61 – 64.5	62.5 - 68
Class 3 A-double	9 – 12 axle	< 36.5	72 – 82.5	74 – 84.5	74 – 90.5

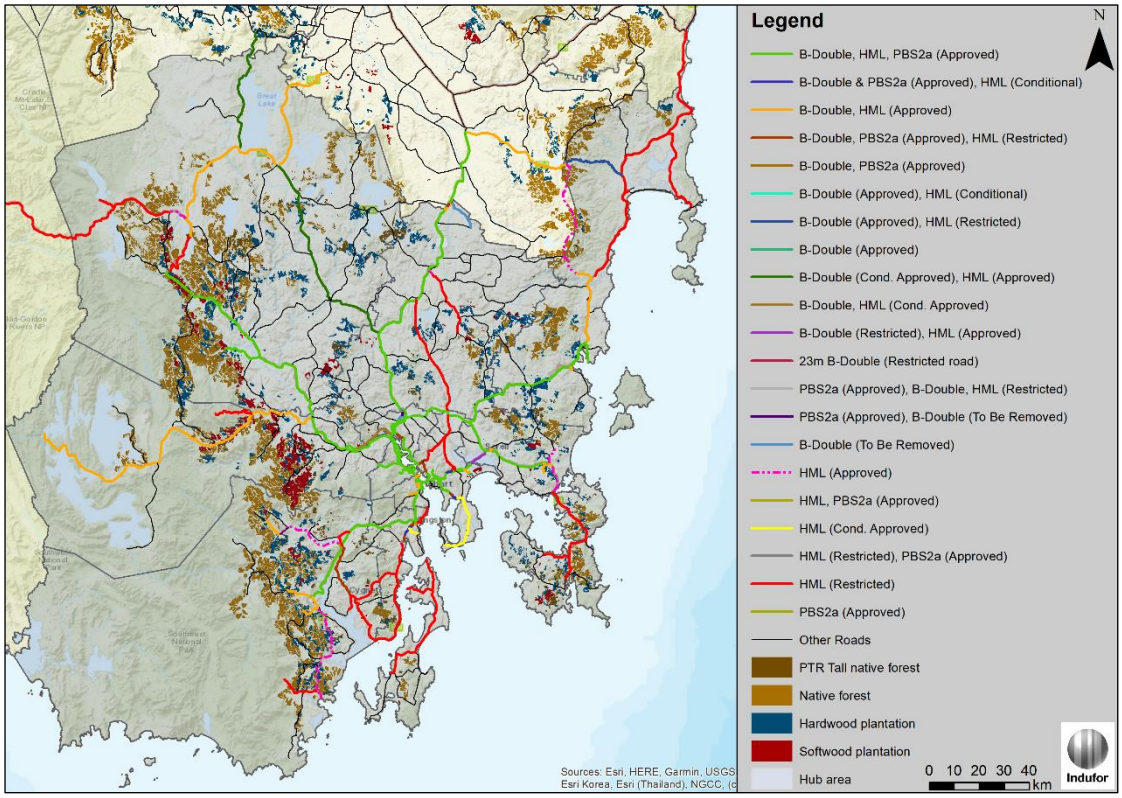
Source: National Heavy Vehicle Regulator

The forestry industry is a major user of High Productivity Vehicles (HPV – Class 2 B-doubles) transporting logs, wood chips and wood products, with the 2008-09 Tasmanian Freight Survey identifying that 40% of the tonnage of the freight task was moved by HPVs (Department of Infrastructure, Energy and Resources, 2011). Indufor notes that this proportion is likely to have increased significantly since the survey was published.

The status and distribution of the approved and restricted heavy vehicle haulage routes can be viewed spatially via the DSG website (Truck & Dog Trailer Combination Network (stategrowth.tas.gov.au)). The website contains 16 potential approval combinations. The distribution of the heavy haulage network in southern Tasmania relative to the location of the commercial forest areas is shown in Figure 3-2.

It shows that the regions with the largest forest areas have a significant network of approved heavy haulage routes. However, there are some gaps in the network or areas where heavy vehicle access is restricted. These are examined in more detail in subsequent section of the report.

Figure 3-2: Distribution of Approved Heavy Haulage Routes within Southern Tasmania



Source: Truck & Dog Trailer Combination Network (stategrowth.tas.gov.au)

Finished goods primarily utilise roads within the State Road Hierarchy or are railed to export from the state.

3.2.3 Rail Infrastructure

TasRail is a State-Owned Company that was formed in 2009 when the state government reacquired the railway from private interests. TasRail manages both above-rail (rolling stock) and below-rail (track and associated infrastructure) assets as a vertically integrated rail operator. The network is based on narrow gauge track standard of 3ft 6inches (1,067 mm) and has axle load limitations of 18 tonnes over most of the network (Sagerer & Chou, 2017).

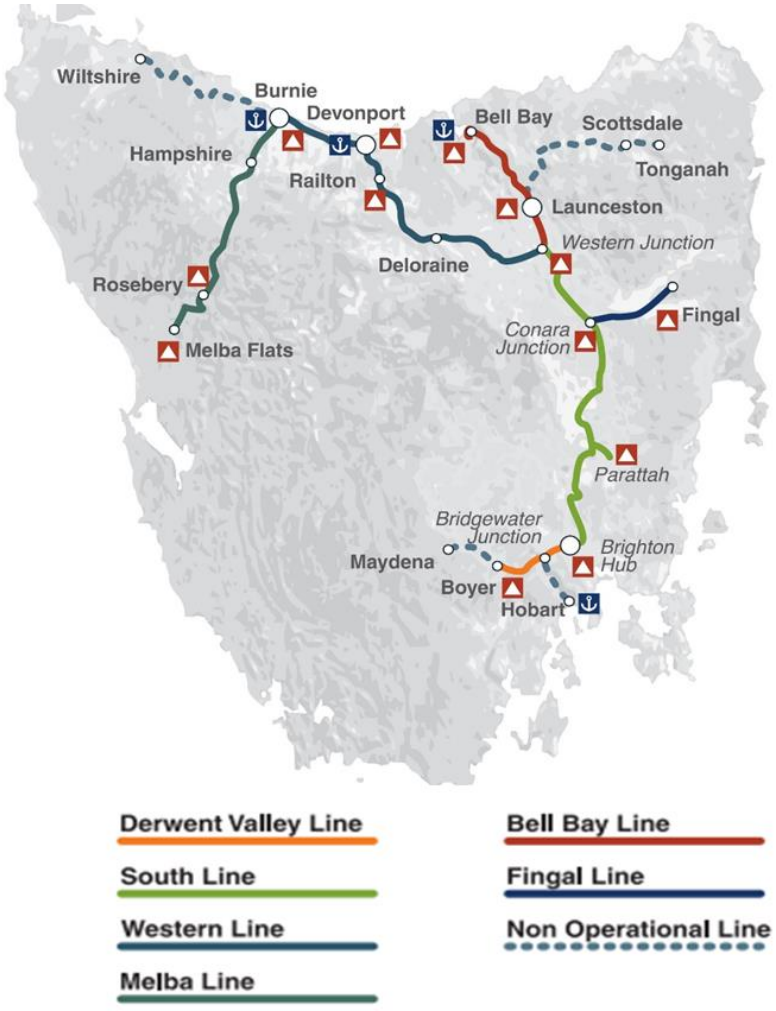
All corridors on the network have a single track configuration, which means trains travelling in opposite directions can only pass each other at designated crossing loops, where a section of double track is provided for that purpose. The frequency and location of these crossing loops controls the design of train timetables and is one of the limitations on the capacity of the network to accommodate trains (Parsons Brinckerhoff, 2016). TasRail advise that while the crossing loops do represent a limitation, it is the size of its container wagon fleet rather than the network that represents a more immediate capacity constraint to expanding its forestry operations.

Figure 3-3 provides an overview of the TasRail network. Key general freight handling terminals are located at Brighton, Parattah, Railton, Devonport and Burnie on the main corridor, and at Boyer, Fingal, and Bell Bay/Georgetown on the branch lines. In addition, Launceston and Conara have the capacity to handle freight as required.

The Burnie to Hobart mainline corridor extends from Burnie Port in the north-west to Brighton Transport Hub (Hobart) in the south. There are also operational branch lines connecting to the mainline for the following locations:

- Bell Bay Port and Launceston connecting at Western Junction
- Fingal connecting at Conara
- Boyer connecting at Brighton Junction
- Melba Flats to Burnie.

Figure 3-3: Overview of TasRail's Rail Network and Freight Terminals



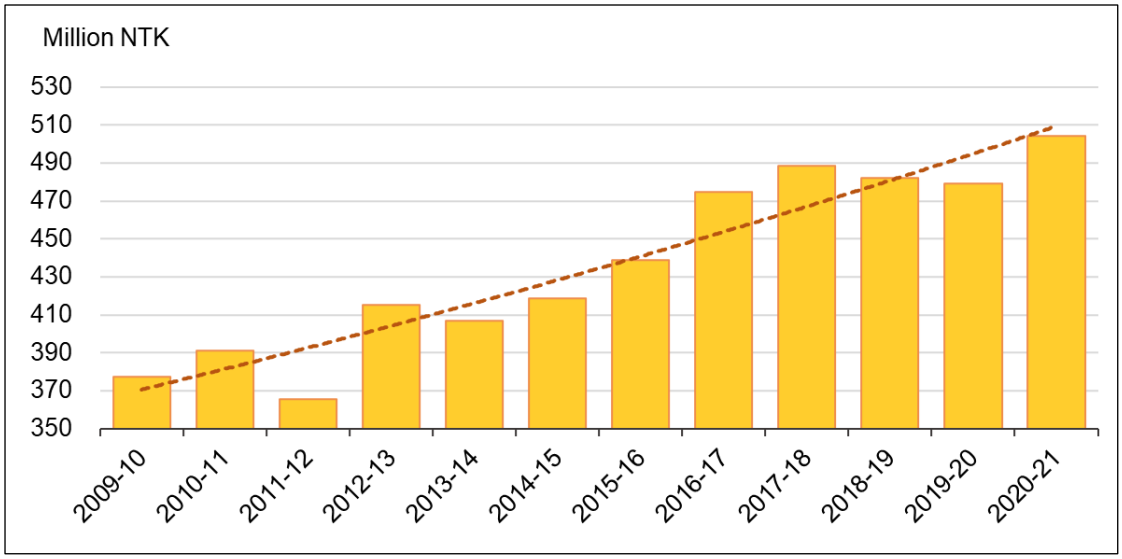
Source: TasRail

Key products transported by TasRail include: containers (for multiple customers), bulk commodities (cement and coal), minerals and ores and forestry (logs and finished goods).

In 2020/21 TasRail's total freight task was around three million tonnes, a ~ 30% increase since its formation in 2009. This growth is underpinned by a substantial capital investment in the network and rolling stock.

On a net tonne kilometre (NTK) basis, the total freight task in 2020/21 was slightly over 500 million NTK (see Figure 3-4). This is consistent with TasRail's forecast growth trajectory in freight volumes following a decrease the previous year, largely due to disruptions to domestic and international supply chains caused by the COVID-19 pandemic.

Figure 3-4: Growth in TasRail's Total Freight Task



Source: TasRail

TasRail operates approximately 100 rail services per week across its entire network. The forestry sector accounts for two of TasRail's three daily freight services which depart from Brighton and operate six days per week.

One train service is dedicated to the transport of pulp logs sourced from native forests and hardwood plantations. Logs are trucked from the forest to the Brighton Transport Hub (Figure 3-5) or the Parattah Rail Siding (Figure 3-6) where wagons are loaded and transported to either the Artec or Reliance Forest Fibre hardwood chip facilities at Bell Bay. Both mills have sidings where logs can be unloaded and stockpiled inside the mill gate.

Figure 3-5: Log Storage and Loading at the Brighton Transport Hub

Source: TasRail

Figure 3-6: Log Storage and Loading at the Parattah Rail Siding

Source: TasRail

To improve the efficiency of the log transport operation, TasRail in partnership with Elphinstone Engineering have developed the 'Logtainer', a standard container sized unit with movable stanchions that allow logs to be loaded onto standard rail wagons (or flat-bed trucks). When empty the stanchions can be lowered allowing either a container to sit on top of the Logtainer, or the Logtainers can be stacked together allowing space for additional containers to be loaded for the return trip (Figure 3-7). The modular nature of the Logtainer system means it can manage variable log lengths ranging from 2.2 m to 12 m.

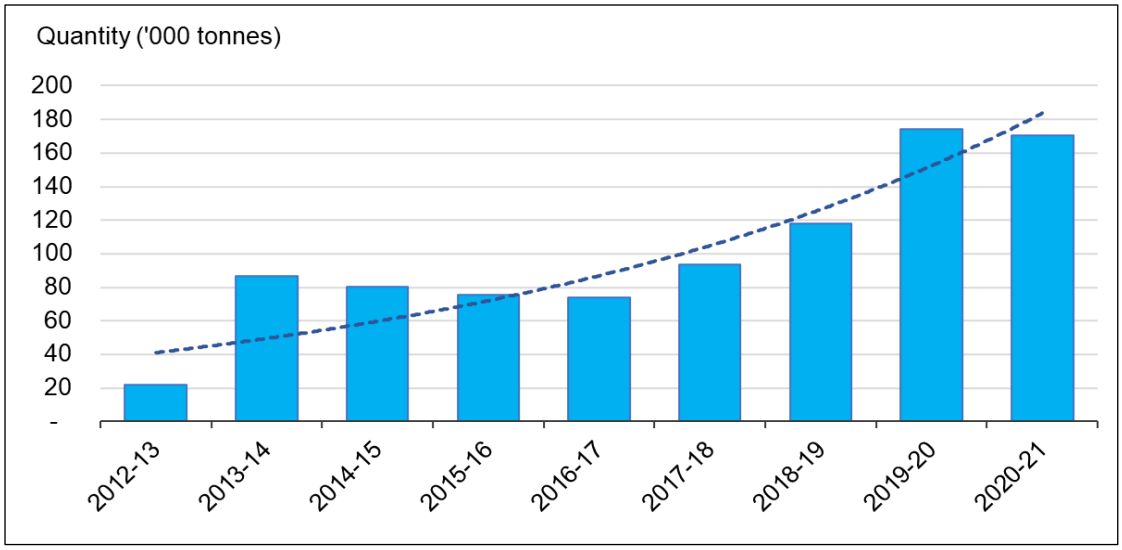
Figure 3-7: Example of a Logtainer and Nested Empty Logtainers

Loaded Logtainer **Nested Empty Logtainers**

Source: TasRail

Figure 3-8 shows that log volumes transported from the south have grown significantly, increasing by around 42% in 2019/20. Much of this increase is due to the commissioning of the Parattah Rail Siding in early 2020.

Figure 3-8: Growth in Southern Tasmania Log Freight Movement by Rail



Source: TasRail

A second rail service is dedicated to the Norske Skog pulp and paper mill. This service transports containerised paper from a siding within the Boyer mill directly into the container terminal at Burnie Port. For the return trip the train transports containerised raw materials and machine parts for the mill as well as empty containers for loading with paper. Around 70% of the returned containers are loaded.

The third rail service is for general container freight shifting north and south.

TasRail operates a fleet of 17 TR Class locomotives. The locomotives were all acquired in 2013 and are seven years into their expected operational life of ~30 years. TasRail's current rolling stock that is relevant to the forest sector is summarised in Table 3-5. The wagons listed in Table 3-5 achieve an average payload of approximately 37-38 tonnes of round logs.

Table 3-5: Summary of TasRail's Current Rolling Stock

Rolling Stock	Total Number	Number Deployed in Log Services	Key Features
TQAY Class Container Wagon	166	6	Support Logtainer use Operate from Brighton and Parattah
TQMF Class Container Wagon	15	15	
TFAF Class Log Wagon	40	40	Dedicated to whole log transport Fixed Stanchions Don't carry Logtainers in their current configuration Targeted (but not limited) to Parattah operations
Logtainers	40	40	Fitted to container wagons (using twist locks) Two Logtainers are fitted to each container wagon 40 more Logtainers soon to be in production

Source: TasRail

TasRail is currently experiencing record demand for container transport which impacts on its capacity to haul Logtainers (as the same wagons classes are used for both Logtainers and containers). However, the network has not yet reached capacity, providing scope for future growth in log transport capacity with the addition of more container wagons to the existing rolling stock.

3.2.4 Port Infrastructure

Tasmania's commercial ports are managed by the Tasmanian Ports Corporation Pty Ltd (TasPorts). TasPorts was established in 2006 through a merger of four regional port authorities. TasPorts manages 11 ports and one airport in Tasmania. Most Tasmanian freight travels through the four ports summarised in Table 3-6. The location of the three main forestry ports is shown in Figure 2-4.

Table 3-6: Key Import/ Export Commodities by Port

Port	Export Goods	Import Goods	No. Ships FY19/20
Burnie	Woodchips, logs, timber, paper Zinc, sand, aluminium, lead, magnetite Dairy products, vegetables	Oil and petroleum Motor vehicles Clay, coal, fertiliser	487
Bell Bay	Woodchips, logs, timber Manganese, aluminium, sinter Vegetables	Oil and petroleum Met fines, alumina Coal	198
Devonport	Timber Aluminium Oil, petroleum and gas Cement Grain, livestock, vegetables	Oil and petroleum Motor vehicles Grain, fertiliser	899
Hobart	Logs, timber Refined zinc and zinc by-products Sulphuric acid Fertiliser	Oil and petroleum Calcite, phosphate rock Zinc concentrate	321

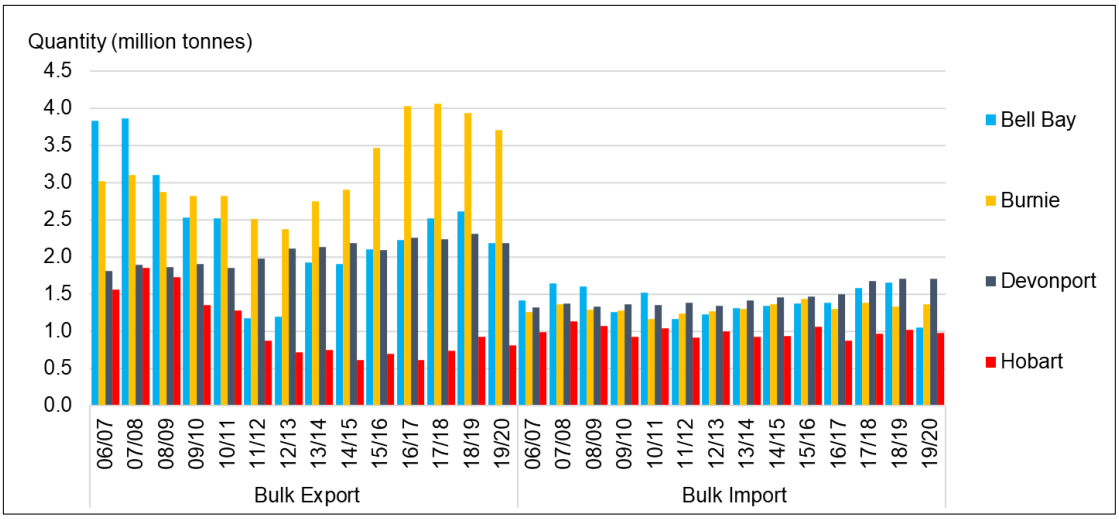
Source: (Ports Australia, 2021), (TasPorts, 2021)

Figure 3-9 shows the total bulk volume of all products exported and imported from the four main ports. No data is available for volume by commodity type. Figure 3-10 shows the total inward and outward flow of containers in twenty foot equivalent units (TEU).

The data shows Burnie has the largest export volume by some margin with Hobart having the smallest export volume, with the Burnie exports rising markedly since 2011/12, while Hobart exports declined significantly from 2008/09 through to 2014/15 and remained relatively static since. Bulk imports have been relatively consistent over the past 5-7 years with the majority of imports arising from the three northern Tasmanian ports.

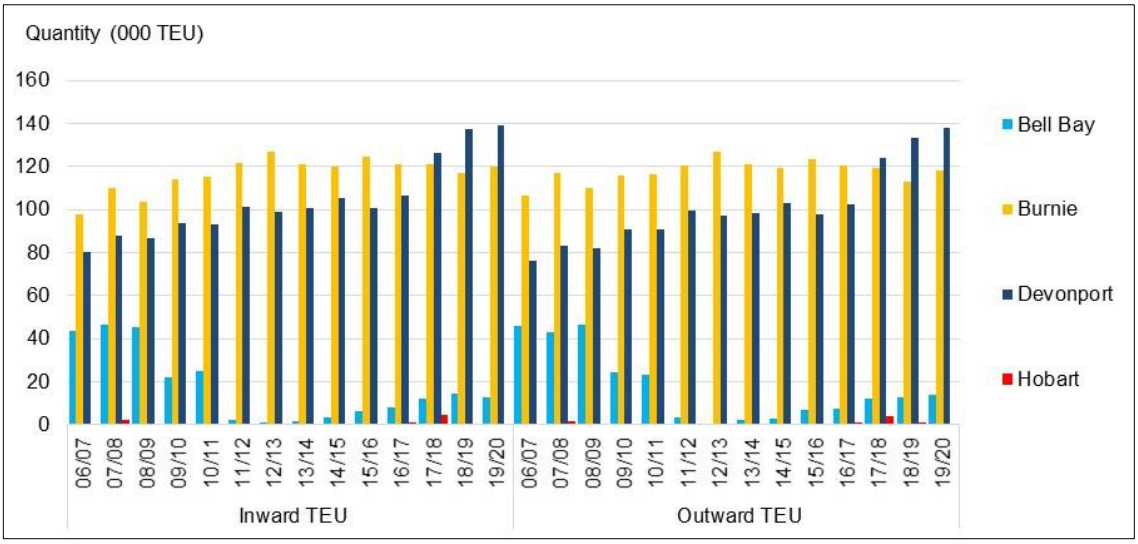
In terms of container volumes, both inward and outward movements are dominated by Burnie and Devonport. Container movements out of Hobart are minimal as there is currently no container shipping service.

Figure 3-9: Bulk Import and Export Volumes for Major Tasmanian Ports



Source: (TasPorts, 2021)

Figure 3-10: Tasmanian Container Import and Export Volume



Source: (TasPorts, 2021)

Several companies run domestic freight shipping routes:

- Toll Holdings operates a container freight service between Burnie Port and the Port of Melbourne
- SeaRoad and TT Line operate a container freight service between Devonport and the Port of Melbourne
- MSC Mediterranean Shipping Company S.A. operates a freight service that services Australia (Melbourne, Sydney, Brisbane and Bell Bay), Noumea and New Zealand (Auckland, Tauranga)
- Nyrstar operates a dedicated bulk shipping service between its operations in South Australia and Hobart.

Other bulk commodities such as calcite, cement, fertiliser, coal, iron ore and woodchips are typically shipped directly from Tasmanian ports to export markets.

3.3 Movement of Freight and Key Forest and Wood Products Around Tasmania

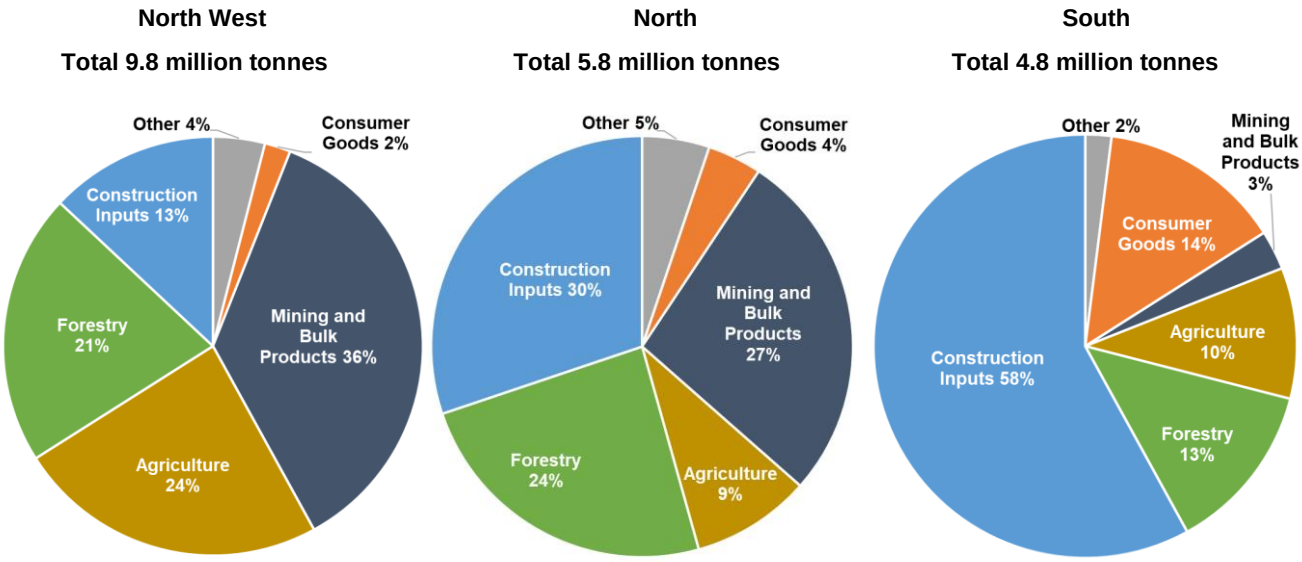
DSG undertakes a regular survey of heavy vehicle freight movements across Tasmania. The latest survey was completed in 2016/17. The 2016/17 results are based on 60 interviews with a range of freight producers and forwarders supplemented by reported data. The survey covers businesses across a range of industries including:

- Agriculture (milk, vegetables, fertiliser, beer and animal feed)
- Construction inputs (stone, sand, clay and premixed concrete)
- Consumer goods (petrol, diesel, groceries and consumer goods)
- Mining (ores, cement and basic metals)
- Forestry (harvested logs and wood products).

In 2016-17, Tasmania's road and rail freight network carried 25.7 million tonnes, which travelled around 2.2 billion tonne-kilometres. The majority of the freight task used the road network – 88% by mass and 78% by tonne-kilometres (see Table 3-1), compared to 12 per cent by mass and 22 per cent by tonne-kilometres for rail (Tasmanian Freight Survey 2016-17, 2018).

The distribution of the overall freight task by commodity group is shown in Figure 3-11.

Figure 3-11: Intra Regional Freight Task by Commodity Group



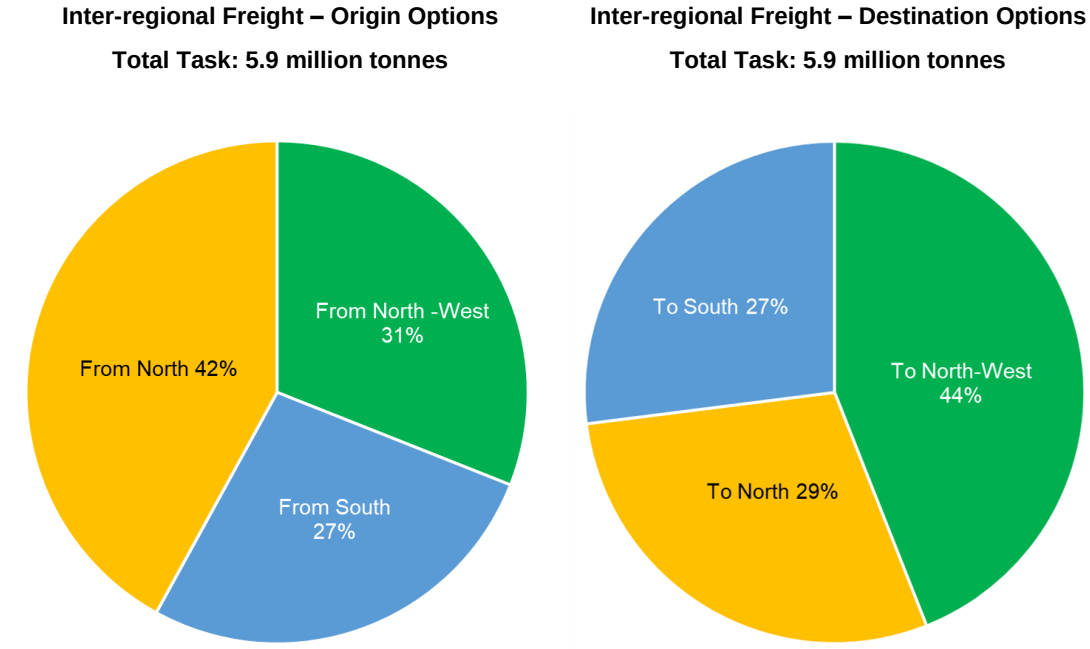
Source: (Tasmanian Freight Survey 2016-17, 2018).

Inter-regional freight flows at an aggregated level are presented in Figure 3-12. From the northern region the major movements were agricultural freight and coal to the north west with groceries, logs and coal transported south.

From the north west region most movements related to groceries fuel and consumer goods heading to the northern and southern regions as well as cement and mining ores also travelling south.

From the south the major movements were livestock, fish, paper, newsprint and zinc travelling to the north west and logs, wood products and construction inputs heading to the northern region.

Figure 3-12: Inter-Regional Freight Task by Region



Source: (Tasmanian Freight Survey 2016-17, 2018).

While the data suggests forestry is not the largest freight group, when distance travelled is incorporated the forest industry had the largest freight task moving seven million tonnes representing 27% of Tasmania's total freight mass and 33% on a tonne/km basis.

Figure 3-13 shows the overall flow of forestry related freight within Tasmania. Harvested logs are the predominant forestry product transported representing a total mass of 4.6 million tonnes. Timber and paper products account for the remaining 2.4 million tonnes. By mass 86% of logs harvested were exported or processed within the region of origin with 14% travelling between regions.

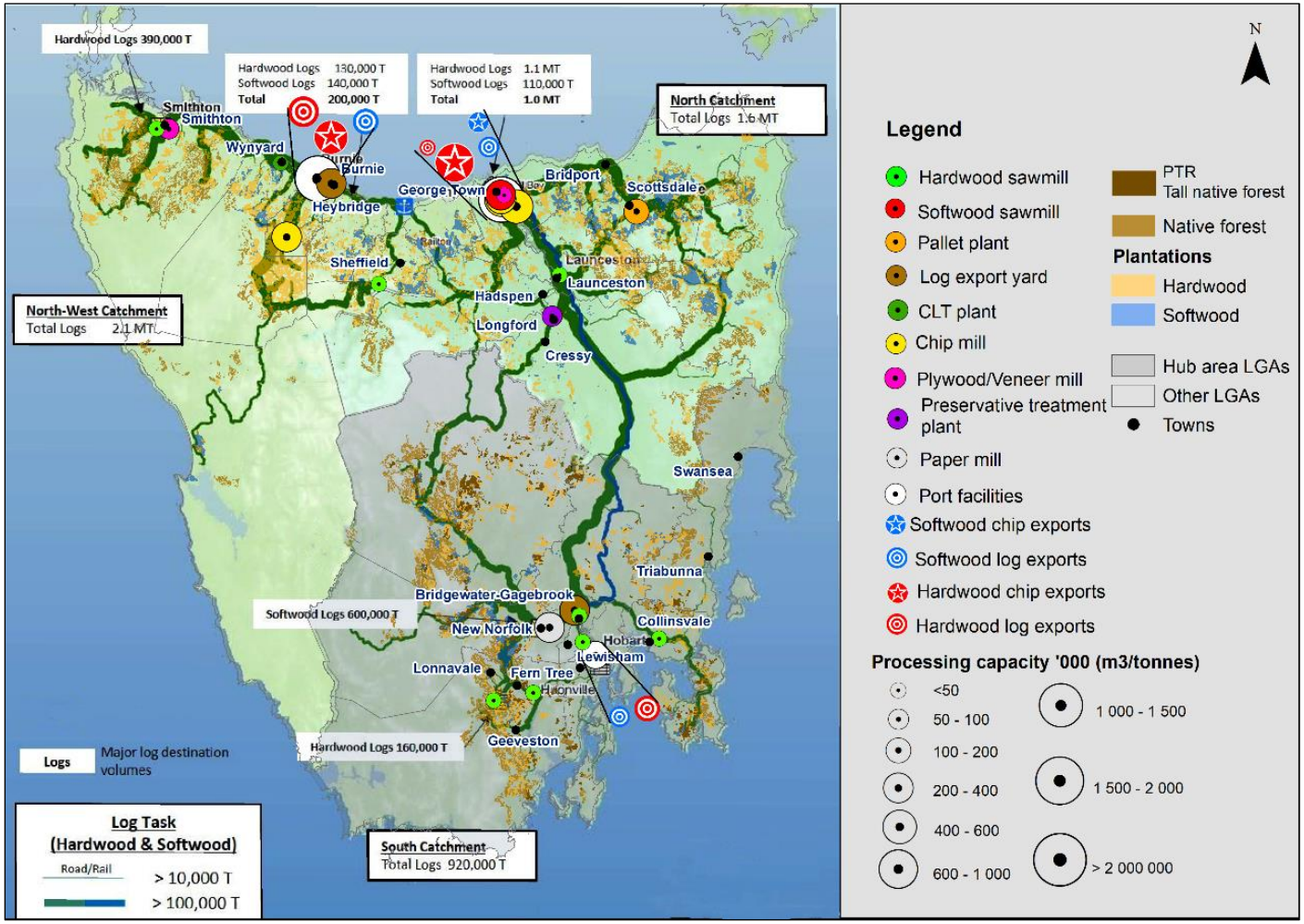
The north west region has the highest freight task with 2.1 million tonnes of logs transported. This is mostly hardwood pulpwood which is chipped and exported through Burnie Port. This supply is supplemented with softwood and hardwood log exports as well as veneer which is also exported. Sawn timber represents a relatively small volume which is either consumed domestically or exported via Burnie Port of Devonport Port.

The north region had the second largest log freight task with 1.6 million tonnes. This volume is supplemented by inter-regional supply of 370 000 tonnes from the south. This is primarily hardwood pulpwood sourced from the Central Highlands (via the Lakes region) and the Derwent Valley (via the Midland Highway) LGA's and transported to Bell Bay for chipping and export. This movement is partially offset by 150 000 tonnes of mostly softwood pulpwood which is transported on the Midland Highway on a back cart arrangement from the north region to the south to supply the Norske Skog pulp mill.

Consequently only 59% of the 920 000 tonnes of logs produced in the south are processed in the region. The major destination for processed forest products is Burnie Port, with around 310 000 tonnes of paper transported by rail. Sawn timber was either sold locally or transported to Burnie Port or Devonport Port for shipping to the Australian mainland.

At the time of the 2016/2017 survey there were virtually no log exports from Hobart Port. This trade has developed since then with volumes to be reflected in the 2021 survey which is currently being compiled.

Figure 3-13: Overview of State-wide Freight Movements for the Forest Sector



Source: (Tasmanian Freight Survey 2016-17, 2018), ABARES, STT, industry sources.

For wood flows generated in the south key supply chain infrastructure includes:

- A cohesive road network across the region that allows growers to maximise log truck loads
- Transport routes are concentrated toward the Midland Highway focused around Brighton in the south and the Lakes district of the Central Highlands region in the north, albeit at a much smaller scale.

3.4 Existing Infrastructure Commitments with Estimated Costs

Infrastructure funding comes from a variety of sources with the State and Federal Governments making the largest contribution.

Funding in the State Budget

The Tasmanian State Budget Papers on infrastructure expenditure is presented in Table 3-7. For completeness it covers expenditure for all of Tasmania and incorporates Federal and State funding.

It shows there is significant ongoing capital investment in the key transport routes, with smaller levels of investment occurring on secondary routes.

Table 3-7: 2020/21 Tasmanian Infrastructure Budget Funding ($ million)

Infrastructure Project	Start	Complete	Estimated Total Cost	2020-21 Budget	2021-22 Fwd Est	2022-23 Fwd Est	2023-24 Fwd Est
STATE FUNDED CO-CONTRIBUTION PROJECTS[1]							
Brooker Highway	2015	2021	32.0	0.2	….	….	….
Domain Highway Planning	2015	2021	5.0	0.2	….	….	….
Freight Access Bridge Upgrades	2017	2022	31.1	2.8	….	….	….
Greater Hobart Traffic Solution[2,3,4]	2019	2025	200.8	16.8	26.7	27.8	58.7
Infrastructure Stimulus Funding[5]	2020	2022	86.8	24.7	27.8	….	….
Midland Highway[2,6,7]	2014	2025	515.0	….	….	3.0	….
New Bridgewater Bridge[2]	2019	2025	576.0	3.0	15.0	38.0	56.3
Roads of Strategic Importance[2,11]	2019	2025	786.3	10.1	19.7	11.5	13.5
South East Traffic Solution[2,8,9]	2019	2025	64.0	0.7	16.2	11.8	16.5
State Road Upgrades - NW and West Coast Region[2]	2019	2025	50.1	10.8	9.8	12.8	7.1
State Road Upgrades - Northern Region[7]	2019	2024	54.2	12.6	13.0	3.9	1.5
State Road Upgrades - Southern Region[7]	2018	2024	99.8	42.8	10.9	2.1	5.3
Urban Congestion Fund[2,4,10]	2019	2025	87.7	4.7	8.6	8.5	3.3
Subtotal Co-contribution Projects[1]				**126.4**	**147.5**	**119.5**	**162.2**
Bruny Island Landside Infrastructure	2020	2021	7.5	7.5	….	….	….
Bus Services as part of the Hobart City Deal	2021	2022	0.5	….	0.5	….	….
Esk Main Road	2015	2021	13.0	0.2	….	….	….
Extending the Great Eastern Drive - Binalong Bay Road	2019	2022	4.5	2.2	2.2	….	….
Great Eastern Drive	2018	2021	6.3	0.4	….	….	….
Infrastructure Maintenance		Ongoing	Ongoing	67.9	69.0	70.9	72.8
Launceston and Tamar Valley Traffic Vision[2]	2019	2025	75.1	7.3	2.6	4.5	18.8

Infrastructure Project	Start	Complete	Estimated Total Cost	2020-21 Budget	2021-22 Fwd Est	2022-23 Fwd Est	2023-24 Fwd Est
Mowbray Connector	2018	2021	7.0	0.3	….	….	….
Network Planning		Ongoing	Ongoing	0.9	1.1	1.1	1.1
Program Management		Ongoing	Ongoing	7.8	7.9	8.1	8.3
Road Safety Projects		Ongoing	Ongoing	8.2	13.9	10.9	12.0
Roads Package to Support Tasmania's Visitor Economy	2019	2022	66.1	26.3	11.0	….	….
Tasmanian Journeys	2019	2022	0.8	0.7	0.1	….	….
Traffic Management and Engineering Services		Ongoing	Ongoing	3.5	3.6	3.7	3.7
West Tamar Highway Traffic Solution	2019	2021	12.7	12.7	….	….	….
Subtotal Other Roads Infrastructure				**148.7**	**111.9**	**99.1**	**116.7**
TOTAL STATE FUNDED ROADS				**275.1**	**259.4**	**218.6**	**279.0**
AUSTRALIAN GOVERNMENT FUNDED[1]							
Brooker Highway	2015	2021	32.0	1.1			
Domain Highway Planning	2015	2021	5.0	1.0	….	….	….
Freight Access Bridge Upgrades	2017	2022	31.1	6.0	6.0	….	….
Greater Hobart Traffic Solution[2,4]	2019	2025	200.8	0.5	….	25.0	20.0
Infrastructure Stimulus Funding[5]	2021	2022	86.8	32.6	1.7	….	….
Midland Highway[2,6]	2014	2025	515.0	23.1	8.9	68.3	52.7
New Bridgewater Bridge[2]	2019	2025	576.0	30.0	50.0	150.0	211.0
Roads of Strategic Importance[2,11]	2019	2025	786.3	88.3	149.3	134.5	193.3
Urban Congestion Fund[2,4,10]	2019	2025	87.7	4.1	13.4	9.5	10.0
Subtotal Investment Program[1]				**186.7**	**229.3**	**387.3**	**487.0**
Bridge Renewal Program		Ongoing	na	5.1	2.2	1.7	….
Heavy Vehicle Safety and Productivity		Ongoing	na	6.0	2.7	….	….
Road Safety Projects		Ongoing	na	3.5	2.8	2.8	….
Road Specific Maintenance		Ongoing	na	8.1	7.7	7.7	7.7
Subtotal Other Roads Infrastructure				**22.8**	**15.4**	**12.1**	**7.7**
AUSTRALIAN GOVERNMENT FUNDED ROADS				**209.5**	**244.7**	**399.5**	**494.7**
TOTAL ROADS PROGRAM EXPENDITURE				**484.6**	**504.1**	**618.1**	**773.6**

Notes:

1. These projects are funded by both the State and Australian Governments.
2. The Estimated Total Cost reflects funding beyond the 2020-21 Budget and Forward Estimates period.
3. Includes the Government's commitment of $20 million for the Kingborough Congestion as part of the Hobart City Deal.
4. Includes the State and Australian Government's co-contribution of $65 million for the Tasman Bridge Upgrade.
5. Initiative is funded by the State and Australian Governments. It will support the undertaking of a number of important road and bridge projects throughout the State, and also provide support for the construction industry.
6. Includes additional funding of $50.2 million from the Australian Government and $20 million from the State Government.
7. The State Government's contribution to the Midland Highway is also incorporated into State Road Upgrades - Southern Region and State Road Upgrades - Northern Region.
8. Includes the State Government's commitment of $37 million to the Hobart to Sorell Corridor - Midway Point and Sorell Causeways.
9. This project includes the balance of the State funding contribution to the Roads of Strategic Importance.
10. Includes the State and Australian Government's co-contribution commitment of $1.5 million for the Tasman Bridge Intelligent Transport Solutions.
11. Includes the Australian Government's commitment of $150 million to the Hobart to Sorell Corridor - Midway Point and Sorell Causeways, as well as funding for the Hobart Airport Interchange.

Source: (Department of Treasury of Finance, 2021)

TasRail

Table 3-8 shows the capital funding profile from the Tasmanian and Federal Governments to support Tranche 2 and Tranche 3 of the Tasmanian Freight Rail Revitalisation Program. A further $5.0 million is being provided by the Tasmanian Government to modernise the forestry supply chain and infrastructure.

Table 3-8: TasRail External Capital Funding Allocation* ($ million)

Capital Funding Source	2019/20	2020/21	2021/22	2022/23	2023/24	Total	Comment
Tranche 2 Funding	29.9	29.9	29.9	29.9		119.6	Funded by the Tasmanian and Federal Government
Tranche 3 Funding		13.0	21.0	28.0	34.0	96.0	
Parattah weighbridge	0.6					0.6	Funded by the Tasmanian Government
TAS Govt. Forestry Stimulus		2.5	2.5			5.0	
Total	**30.5**	**45.4**	**53.4**	**57.9**	**34.0**	**221.2**	

* Excludes internally funded business as usual locomotive and wagon capital renewal programs

Source: TasRail

Infrastructure Funding and Expenditure by Local Councils

Councils are responsible for maintaining the road network within their jurisdiction. Reporting of expenditure of roads is variable, but one useful measure is the life cycle cost which takes into consideration the average cost required to sustain the asset over its useful life. Life cycle costs can be compared to life cycle expenditure to give an indicator of sustainability in service provision. Life cycle expenditure includes operating, maintenance and capital renewal expenditure in the previous year. Life cycle expenditure varies depending on the timing of asset renewals (Derwent Valley Council, 2018).

A shortfall between life cycle cost and life cycle expenditure provides an indication of the life cycle gap that needs to be addressed. Table 3-7 provides a summary of the main council expenditure life cycles where this information is available. Reporting does not follow a standardised format so there are some gaps in the data.

Table 3-9: Council Expenditure on Road and Bridge Infrastructure

LGA	Asset	Life Cycle Cost	Life Cycle Expenditure	Life Cycle Gap	Life Cycle Indicator
		($ 000)			
Derwent Valley	Bridges	635	381	-254	60%
	Roads	4 238	4 615	377	109%
Central Highlands	Roads & bridges	2 380	2 383	3	100%
Huon Valley	Roads & bridges	Not specified	6 117	Not specified	99%*
Southern Midlands	Bridges	379	525	-146	138%
	Roads	3 227	3 028	-199	94%
Tasman	Roads & bridges	2 533	2 480	-122	98%
Glamorgan/Spring Bay	Roads & bridges	Not specified	3 550	Not specified	Not specified
Sorell	Not specified	Not specified	Not specified	Not specified	Not specified

* Based on the asset sustainability ratio (where 100% means depreciation is fully funded)

Source: Council Asset Management Strategy documents

In all circumstances councils indicate they have limited capacity to directly fund major road or bridge upgrades and would require state or federal support for these projects.

Most council roading funding is sourced locally through rates charges. Additional Commonwealth Financial Assistance (CFA) grants are made annually through State Grants Commissions to local councils. The greater portion of CFA grant is called Road Grant Funding, although this represents a methodology for calculating the split between states and councils as the grants are not tied to the application by councils in any way.

In 2020/21 the total Road Grant Funding to Tasmanian councils was $41.7 million of which examples are $2.0 million to Brighton Council and $1.7 million each to Huon Valley and Southern Midlands Council. The State Grants Commission also administers the distribution to councils of $1.5 million which is allocated by the state government from state heavy vehicle motor tax revenues. The national principle governing the Road Grant Funding is “based on the relative need of each local governing body for road expenditure to preserve its road assets. In assessing road needs, relevant considerations include length, type and usage of roads in each local governing area” (State Grants Commission, 2021). The focus of this funding is to maintain the integrity of the road network, not to upgrade it.

Other Private and Public Infrastructure Costs

STT manages an extensive network of forest roads for its own use and public access to the land it manages. Expenditure on roads is not disclosed but in its 2019/20 annual report it reported maintaining 3 076 km of existing road and constructing 40.9 km of new road. Private growers are responsible for the road network within their property. Larger growers can sometimes contribute toward the cost of upgrading council roads where there is a clear benefit.

Indufor estimates expenditure on these internal forestry roads to be in the vicinity of $4 - $8 million/year across southern Tasmania.

4. HOBART PORT

This section provides a detailed assessment of Hobart Port and its current and future role for the forest sector in southern Tasmania. It considers the economic value of the port and presents a scenario outlining the potential impacts on the forest industry should the port not be available for the export of forest products.

An evaluation of the potential reactivation of rail into Hobart Port and Hobart City traffic congestion issues are outside of Indufor's scope of work.

4.1 Current Status

Hobart Port is located on the Derwent River, adjacent to the Hobart CBD. Total throughput is dominated by bulk mineral imports and exports from Nyrstar's privately owned terminal located at Lutana and fuel storage at Self's Point. The port supports a variety of industries including bulk log exports, commercial fishing, Antarctic exploration vessels and cruise ships.

Container shipping through the port has occurred periodically. The most recent container shipping service from Hobart Port was operated by Swire Shipping between 2014 and 2018. The operation was discontinued in 2018 when increased charter and bunker costs combined with low operating capacity affected the commercial viability of the service.

Figure 4-1 provides an overview of the infrastructures at Hobart Port. Most commercial port traffic utilises the Macquarie Wharf complex. The Princess Wharf area is more oriented toward tourism as an extension to Hobart's CBD.

Figure 4-1: Overview Map of Hobart Port

Source: TasPorts: Macquarie Wharf Redevelopment

Figure 4-2: Aerial View of Hobart Port Showing the Log Storage Area at Macquarie Wharf

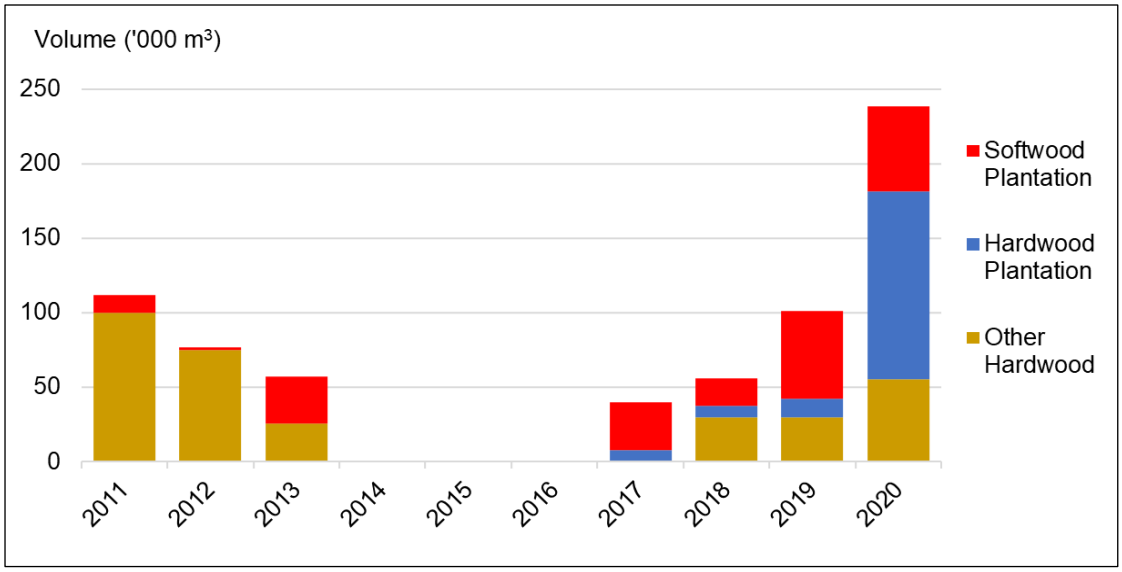
Source: ABC News – image supplied to the ABC by TasPorts

Logs are exported in bulk from Macquarie Wharf berths 4 and 5. Figure 4-3 shows the volume of bulk log exports from Hobart Port since 2011 when the Triabunna chip mill closed and alternative supply chain arrangements were made for pulpwood produced in southern Tasmania. In addition to redirecting pulp logs to Bell Bay, log export markets were also developed, primarily as an outlet for low quality native forest logs.

Between 2011 and 2013 virtually all hardwood log exports were native forest logs. These exports entered a period of hiatus before recommencing in 2017.

In January 2017 TasPorts and Qube Ports jointly established Southern Export Terminals Pty Ltd (SET). SET provides open-access log storage and ship loading facilities to all growers seeking to export logs from Hobart Port. Since SET was established the volume of logs exported has grown significantly comprising native forest logs, as well as hardwood and softwood plantation logs. In 2019/20 SET exported approximately 245 000 m^3 (296 000 tonnes) of logs, loading 14 log carrying vessels (TasPorts, 2021). This was a combination of hardwood plantation logs, native forest peeler logs (Other Hardwood) and softwood plantation logs sourced from multiple growers.

Figure 4-3: Bulk Log Exports from Hobart Port



Source: (Global Trade Atlas, 2021), Indufor estimates for Other Hardwood log volumes based on industry data

The key drivers of growth since SET was established include:

- The development of new markets for hardwood peeler logs in China and Malaysia
- Maturing of the hardwood plantation estate in the south, most of which was established between 2000 – 2010
- The transfer of ownership to professional timberland investors who have the capacity to expand log trading opportunities
- Closure of the Ta Ann veneer mill at Southwood in 2020 (this supply is currently being exported as alternative options are being examined).

The current annual capacity of the SET operation is estimated by TasPorts to be around 400 000 – 500 000 tonnes/year indicating the facility is currently not operating at full capacity.

Over the long term TasPorts expects log export volumes through Hobart Port to increase. To increase its operating efficiency, TasPorts demolished redundant buildings inside the secure port zone during 2020 to improve the layout of the log storage area.

The second stage of the improvement project involves realigning the security fence and reconfiguring access to the Macquarie Wharf 4 sheds to improve safety. These changes are currently under way and are expected to increase the log storage yard area to 20 000 m^2 (2 ha) providing capacity to store up to 42 000 tonnes of logs.

Over the medium to long-term there are two important infrastructure issue that have the potential to significantly influence the future of log export operations from Hobart Port.

4.2 Infrastructure Issue 1: Need to Upgrade Macquarie Wharf

The various Macquarie Wharf berths were built between 1969 and 1975. While there has been some routine maintenance, the wharf assets are approaching the end of their serviceable life. This means additional maintenance is required annually just to maintain minimal service levels. One of the current key limitations is a reduction in deck load limits to 2.5kPa, restricting cargo movements, including log storage and loading on Macquarie Wharf 6.

TasPorts reports that the 'do nothing' approach would see significant limits on current and future vessel sizes, with the port unable to accept the new planned cruise vessels or additional Antarctic scientific research vessels. This option would also limit log export capacity and restrict any future container throughput (TasPorts, 2021).

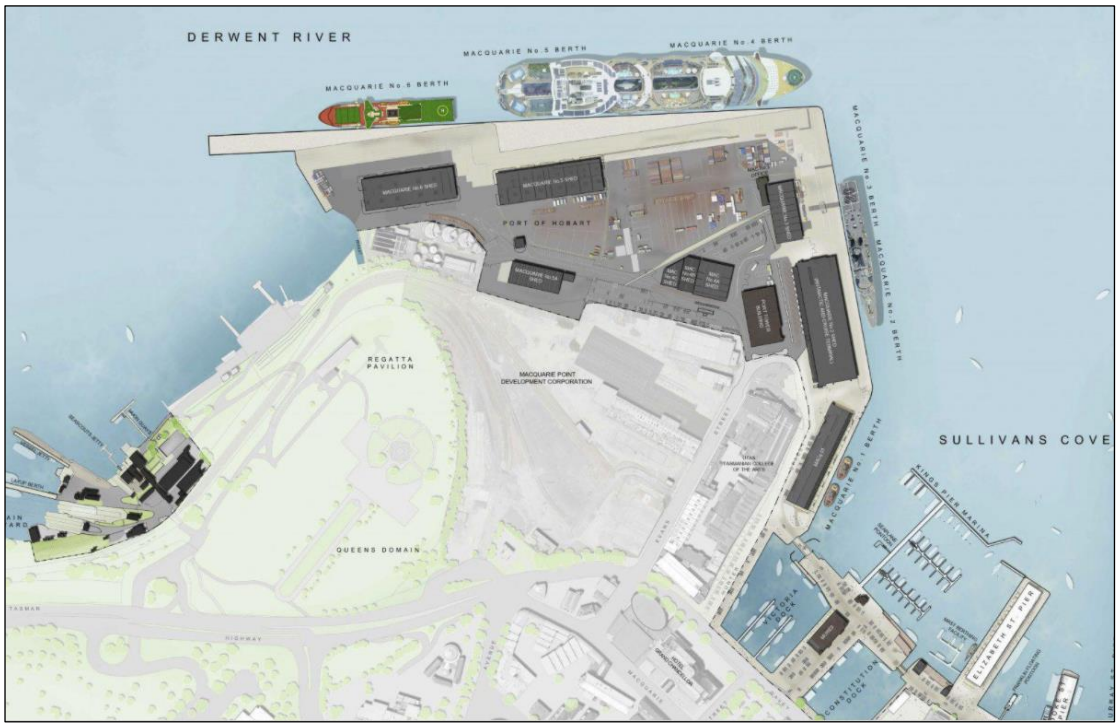
TasPorts Port Master Plan was published in 2018 to guide capital investment in Tasmanian port infrastructure over a 15-year period. A significant capital upgrade was identified for Hobart Port to enable future growth in the tourism, trade and Antarctic sectors. A key part of this upgrade is the expansion of the Macquarie Wharf 4, 5 & 6 berths.

The proposed redevelopment of Macquarie Wharf involves the construction of three multi-user berths that will enable:

- A multi-user Antarctic Precinct focused on the Antarctic science and research sector
- A dedicated cruise ship terminal with capacity to berth the new Oasis-class cruise vessels (5 400 passengers)
- Expanded storage capacity to support increased throughput of export logs and containers (TasPorts, 2021).

The preferred design option shown in Figure 4-4 involves the construction of a 720 m continuous quay line from Macquarie Wharf 4 through to Macquarie Wharf 6. The current quay line is 615 m. The continuous quay line will allow Oasis-class cruise vessels, Antarctic research vessels, and bulk log or container cargo to berth simultaneously. The redevelopment would support the growth of log exports and any potential future container throughput, lifting capacity by up to 52 additional container services per year.

Figure 4-4: TasPorts Proposed Macquarie Wharf Redevelopment Design



Source: TasPorts: Macquarie Wharf Redevelopment

Other improvements associated with the redevelopment include:

- Strengthen dedicated heavy-lift areas across Macquarie Wharf 5
- Additional passenger terminal facilities for processing and disembarkation from Macquarie Wharf 4 and 5
- Localised remediation of Macquarie Wharf 4
- Freight yard and traffic reconfiguration and associated security modifications to improve operating efficiency (TasPorts, 2021).

The Port Master Plan notes that TasPorts propose to invest $50-$60 million towards the redevelopment. However, the Tasmanian Government has also made an application to Infrastructure Australia for Federal Government funding. No details are available on the application, but media outlets report an estimated cost of $150 million (Daily Cargo News, 2021).

The proposal is currently progressing through Infrastructure Australia's assessment process. It has passed Stage 1: Problem identification and Prioritisation and was included on Infrastructure Australia's Infrastructure Priority List in February 2021. The Project is now in Stage 2: Initiative Identification and Options Development. DSG advise that the documentation for Stage 2 has not yet been submitted.

If Stage 2 is approved the application would then proceed to Stage 3: Business Case Development and finally Stage 4: Business Case Assessment. The proposed timeframe for project approval is within the next five years. DSG advise that the proposed Macquarie Wharf upgrade has a strong level of government support.

4.3 Infrastructure Issue 2: Macquarie Point Redevelopment and Northern Road Access

Immediately behind TasPorts' secure port area is around 9.3 ha of disused railyards and industrial land known as Macquarie Point. In 2012 this land was vested by the Tasmanian Government to the Macquarie Point Development Corporation (MPDC) with the intent of developing Macquarie Point land to provide sustainable social and economic benefits to Hobart.

The MPDC is responsible for site remediation and redevelopment of the land for mixed use that complements existing activities in the Hobart CBD and waterfront. The redevelopment is to be based on planning and urban design principles while maintaining public open space, promoting pedestrian and bicycle use and links to public transport (Macquarie Point Development Corporation Act, 2012).

An artist's impression of the proposed redevelopment of Macquarie Point based on the current Master Development Plan is shown in Figure 4-5. The development is being undertaken in stages with the first land release at The Escarpment (0.8 ha) currently under way via a competitive bid process. A second land release at The District – incorporating The Gateway, The Promenade and The Underground (2.7 ha) is currently at a pre-registration of interest stage (Macquarie Point Development Corporation, 2020). Both sites are zoned for mixed use.

Figure 4-5: Proposed Macquarie Point Redevelopment Design

Source: Macquarie Point Development Corporation 2019/20 Annual Report

An Antarctic and Science precinct is currently identified as the proposed main use for The Precinct.

As the development progresses, there will be increasing interaction between residents, visitors and businesses at Macquarie Point and the users of Hobart Port. This raises the potential for conflict around matters such as hours of port operations, noise and dust issues and particularly for the forest industry, the movement of trucks to and from the port.

Northern Road Access to Hobart Port

All bulk freight traffic enters Hobart Port via Evans Street. Trucks originating from the south travel down Macquarie Street before turning right onto Evans Street. Trucks originating from north or east of Hobart can either travel via the Brooker Highway or the Tasman Highway before the two roads merge into Davey Street and turn left onto Evans Street. There are currently no limitation on truck numbers.

TasPorts advised that its current unloading capacity is around 1 600 tonnes per day which equates to an average of 40-60 truck loads per day depending on truck configuration. Two way travel means an average of 80-160 truck movements per day along Evans Street. The access routes to Hobart Port are shown in Figure 4-6. It also shows the layout of the log stacks within the port zone as well as a log ship in the process of being loaded.

Heavy freight vehicle use of Evans Street is variable and increases significantly when vessels are being loaded. Due to limited storage capacity at Macquarie Wharf hot loading (loading from a truck directly onto a vessel) is often required due to storage capacity constraints. For these reasons ongoing 24 hour access to Evans Street is critical.

Figure 4-6: Current Truck Access Route into Hobart Port

Source: Google Earth Pro

The Macquarie Point development includes a Northern Vehicular Access project which aims to provide infrastructure and supporting services as well as the construction of a road to support access for development parcels.

Stage one of the project was completed in December 2020 and provides vehicle access to the site from the Tasman Highway and incorporates bike and pedestrian paths. It also includes a 10-metre-wide corridor for a future transit solution.

Stage two of the project will include developing a northern entry point to support the Antarctic and Science Precinct as specified under Hobart City Deal. The Implementation Plan also identifies decommissioning of the TasWater waste water treatment plant which was notionally scheduled to be completed by 2023 (Hobart City Deal - Implementation Plan, 2019). In the 2019/20 budget the State Government committed $300 million to TasWater over a 10-year period for major infrastructure projects, including the decommissioning of the Macquarie Point wastewater facility (Treasury Tasmania, 2020). TasWater as the agency responsible for the decommissioning has not confirmed that it would be able to meet the proposed timeframe or the potential cost of the project.

MPDC documentation notes that the final transit zone alignment for the Northern Vehicular Access project is subject to the outcomes of a State Government study, but it is expected to incorporate public transport, although the links have not yet been identified.

MPDC already has an allowance for a 24 m wide Northern Transit Corridor easement running from The Escarpment along the existing railway reservation (MPDC, Site Infrastructure, 2021).

In 2018 Evan Rolley undertook a strategic review of the options available to maximise the value of forest resources in southern Tasmania infrastructure (Rolley, 2018). The report identified the benefits of a northern road access to Hobart Port particularly in light of the Macquarie Point development which would potentially impact on heavy freight vehicles being able to continue using Evans Street. The report noted the importance of Hobart Port and the access it provides to competitive international markets as well as the opportunity to export value added forest

products at some point in the future. The report recommended that the land for the route be permanently zoned to provide long term certainty to ongoing access.

These objectives still apply to the sector today and align with the MPDC intent to establish a northern access route. Given the engineering and logistical challenges, it is therefore in the forest industry's interests to engage with MPDC's and other interested parties to establish a northern access road to Hobart Port. An integrated approach is required to fully realise the benefits of the various stakeholders and provide greater certainty over ongoing access to Hobart Port.

4.4 Economic Analysis of Hobart Port

Hobart Port is an integral part of the supply chain infrastructure for southern Tasmania as it provides an important outlet for low quality logs sourced from native forests and plantations. It has become increasingly important as the hardwood plantation estate matures and becomes ready for utilisation and the region's softwood plantations transition to a greater proportion of sawlog supply.

This section compares two plausible economic output scenarios for forest and wood products from forests in southern Tasmania.

- ***Scenario 1 – Base case.*** Considers a business as usual approach based on the ongoing ability to export logs from Hobart Port to international markets
- ***Scenario 2 – Hobart Port unavailable***. This scenario assesses the impact of the port not being available for forest exports.

Scenario 2 considers the potential loss of the log export market from an economic perspective through the additional costs incurred diverting logs to alternative markets, the likelihood of replanting and subsequent impact on regional employment.

The economic impacts are calculated on an annualised basis. Indufor estimated the net present value of these changes by discounting the annual change (on a pre tax basis) by a discount rate of 8%[1] over a 30 year timeframe.

4.4.1 Description of the Base Case and Comparison Scenario

The financial balance of the forest and wood product sector depends on multiple factors, including markets offering a sufficient purchase price, adequate infrastructure and contractor availability at a viable cost. It also depends on the timing of harvesting in plantations or the availability of native forest with the right maturity to allow harvesting. The availability of Hobart Port as an export facility needs to be considered in the context of these parameters when examining its impact on the sector in southern Tasmania.

Other factors of significance for the analysis include:

- Harvested forests yield only a proportion of high quality logs; pulpwood processed into woodchips are either a by-product or can be the primary product, but they always participate in the financial balance of forestry production
- There is no mill in southern Tasmania to process chip logs and wood chipping occurs at Bell Bay. Any new investment envisaged in processing facilities is highly likely to be located in the same region (as evidenced by Midway's establishment of a third chip mill at Bell Bay)
- Logs produced in southern Tasmania come from a mix of estates some being hardwood plantations, native forests or softwood plantations

[1] Discount rates for commercial forest valuations in Australia typically range from 6% to 9% when applied to real, pre-tax cash flows.

- STT is required by legislation to make available 137 000 m^3/year of high quality sawlog to industry from PTPZ land (which can be from public native forests or plantations). Post 2027, there is likely to be a transition to a lower level of native forest harvesting which will be offset by increased supply from its long rotation hardwood plantations
- Investments in plantations are such that what is currently standing is likely to be harvested, even if the economic viability deteriorates. However, replanting becomes more unlikely at the end of the rotation if the returns are insufficient to support a re-investment decision
- Bell Bay is considered the primary alternative destination to Hobart Port for log exports and domestic softwood sawlogs.

To assess the importance of the Hobart Port, a baseline with the port continuing to operate in the long term should be compared to a scenario where the port is assumed to stop exporting logs and no alternative port is available in the south:

Scenario 1: Base case

- Logs continue to be exported through the Hobart Port based on current levels of activity for the foreseeable future
- Beyond 2027, STT's hardwood plantations are harvested at a larger scale supplementing a reduced level of high quality sawlogs sourced from native forests
- Hardwood pulpwood is transported to Bell Bay for chipping and export
- Replanting occurs at the end of the rotation for all plantation areas.

Scenario 2: Hobart Port unavailable for log exports

- The Hobart Port is assumed to be unavailable for forest product exports with SET ceasing operations in the near future (assumed to be within 5 years)
- STT continues to deliver on its legislative obligation to deliver sawlogs. Therefore, any arising grades would still need to be processed which means all other log grades would be transported to Bell Bay for export. Post 2027, it is assumed that STT's hardwood plantation estate is maintained, and all non high quality sawlog supply has to be transported to Bell Bay
- Vertically integrated industrial hardwood plantation growers are likely to continue to deliver wood to processing facilities in the north to maintain the value of their investment, even at reduced overall margins. While it is difficult to predict how the closure of Hobart Port will affect decision-making, a decline in plantation area is assumed in areas identified as being marginal with no replanting occurring in areas with extremely long haulage distances
- Softwood volumes that cannot be exported through the Hobart Port are assumed to be redirected domestically to the Norske Skog pulp mill and Timberlink's softwood sawmill at Bell Bay Timberlink. The Norske mill was constructed in 1941 and currently has an annual production capacity of 290 000 tonnes of paper split evenly between coated and un-coated production. The main markets for the paper produced from the mill has been in structural decline since 2010 and there is scope for the mill to further reduce production. The assessment assumes the mill continues to function at current levels. Any softwood sawlog supply to the Timberlink mill would need to be of sufficient density and strength properties to allow the mill to produce structural sawn timber.

4.4.2 Woodflow Scenarios

Indufor prepared a woodflow model based on contemporary resource data for each of the major growers in the region. The resource data and corresponding wood flow data was aggregated at a LGA level. To maintain the confidentiality of the data, forest type or resource owners are not identified. The resource data used for the assessment has been collected over the past five years and covers 198 000 ha (90%) of the commercial forest resource in southern Tasmania. No data is available for the private hardwood plantation resource or the tall eucalypt resource within Private Timber Reserves owned by small growers. Each ownership and forest type represents an area of around 20 000 ha. In the woodflow forecast these resources are assumed to maintain a stable supply of 300 000 tonnes/year.

Woodflows were prepared on an annual basis but have been averaged over two periods 2021 to 2027, then 2028 to 2050. There is a high degree of uncertainty around these woodflow forecasts post the recent major fire events. At a regional level there are not expected to be any major increases in wood supply. The timing of harvesting on private land is likely to be more variable with timing of harvesting driven more by prevailing market conditions.

Key assumptions for the economic impact assessment include:

- A centroid was adopted within each LGA based on the distribution of forests with transport routes mapped to Hobart Port and Bell Bay
- Haulage costs are based on generic Tasmanian transport costs assuming 25% of the volume is transported on semis with 75% transported by B-double trucks.

The Kingborough, Clarence, Brighton, Glenorchy and Hobart LGA's have virtually no supply and are therefore excluded from the analysis.

The relative wood flow outputs for 2021 – 2027 and for 2028 – 2050 are shown in Table 4-1.

- In the base case, the woodflows show the current level of exports to Hobart Port can be maintained at around current levels, possibly with some scope to realise additional peeler log volume from the chip log supply. Bell Bay volumes appear high, but there has been increased activity with Midway entering the Tasmanian hardwood chip market and securing additional volume and the Parattah rail siding opening up allowing an increase in volume from the south east
- From 2028, there is an increase in export logs in the base case, largely due to STT's long rotation hardwood plantations creating significantly more peeler logs than would be realised from hardwood pulpwood plantations. The decline in chip log supply to Bell Bay and domestic processing reflects a reduction in native forest harvest volumes and a dip in the regional softwood age class profile
- Should Hobart Port cease log exports then hardwood export log supply would be diverted to Bell Bay increasing chip log supply by approximately 240 000 tonnes (31%). Domestic softwood processing would also increase with softwood pulpwood being redirected to Norske Skog on the basis total volume remains within Norske Skog's current annual log intake. There would be little softwood sawlog produced over the first wood flow period.

Table 4-1: Assumed Average Annual Woodflow Forecast for Southern Tasmania 2021 – 2027 and 2028 – 2050 (000 tonnes/year)

	Scenario 1 - Base Case to 2027				Scenario 1 - Base Case from 2028			
Local Government Area	**Export through Hobart**	**Exported through Bell Bay**	**Domestic Processing**	**Total Southern Wood Production**	**Export through Hobart**	**Exported through Bell Bay**	**Domestic Processing**	**Total Southern Wood Production**
Central Highlands	79	236	126	442	102	228	106	436
Derwent Valley	50	143	179	371	72	129	144	345
Huon Valley	72	162	28	262	78	145	28	250
Sthn Midlands	27	84	10	121	23	83	8	115
Glamorgan/ Spring Bay	22	79	2	104	19	78	3	99
Sorell	10	31	6	47	9	30	5	44
Tasman	13	36	9	58	11	31	8	50
Total	**273**	**771**	**365**	**1 410**	**316**	**725**	**306**	**1 348**
Local Government Area	**Scenario 2 - Hobart Port Closed to Exports to 2027**				**Scenario 2 -Hobart Port Closed to Exports from 2028**			
Central Highlands	-		137	442	-	262	140	401
Derwent Valley	-	305	194	371	-	118	195	314
Huon Valley	-	177	30	262	-	158	32	190
Sthn Midlands	-	232	11	121	-	40	12	52
Glamorgan/ Spring Bay	-	110	2	104	-	75	3	78
Sorell	-	101	7	47	-	5	8	12
Tasman	-	40	10	58	-	10	11	21
Total	**0**	**48**	**396**	**1 410**	**-**	**670**	**408**	**1 077**
Net Change	**-273**	**1 013**	**31**	**0**	**-316**	**-55**	**102**	**-271**

Source: Indufor analysis based on industry sources, ABARES

The economic consequences of these wood flow projections are summarised in Table 4-2 and then described in more detail in subsequent sections.

Table 4-2: Economic Consequences of Changes in Wood Flow if Hobart Port not Available for Log Exports

Consequences	To 2027 (000 tonnes/year)	From 2028 (000 tonnes/year)
Change in southern Tasmanian production	0	-271
Change in Hobart Port activity	-273	-316
Change in Bell Bay Port activity	242	-55
Change in domestic processing	31	102
Change in land transport	273	-55 to Bell Bay -216 to Hobart Port

Source: Point Advisory - derived from Indufor data in Table 4-1

4.4.3 Port Operations

SET's operations at Hobart Port started in 2017. According to information in the media at the time, SET provides ongoing direct employment for 25 full time equivalent employees (FTEs).

Should SET's activities at the Hobart Port cease, it is assumed that:

- Log shipping will be transferred from the Hobart Port to Bell Bay, with potential transfer of employment, although it is likely that the increase in traffic in Bell Bay will not require the same number of FTEs. This employment will be lost to the southern region
- This will likely have minimal flow-on consequences on Hobart regional product and employment given the scale and overall diversity of Hobart's economic activities
- A small proportion of bulk ships calling at Hobart Port (estimated to be 12%) will not be required anymore
- From 2028, activity related to wood chipping and export is expected to fall by approximately 55 000 tonnes/year which will not have a significant impact on total port activity at Bell Bay.

A cessation of log exports through Hobart Port would result in a decline in revenue from the provision of log storage and ship loading services. Prior to 2028 there is assumed to be no revenue impact as the logs are still exported, but through Bell Bay rather than Hobart Port.

Beyond 2028, the size of the forest estate in southern Tasmania would likely decline. Consequently harvest volumes also decline resulting in a reduction in revenue received by the port.

This reduction in harvest volume is estimated to be around 190 000 tonnes/year. The calculation is based on the difference between the post 2028 volume for Hobart Port under Scenario 1 and the post 2028 volume diverted from Hobart Port to Bell Bay in Scenario 2.

Assuming port costs of $30/tonne this results in an annual lost of revenue post 2028 of $5.7 million/year. On a net present value basis this equates to a total net loss of $36 million over a 30 year timeframe.

4.4.4 Export Value

Table 4-1 indicates that supply to Hobart Port can be maintained at around current level with a forecast around 273 000 tonnes/year available to 2027. Based on Indufor's estimate of a Free on Board[2] (FOB) export price for export logs of AUD$100/ tonne (this is a composite price for a typical range of hardwood and softwood log export grades), this equates to annual sales revenue of $27.3 million/year generated from log export operations at Hobart Port.

The net present value of this pre-tax revenue (prior to any deductions for domestic production costs) is estimated to be $341 million assuming a discount rate of 8%and volumes remain at this level on a perpetual basis.

In the event Hobart Port becomes unavailable for log exports, the value of wood exports could be significantly affected post-2028 as the area established to hardwood plantations declines due to a reduction in economic returns:

- Up to 2027, there is unlikely to be any drop in the value of forest and wood exports. Some additional local processing may occur, but it is assumed that the same volume of logs would be exported through Bell Bay
- After 2028, it is assumed that the volume of logs and woodchips decrease by:
    - Approximately 55 000 tonnes/year for Bell Bay, at an average FOB export price of $102.5/ tonne (average of logs and chips, at current prices)
    - Approximately 316 000 tonnes/year for Hobart Port at an average FOB export price of $100/tonne (logs only).

[2] The Free on Board price is the price for goods once loaded onto a ship

However, some of the wood could potentially be redirected to local processors (102 000 tonnes/year estimated) and hence has been valued at a market price of AUD$60/tonne based on current industry surveys of softwood pulpwood prices. Table 4-3 summarises these potential impacts.

Table 4-3: Changes in the Value of Exports Post 2028

	Volume (000 tonnes)	Price (AUD$/t)	Change in Revenue (AUD$ million/year)
Bell Bay Port	- 55	FOB - 102.50	- 5.6
Hobart Port	- 316	FOB - 100.00	- 31.6
Annual Decrease in Export Revenue			*- 37.2*
Annual Increase in Local Processing Revenue	102	Mill gate - 60.00	6.1
Net Change in Export Revenue			**-31.1**

Source: Indufor, KPMG - Australian Pine Log Price Index, Point Advisory

It shows from 2028 there would be on average an overall net decline in export revenue of $31.1 million/year as the estate size in southern Tasmania declines.

The net present value of this decline in export revenues from 2028 assuming no revenue change before that time and an 8% discount rate is $195 million.

4.4.5 Harvesting and Haulage

Harvesting and haulage activities will be impacted differently by changes in the forestry activity profile in southern Tasmania:

- Harvesting costs depend solely on the nature of the harvested areas in any single year. These are influenced by factors such as piece size, stocking, slope and log forwarding distance to roadside
- Haulage costs also depend on volume but are also impacted on the distance to processing facilities, for example the additional transport distance to Bell Bay in northern Tasmania, if log exports from Hobart Port were to cease.

Key assumptions for the economic impact assessment include:

- A centroid was adopted within each LGA based on the distribution of forests with transport routes mapped to Hobart Port and Bell Bay
- Haulage costs are based on generic Tasmanian transport costs assuming 25% of the volume is transported on semis with 75% transported by B-double trucks. The cost analysis assumes all log transport is by truck.

As a result of the hypothetical comparison case scenario:

- Until 2027, as wood keeps being harvested, there is no drop in harvesting and haulage. On the contrary, haulage costs increase by about $6.4 million per year (as shown in Table 4-4) as wood is diverted from Hobart Port to Bell Bay, while harvesting costs would remain the same
- From 2028, there is an overall drop in both harvesting and haulage as the volumes of wood production decrease and the total plantation area in southern Tasmania declines:
    - The anticipated loss of haulage volumes may depend on the region, some regions still benefit from increased business (e.g. Central Highland LGA)
    - There is likely to be a reduction in haulage volumes to Bell Bay (Table 4-5), estimated at $1.8 million/ year and a reduction of haulage volumes to Hobart Port estimated at $3.9 million/ year in turnover for the haulage industry (Table 4-6)

- From 2028, the harvesting industry may suffer a loss of $6.8 million/ year (as shown in Table 4-7), based on an assumed harvesting cost of $25/tonne.

The need for additional transport is likely to benefit the haulage industry but it reduces the margin of wood producers, as wood chip prices are set internationally therefore any additional production costs incurred are highly unlikely to be passed on to ultimate customers.

The decrease in haulage cost post 2028 is due to declining volumes and is a loss for the haulage industry. This reduction does not benefit wood exporters as it is based on a reduction in overall volume.

The estimated economic impacts are outlined below.

Table 4-4: Additional Haulage Costs Associated with Assumed Redirection of Wood Flows to Bell Bay Pre-2027

Local Government Area	Redirected to Bell Bay (000t/year)	Additional Cost of Log Transport to Bell Bay (yearly to 2027)					
		Distance to Hobart Port (km)	Distance Mobil Road, Bell Bay (km)	Haul Cost Hobart Port ($/t)	Haul Cost Bell Bay ($/t)	Additional Haul Cost to Bell Bay ($/t)	Additional Haulage Cost ($M/year)
Central Highlands	79	126	198	22.20	32.82	10.62	0.8
Derwent Valley	50	73	283	15.29	46.07	30.78	1.5
Huon Valley	72	78	327	15.85	53.23	37.38	2.7
Sthn Midlands	27	63	204	13.86	33.76	19.90	0.5
Glamorgan/ Spring Bay	22	135	184	23.45	30.65	7.20	0.2
Sorell	10	52	258	12.07	42.00	29.93	0.3
Tasman	13	95	301	17.85	49.00	31.15	0.4
Total	**273**						**6.5**

Source: Point Advisory - derived from Table 4 1 and Indufor cost assumptions

Table 4-5: Difference in Haulage Costs Associated with Redirection of Wood Flows to Bell Bay Post-2028*

Local Government Area	Change in Transport to Bell Bay (000t/year)	Change in Cost of Log Transport to Bell Bay (yearly from 2028)					
		Distance to Hobart Port (km)	Distance Mobil Road, Bell Bay (km)	Haul Cost Hobart Port ($/t)	Haul Cost Bell Bay ($/t)	Additional Haul Cost to Bell Bay ($/t)	Additional Haulage Cost ($M/year)
Central Highlands	34	126	198	22.20	32.82	10.62	0.4
Derwent Valley	-11	73	283	15.29	46.07	30.78	-0.3
Huon Valley	13	78	327	15.85	53.23	37.38	0.5
Sthn Midlands	-43	63	204	13.86	33.76	19.90	-0.9
Glamorgan/ Spring Bay	-3	135	184	23.45	30.65	7.20	-0.0
Sorell	- 25	52	258	12.07	42.00	29.93	-0.7
Tasman	121	95	301	17.85	49.00	31.15	-0.7
Total	**-55**						**-1.8**

* The change in volume incorporates both the decrease in volume associated with a rationalising of the estate as well as the diversion of volume from Hobart Port

Source: Point Advisory - derived from Table 4-1 and Indufor cost assumptions

Table 4-6: Loss to the Haulage Industry Associated with No Log Exports from Hobart Port Post-2028

Local Government Area	Decrease in Haulage Volumes to Hobart from 2028 (000t/year)	Additional Cost of Log Transport to Bell Bay from 2028		
		Distance to Hobart Port (km)	Haul cost Hobart Port ($/t)	Change in Haulage Cost (M$/year)
Central Highlands	-68	126	22.20	-1.5
Derwent Valley	-21	73	15.29	-0.3
Huon Valley	-74	78	15.85	-1.2
Sthn Midlands	-19	63	13.86	-0.3
Glamorgan/ Spring Bay	-19	135	23.45	-0.4
Sorell	-6	52	12.07	-0.1
Tasman	-8	95	17.85	-0.1
Total	**-216**			**-3.9**

Source: Point Advisory - derived from Table 4 1 and Indufor cost assumptions

Table 4-7: Loss in Harvesting Turnover Associated with No Log Exports from Hobart Port Post-2028

Local Government Area	Decrease in Harvest Volume from 2028 (000t/year)	Decrease in Harvesting Turnover ($M/year)
Central Highlands	-35	-0.9
Derwent Valley	-31	-0.8
Huon Valley	-60	-1.5
Sthn Midlands	-63	-1.6
Glamorgan/ Spring Bay	-21	-0.5
Sorell	-32	-0.8
Tasman	-29	-0.7
Total	**-271**	**-6.8**

Source: Point Advisory - derived from Table 4 1 and Indufor cost assumptions

On a net present value basis:

- The additional haulage costs to 2027 result in a net economic gain of $35 million
- This gain is offset by the decline in the forest estate area post 2028 resulting in:
    - Declines in the cost of wood transport to Bell Bay -$11 million
    - Additional cost of log transport to Bell Bay -$24 million
    - Decrease in harvesting turnover -$43 million.

Collectively these changes result in net reduction in direct harvesting and transport activity of - $43 million

4.4.6 Impact on Forest Estate Values

The absence of a hardwood chip market in southern Tasmania already has a negative impact on hardwood asset values in the region as a significant proportion of the volume produced is transported north to Bell Bay.

Softwood plantation asset values are less affected as pulpwood can be processed within the region. Softwood log exports are currently at much reduced levels due to the Chinese ban on Australian log imports. However, softwood log export volumes are slowly increasing as alternative markets are found. Over the long-term these markets are expected to recover.

The most significant impact on asset values if Hobart Port is not available for log exports is likely to be associated with the additional transport cost to Bell Bay. Table 4-8 highlights the net present value of the additional transport cost to redirect export logs from Hobart Port to Bell Bay less volumes assumed to be diverted to domestic markets (primarily softwood pulpwood).

It shows that at current levels of supply, diversion to Bell Bay would cost an additional $6.5 million/year. Post 2028, the estate size declines and the volume assigned to Hobart Port declines dramatically as wood flows from the southern LGA's declines. The subsequent fiscal impact of additional transport becomes more muted representing an additional cost of $2.8 million/year.

On a net present value basis, the diversion of log exports from Hobart Port would potentially reduce asset values in southern Tasmania by around $80 – $100 million if it occurred immediately, or $35-$47 million post 2028. This represents a material impairment on asset value as evidenced by publicly reported forest asset values.

On a comparative basis the value of STT's biological assets for all of its Tasmanian forests in 2019/20 was $183.3 million (Sustainable Timber Tasmania 2019/20 Annual Report, 2021). New Forests acquired the forest and freehold land assets from Norske Skog in 2020 for $62.5 million. These represent the two largest forestry assets in southern Tasmania.

Table 4-8: Impact of Redirecting Log Exports from Hobart Port to Bell Bay

		To 2027		From 2028	
Local Government Area	**Additional Haul Cost to Bell Bay ($/t)**	**Assumed Redirected to Bell Bay (000t/year)**	**Change in Haulage Cost ($M/year)**	**Assumed Redirected to Bell Bay (000t/year)**	**Change in Haulage Cost ($M/year)**
Central Highlands	-10.62	79	-0.8	48.4	-0.5
Derwent Valley	-30.78	50	-1.5	9.7	-0.3
Huon Valley	-37.38	72	-2.7	46.5	-1.7
Sthn Midlands	-19.90	27	-0.5	7.1	-0.1
Glamorgan/ Spring Bay	-7.20	22	-0.2	13.4	-0.1
Sorell	-29.93	10	-0.3	0.3	0.0
Tasman	-31.15	13	-0.4	0.8	0.0
Total		**273**	**-6.5**	**126.6**	**-2.8**

Source: Indufor

The fiscal impact associated with a reduction in the overall estate value as land moves out of forestry is less straight forward to quantify. Arguably at a stand level there is no value change once the existing tree crop is harvested as there is no subsequent tree crop to attribute any value to. However, the overall value of the regional estate would decline as mature areas are harvested and not replanted.

4.4.7 Likelihood of Replanting

To assess the likelihood of replanting Indufor assessed the Internal Rate of Return (IRR) using a single hectare model based on the following standard hardwood pulpwood regime costs:

- Establishment costs of $2,000/ha
- Annual administration, maintenance and protection costs of $90/ha/year. This represents a low cost, low input management structure
- A 16 year rotation yielding 225 tonnes/ha at harvest
- Harvesting costs of $25/tonne
- Transport costs to Hobart Port and Bell Bay as shown in Table 4-5
- Roading and harvest supervision costs of $4/tonne.

An IRR matrix was developed based on:

- Wharf gate prices of $70/tonne, $80/tonne and $90/tonne for hardwood pulpwood. This represents a typical price range for hardwood pulpwood over the course of a price cycle
- Cartage costs were weighted assuming: no Hobart Port supply, 35% Hobart Port supply (reflecting current levels but incorporating improvements to genetics and silviculture) and 100% Hobart Port supply (reflecting a more conventional supply chain where the resource is located within 150 km of primary end markets.

The analysis does not take into account land acquisition or land occupation costs. Additional costs would reduce the IRR further. However, there is scope for these costs to be partially offset by capital gains in land value over time.

Table 4-9: Internal Rate of Return for Second Rotation *E. nitens* Tree Crop Assuming Different Levels of Log Supply to Hobart Port

Scenario	Hardwood Log Export Price (A$ AWG/tonne)		
	70	80	90
No Log Export from Hobart Port	< 5%	<5%	<5% - 6%
35% Volume Exported from Hobart Port	< 5%	<5%	<5% - 7%
100% Volume Exported from Hobart Port	< 5% - 5.5%	5% - 8%	7.5% - 10%

Source: Indufor based on standard industry prices and costs – yellow shows insufficient expected return, green shows potentially sufficient expected return

The results in Table 4-9 show:

- Where there is no supply to Hobart Port, the IRR remains less than 6% for all options, even under the favourable price scenario. It highlights that unless there is an obligation to replant, growers would be highly unlikely to invest in a second rotation
- Under a more conventional market supply arrangement with 35% of the harvest volume going to Hobart Port, the IRR is more positive when the price exceeds $90/tonne
- The IRR of replanting based on the assumptions of 100% of log supply being exported through Hobart Port is consistent with other major hardwood plantation regions in Australia. The difference between 100% and the 35% supply scenario reflects the opportunity cost associated with the lack of a chip export facility in southern Tasmania. It also highlights the importance of Hobart Port for reinvestment. These returns could also potentially be realised if there was further domestic processing of plantation logs within southern Tasmania.

The decision to replant could be further enhanced if carbon credits were available for the transition from short rotation to long rotation forestry under the existing approved Plantation Forestry Methodology within the Emissions Reduction Fund.

4.4.8 Impact on Employment

Employment in the forestry industry is directly linked to the woodflow activity, as labour is required to grow, harvest, process (primary processing), transport and replant or regenerate.

It is difficult to say whether some companies would close operations in Tasmania as a result of a cessation of log exports from Hobart Port, as many factors will come into play, hence it is assumed that the overall employment impact for southern Tasmania directly aligns with the decrease in harvest volume post 2028, and results in a loss of 20% of direct forestry employment, i.e. a loss of 75 jobs overall[3].

In addition to the overall impact calculated above (75 jobs in direct forestry employment), the projected decrease in wood production across southern Tasmanian forestry estates could impact on indirect jobs, leading to a further loss of 36 indirect jobs[4].

Regional Impacts

Potential local level impacts (at the LGA level) are estimated in a section below. The rationale for looking at different regions is:

- The discrepancy in likely impacts by LGA
- The varied significance of forestry at the regional level.

Table 4-10: Post-2028 Projected Woodflows per LGA With and Without Access to Hobart Port

Local Government Area	Wood Production with Hobart Port (000 t/year)	Wood Production without Hobart Port (000 t/year)	Difference (000 t/year)	Difference (%)
Central Highlands	436	401	-35	-8%
Derwent Valley	345	314	-31	-9%
Huon Valley	250	190	-60	-24%
Kingborough	3	3	-	0%
Sthn Midlands	115	52	-63	-55%
Glamorgan/ Spring Bay	99	78	-21	-21%
Sorell	44	12	-32	-73%
Tasman	50	21	-29	-58%
Clarence	5	5	-	0%
Brighton	1	1	-	0%
Glenorchy	-	-	-	0%
Hobart	-	-	-	0%
Total	**1 348**	**1 077**	**-271**	**-20%**

Source: Derived from Table 4 1

As shown in Table 4-10, post-2028, under a scenario where there are no log exports from Hobart Port, there could be significant regional differences in changes to wood production.

[3] Based-off National Institute of Economic and Industry Research (NIEIR) Full-Time Employment Data for the Forestry and Logging industry in Southern Tasmania, indicating 380 FTE for Southern Tasmania, including Hobart.
[4] Indirect employment in forestry and logging calculated from multipliers determined from the ABS Census Data 2016.

Some LGA's are forecast to experience significant declines by more than half the wood production while other LGA's might experience little or no impact:

- Eight of the twelve LGAs in southern Tasmania are projected to experience a decline in wood production from 2028
- The Sorell LGA is expected to experience the largest decline in wood flows under a scenario where Hobart Port is not available for log exports beyond 2028 with a projected decline of almost three quarters (72%) of total wood production per year
- Tasman and the Southern Midlands LGA's are projected to see more than half of their wood production (59% and 55% respectively) disappear with no log exports through Hobart Port. Notably, the Southern Midlands LGA would experience the greatest decrease in wood production when measured in absolute terms
- The Huon Valley and Glamorgan-Spring Bay LGA's are projected to see somewhere between a fifth and one quarter of woodflows (24% and 21% respectively) disappear with no log exports through Hobart Port
- The Clarence, Brighton and Glenorchy LGA's experience little impact as they have very small forest areas.

The main concern related to this decline would be in local employment, mostly due to growing, tending and harvesting forests. Sources disaggregating forestry employment at a local level are not fully aligned. Table 4-11 therefore presents a range of impacts on direct employment at the LGA level, based on two recent sources, for two different dates. The assessment focuses only on forest growing, harvesting and haulage jobs. It excludes any impact on secondary processing jobs as the logs are exported in raw form rather than being processed domestically.

Compared to the regional assessment of 111 jobs lost (75 direct and 36 indirect), the LGA level analysis using the Schirmer *et al* 2018 data shows a similar result with estimated job losses of 99 – 103 at a LGA level. A lower number is identified using the NIEIR data at a LGA level as some LGA's with forests such as the Southern Midlands do not identify any forestry and logging jobs, which understates the impact.

Table 4-11: Regional Employment Impacts

Local Government Area	Schirmer Industry Survey (2018) – Total Forestry Jobs (incl Secondary Processing)	NIEIR – Forestry and Logging Jobs (2019/2020)	Projected % Change in Wood Production
Central Highlands	44/40	12/11	-8%
Derwent Valley	252/229	144/131	-9%
Huon Valley	171/147	60/51	-24%
Kingborough	110/103	7/6	6%
Southern Midlands	32/14	0	-55%
Glamorgan-Spring Bay	6/4	7/5	-21%
Sorell	36/10 (combined with Tasman)	8/2	-72%
Tasman	36/14 (combined with Sorell)	0	-59%
Clarence	115	0	0%
Brighton	81	7	0%
Glenorchy	133	6	0%
Hobart	203	128	0%
Total	**1,182**	**379**	
Projected loss of jobs without Hobart Port	**99-103**	**32**	

Source: Table 4-1; and National Institute of Economic and Industry Research (NIEIR), 2020, Full-Time Employment Data for the Forestry and Logging industry in Southern Tasmania; and Schirmer et al, 2018, Socio-economic impacts of the forest industry Tasmania

4.4.1 Overall Economic Direct and Indirect Impact to Southern Tasmania

The previous sections have disaggregated the possible direct impacts associated with being unable to export logs from Hobart Port on the economic output and employment or various components of the forestry industry in southern Tasmania.

It is difficult to assess indirect impacts of these changes, given the long timeframe of the change and the multiple factors influencing the capacity of the industry to adapt. As described in the scenarios, this could include reallocation of woodflows to local processing, which would have a different contribution to the Gross Regional Product (GRP) than log exports, with a greater portion of added value retained in Tasmania (but on a reduced volume).

Caution is always recommended when applying economic multipliers, especially on small scale economic shocks, as is the case in the scenario of log exports ceasing. Nevertheless, to assess what these impacts could be, multipliers derived from Schirmer *et al*., 2018 can be used, using the highest level economic outputs as a reference, to avoid double counting the impacts on harvesting and haulage that have been disaggregated above. Therefore the estimates presented below should not be additive to the disaggregated impacts noted in previous sections. Rather, they provide an alternative approach to estimating economic impacts.

Table 4-12 summarises the application of these multipliers, noting that the data used as a basis dates back to 2016/17 and may not reflect the structure of the forestry industry in the region, as it stands today. The estimates show that the $31.1 million/year decrease in net economic output calculated above could translate into a direct GRP decrease of around $9 million/year, plus an additional indirect negative impact of around $7 million/year, i.e. an overall negative impact of $16.2 million/year on GRP post 2028.

The positive impact resulting from greater harvest and haulage turnover to 2027 has not been calculated, as it represents a cost to forest growers.

Table 4-12: Impact on Gross Regional Product (Southern Tasmania)

Total economic value impact	$M/year	Source	Calculation
Net economic output	-31.1	As per table 4-3	
Corresponding GRP (direct)	-9.1	Extrapolated from Schirmer, 2018, table 3, page 17, Southern region	= 69.4/237.8 = 29% of output
Consumption-induced GRP (indirect)	-7.1		= 54.4/69.4 = 78% of direct GSP
Total direct + indirect GRP	-16.2		

Source: Point Advisory, Schirmer *et al* 2018

On a comparable basis, the net present value of the economic impacts as assessed using the direct and indirect multiplier approach is $101 million.

This estimate reflects an alternative approach to estimating the economic impact of a cessation of log exports through Hobart Port and is not additive to the disaggregated approach described in previous sections.

4.4.2 Summary of Economic Impacts

Hobart Port represents an increasingly important part of the supply chain in southern Tasmania. By volume it represents the third largest market after Norske Skog and Bell Bay based on the 2019/20 volume of 295 000 tonnes of logs exported from the port.

Log exports from Hobart Port provide a significant source of revenue for industry worth $27.3 million/year. On a net present value basis this equates to gross revenue worth $341 million to growers on a perpetual basis before accounting for production costs relating to harvesting and transport.

The main impact that can be expected from any cessation of log exports from Hobart Port is a drop in overall exports of logs from Tasmania and an increase in transport costs. Forest growers

in southern Tasmania would therefore be less likely to replant harvested trees if Hobart Port were not available.

One approach to assess the economic impact considered both the direct and indirect impacts associated with a cessation of log exports from Hobart Port. It showed the net present value of the economic impact would be a loss to the forest industry of around $101 million.

Any cessation in log exports would not have an immediate cataclysmic impact on the industry as the supply chain has the capacity to buffer the change via established routes to Bell Bay. These supply chains are relatively efficient and cost effective with adequate capacity to cater for additional growth in supply.

However, growers would be adversely affected from a cessation of log exports both in terms of stumpage (returns to the grower) and asset value. This would most likely result in the progressive liquidation of the existing tree crop with land converted to alternative land uses.

The impact of this decline on the forest industry would become more severe over time affecting:

- The viability and depth of the contracting sector
- The ability to attract new investment
- The capacity of the remaining growers to withstand periodic downturns in the export market, which tends to be cyclical.

A decline in the level of plantation re-establishment would result in a net loss of forest area for Tasmania and therefore correspond to a potential increase in carbon emissions.

Table 4-13: Summary of Employment and Economic Impacts Associated with Cessation of Log Exports Through Hobart Port

Operations	Employment Impact	Economic Impact on a Net Present Value Basis
Forestry estates	Loss of 75 direct jobs and 36 indirect jobs (post 2028) in the forest management, harvesting and transport sector	Declining southern Tasmanian plantation estate due to low likelihood of replanting resulting in: • A net decrease in the value of sales from 2028 of $195 million • An overall reduction in forest asset values in southern Tasmania by up to $35 – $40 million
Harvesting and haulage		Haulage industry pre-2027 increased revenue of $35 million due to transport to Bell Bay rather than Hobart Port more than offset by post-2028: • $43 million loss to the harvesting industry • $35 million loss to the haulage industry Collectively this results in an overall net loss to the forest industry of $43 million over a 30 year timeframe
Domestic processing	Unknown from increased volume of local processing of 102 000 tonnes of pulpwood	Value-add from the processing of 102 000 tonnes of pulpwood
Regional impact	Loss in forestry employment ranging from 8% to 72% depending on the LGA (post 2028)	The regional impact is the loss of output from the forestry estates and the loss of harvesting and haulage post-2028, partially compensated by the pre-2027 gain for additional haulage to Bell Bay
Port operations	Loss of 25 direct jobs in Hobart (with some transfer to northern Tasmania)	Pre-2027 port costs are neutral with operations occurring via Bell Bay rather than Hobart Port Post 2028 lower harvest volumes result in a net loss of income of $36 million

5. INFRASTRUCTURE OPPORTUNITIES IN SOUTHERN TASMANIA

This section outlines a range of infrastructure constraints and the potential pathways to reduce the impact of some of these constraints. Where the infrastructure constraint occur across multiple jurisdictions, it is identified separately. Where it occurs within a discrete LGA, then it is identified at this level.

5.1 Infrastructure Constraints and Pathways for Improvement

5.1.1 Rail

The rail link between Brighton and Bell Bay is currently confined to hardwood pulpwood sourced from native forests and hardwood plantations as the two operational sidings at Bell Bay are within the Artec and Reliance Forest Fibre woodchip facilities.

The mainline generally runs through undulating country however a significant range of hills between Brighton and Ross, including a 1 200m long tunnel near Rhyndaston and a series of sharp curves, sets the ruling grade load for locomotives on the network (Parsons Brinckerhoff, 2016).

Based on the network alignment and locomotive haulage capacity, a single TR Class Locomotive can haul ~532 tonnes of logs (~14 log wagons) from Brighton. Therefore, a log service departing Brighton with two TR Class Locomotives can haul ~1,110 tonnes of logs (~30 log wagons) to Parattah.

The ex-Brighton/Parattah to Bell Bay service currently operates daily six days per week, with 23 wagons representing the average daily wagon usage. This equates to 138 wagons or 5 244 tonnes/week at maximum usage. On an annualised basis (49 weeks) this equates to capacity of approximately 257 000 tonnes/year. The increase in volume from previous years reflects TasRail's commissioning of the Parattah Rail Siding in 2020. (Rolley, 2018) identified the Parattah Rail Siding as an important piece of the supply chain infrastructure for the efficient transportation of hardwood pulp logs sourced from south east Tasmania to Bell Bay.

Due to a length constraint in the siding at Bell Bay, a maximum of 23 log wagons can currently deliver ~874 tonnes of logs. TasRail is about to lengthen the 'run around loop' at Bell Bay, that would theoretically allow up to 48 log wagons to be efficiently shunted into the Artec and RFF sidings which would deliver 1 824 tonnes of logs per daily service – assuming sufficient wagons were available for the service. In practice, TasRail aim to deliver up to 30 wagons per day, which will be a function of available wagons and market demand at the time.

Discussions with TasRail identified that its strategic objective is to grow and diversify its forestry customer base. To increase log haulage capacity, TasRail requires additional intermodal wagons (used to transport Logtainer units). TasRail advise that each new intermodal wagon costs between $140 000 – $170,000 (depending on the number of units purchased and prevailing exchange rate).

Each additional log wagon adds ~11,000 tonnes/year of haulage capacity to Bell Bay. TasRail also noted that to add one additional wagon to the existing service, two new wagons must be ordered because for each wagon that departs north, a matching unit must be travelling south to ensure a wagon is presented at the loading face each day. Therefore, to add a wagon of capacity ex Brighton or Parattah, two new wagons must be purchased.

During the consultation process it was noted that the Brighton yard can sometimes become a bottleneck requiring surplus volume to be transported to Parattah. This can occur when stockpiles at the receival facilities reach capacity (due to delays in shipping schedules) or have mechanical breakdowns. Once at capacity these facilities can no longer accept logs which has a ripple effect down the supply chain. In this instance the Brighton yard also reached capacity and the Parattah Rail Siding was used as a buffer to store additional volume. TasRail noted that its log yards provide a buffer for storage capacity across the supply chain. TasRail is currently seeking to expand the capacity of the Brighton log yard through the addition of book ends that

allow log stacks to be stacked to a higher level. The acquisition of the bookends is being funded via the Tasmanian Government's Forestry Stimulus Package.

TasRail currently has significant capital funding of over $200 million from the Federal and State Governments over the forward estimates (until 2023/24) for additional below rail and above rail improvements to its infrastructure that should further improve both its capacity and operating efficiency. The risk of derailment and the associated delays to the efficient movement of logs represents an ongoing risk to TasRail. Continued investment in the rail network is a critical requirement to minimise the risk of derailment.

TasRail has a range of projects it is investigating as part of its assessment of strategic opportunities to potentially its capacity per train as well its areas of operation. These are discussed in more detail in Section 5.2.

5.1.2 State Highway Network

The Hobart to Burnie corridor is the most significant transport route in Tasmania. The State Government is currently undertaking a substantial upgrade of the Midland Highway with planned expenditure of $500 million on a range of safety and debottlenecking upgrades along the length of the highway. This was raised as a critical piece of infrastructure investment by both growers and processors who rely on it for transporting goods.

Barriers to the Utilisation of A-doubles

The highway between Bell Bay and Brighton and Bell Bay and Burnie has been classified by the National Heavy Vehicle Regulator as being suitable for Class 2 A-double vehicles. Under GML a 12 axle A-double has a mass limit of 82.5 tonnes, compared to 62.5 tonnes for a 9 axle B-double and 42.5 tonnes for a 6 axle semitrailer. This provides the opportunity for a step change improvement in road efficiency. This means a B-double would require 32% fewer trips and an A-double 55% fewer trips to deliver the same mass compared to using semitrailer trucks.

A-doubles would provide an alternative to rail to deliver logs from a centralised log yard at Brighton to Bell Bay. It is not currently a viable option for transport directly from the forest. Centralised transport would involve double handling which would need to be lower than the alternative approach of using high productivity vehicles travelling from the forest directly to Bell Bay.

A-doubles would be well suited to the movement of finished goods along the main freight network.

During the consultation process Indufor discussed the use of A-doubles with several transport operators who had either used or were considering using A-doubles. The feedback was that while the network was mostly able to cope there were some barriers:

- Weight restrictions on the Perth Bridge and Launceston Bridge meant the trucks could not travel fully loaded
- A-double trucks cannot get further south than the Bridgewater Bridge with loads greater than 68 tonnes. Consequently, truck combinations need to be broken up and reassembled to cross this point, adversely affecting the productivity benefits of the vehicles
- A-double trucks can only travel at 90km/hour whether empty or loaded
- The vehicles were not allowed to deviate from the gazetted route and had to apply for a permit, even for vehicle servicing.

The combination of these factors negated the benefit of being able to increase payload and the trucks are currently not in service.

Another limitation raised during the consultation was the maximum length limits of 30.2m for A- doubles in Tasmania which limit the axle groups under some configurations. This is currently being reviewed by DSG with options being considered to extend the maximum length to 32m or to 35m. The extension to a maximum length of 35m would allow a dual axle dolly[5] to be replaced with a tri-axle dolly and would allow the gross mass limit to increase to 92 tonnes.

The Bridgewater Bridge is currently in the process of being replaced with the Federal and State Government committing $576 million to the project. In December 2020 DSG engaged two contractors to undertake a competitive design and tendering process. Construction is scheduled to commence around mid-2022 (Hobart City Deal - New Bridgewater Bridge Project, 2021). Table 5-1 identifies the bridges that are currently limited for A-double access. DSG advise this is slightly out of date as some bridges have been strengthened in recent months.

Table 5-1: Conditionally Approved Structures for A-Double Truck Access Located Between Hobart and Bell Bay

Structure Name	Weight limit (t)	Asset Owner	Road	Access	Planned Upgrades
Bridgewater Bridge	68.5	State Growth	Midland Highway	Conditionally approved	Yes (current)
Euston Street Underpass	80.5	State Growth	Brooker Highway	Conditionally approved	No
Jordan River Bridge	81.0	State Growth	Midland Highway	Conditionally approved	Yes (2018/19)
South Esk River Bridge	79.0	State Growth	Midland Highway	Conditionally approved	No
Flyover Bridge 690	80.5	Launceston City Council	Wellington Street	Conditionally approved	No
Bridge 684 Victoria	81.5	Launceston City Council	Tamar Street	Conditionally approved	No
Bridge 685 Charlelower	79.5	Launceston City Council	Lower Charles Street	Conditionally approved	No
Landfall Overpass	73.0	State Growth	George Town Road	Conditionally approved	No

Source: DSG

DSG intend to progressively upgrade these bridges over time to allow unrestricted A-double access over these key transport routes. However, a timeframe or costings for these improvements has not yet been announced.

Heavy Vehicle Driver Rest Areas

During the consultation process one transport operator identified a lack of driver rest areas as an important safety issue that requires addressing. Managing driver fatigue is a core part of a transport company's health and safety program. Tasmania's Integrated Freight Strategy projects a 36% increase in road freight demand over the next 20 years.

Indufor was advised that there are no suitable truck laybys between Huonville and Hobart and only one along the Midland Highway, which is located on private property at Epping Forest Road. This makes the management of driver fatigue challenging as driver breaks need to be scheduled in informal areas that are not designed for that purpose and can lack essential amenities.

[5] A dolly is an unpowered vehicle designed for connection to the prime mover

In August 2020 DSG published the Tasmanian Heavy Vehicle Driver Rest Area Strategy. The strategy outlines a long-term approach to planning and investment in facilities that support the road transport freight task. In 2020 the Tasmanian Transport Association (TTA) produced The Tasmanian Heavy Vehicle Driver Rest Areas Project Report. It identified that the current facilities available for heavy vehicle drivers to take breaks, rest, and undertake vehicle and load checks fell short of the recommendations in the newly released Austroads Guidelines (Department of State Growth - Tasmanian Heavy Vehicle Driver Rest Area Strategy, 2021).

The strategy identified the following sites for the route between Launceston and Hobart:

- Establishment of a 20 heavy vehicle stop with amenities between Campbell Town and Oatlands which would be duplicated for north and south bound traffic
- For south bound traffic
    - Southern Outlet North of Kings Meadows Link - extend and widen to provide parking for five heavy vehicles
    - Pontville – extend and widen to provide parking for 10 heavy vehicles
    - Spring Hill/ St Peter's Pass/ Campbell Town weighbridge - extend and widen each to provide parking for five heavy vehicles
- For north bound traffic
    - Establish a new site between Hobart and Kempton
    - Spring Hill/ St Peter's Pass - - extend and widen each to provide parking for five heavy vehicles.

It also identified routes on the Lyell Highway between Queenstown and Hobart

- A duplicated east/ west stop at Ouse for five heavy vehicles with additional duplicated sites between Ouse and Bronte Canal and Queenstown and Derwent Bridge/Broken Leg
- For east bound traffic
    - Between Ouse and Hobart and Broken Leg – extend and widen to provide parking for five heavy vehicles each
- For west bound traffic
    - Broken Leg, Hayes Weighbridge, Derwent Bridge – extend and widen to provide parking for five heavy vehicles.

The Strategy clearly articulates the steps being taken to address these issues but the Strategy does not identify a funding pathway. DSG advise that no immediate projects have been funded but stimulus funding of $5 million over the next two financial years is available. Using this funding source DSG has identified two locations: East of Burnie (Howth) and the East Tamar Highway south of Georgetown (Bridport Road junction) to construct heavy vehicle rest areas. This funding is expected to be sufficient to allow DSG to develop 20 concept designs for future funding submissions.

As part of expanding and implementing this program DSG is seeking to enter into the planning process for capital works to integrate HVRA into a range of road improvement programs. It is also investigating the scope to retrofit HVRA into the late stages of planning for existing projects to allow a more rapid rollout of these areas.

5.1.3 Replacement of TasPorts Bell Bay Ship Loader

Bell Bay is one of two major woodchip export facilities in Tasmania, the other is located at Burnie. Ships entering the Tamar River can be loaded from two berths: the Long Reach chip berth is privately owned and operated by Forico; the other berth is located at Bell Bay and is owned by TasPorts.

The ship loading facility represents the end point of the domestic pulpwood supply chain, with supply from southern Tasmania making a material contribution to the throughput at Bell Bay. Each of the three wood chipping operations at Bell Bay rely on the TasPorts ship loader to load vessels.

The current ship loader was commissioned in 1990 and during the consultation process concerns were raised about its age and TasPorts intentions on a timeframe to replace it. The risk to the industry is that the ship loader suffers a catastrophic failure which would cause a significant disruption to the entire supply chain, including southern Tasmania. Depending on how long it would take to remedy a failure, the lack of alternative markets in this scenario means ongoing production, particularly of high quality sawlogs would be challenging if there was no access to the ship loader for a prolonged period as there is no alternative outlet for hardwood pulpwood.

The timing for any replacement of the Bell Bay ship loader is a commercial decision for TasPorts and would need to be considered in the context of its overall multi-port capital expenditure program.

5.1.4 Identification of Infrastructure Constraints within Local Government Areas

Indufor applied the following approach to identify infrastructure constraints within southern Tasmania that impact on the efficiency of the supply chain.

- As part of the literature review Indufor assessed what infrastructure constraints have previously been identified and what actions might have occurred since that time
- The initial consultation with forest growers, processors and transport operators sought to identify any major supply chain infrastructure constraints and rank which was the highest priority. The responses tended to be general in nature, often suggesting that identifying gaps in the regional network would be useful, rather than identifying infrastructure constraints that are specific to their organisation. A few specific examples were raised and these have been incorporated into the analysis
- Based on this feedback, Indufor subsequently undertook a top down analysis of the spatial distribution of the forests overlaid with the load limits of the road network to identify the gaps in the B-double freight network. This was followed up with further discussions with DSG, local councils and growers that are active in each of the LGA's.

One particular challenge identified by several growers during the consultation process was that key limiting infrastructure often occurs in 'the first mile' either within the forest or on the public road that exits the forest and connects to the local council road or state highway. The dispersed nature of the forest resources, particularly in the south east, makes identification of broad scale infrastructure constraints challenging as these issues can be confined to a single plantation.

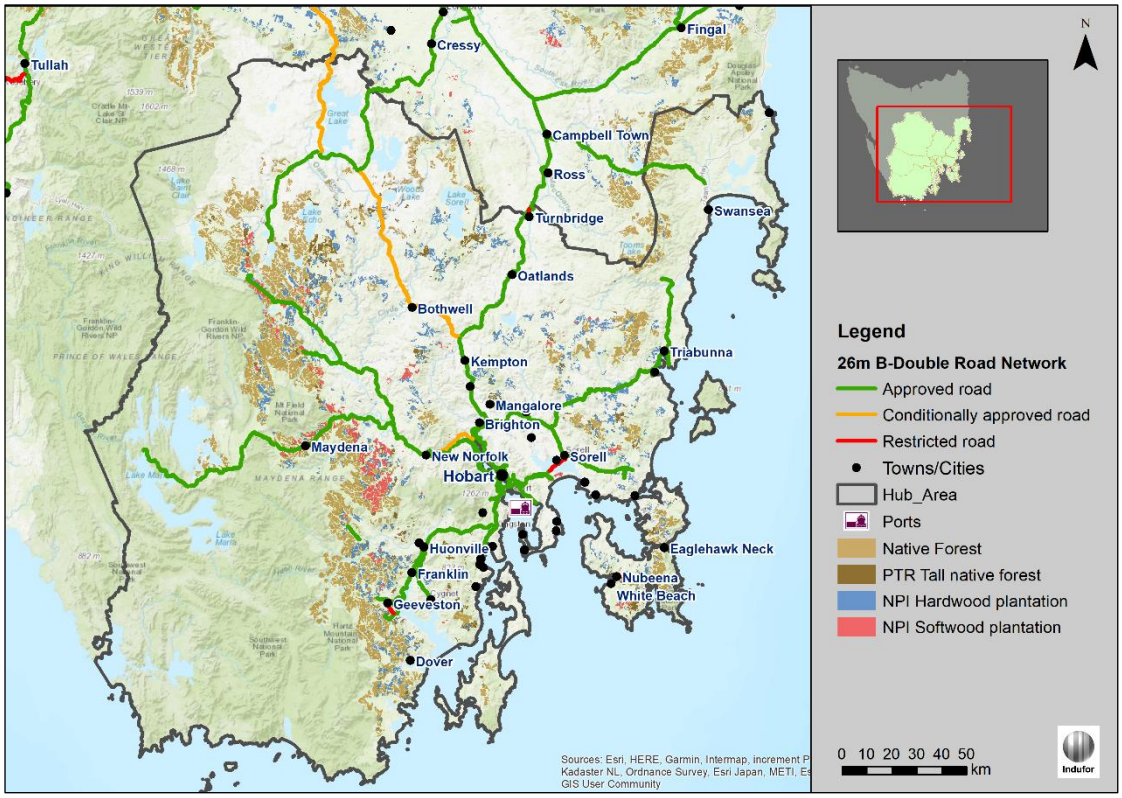
Road Network

In an ideal world, all roads would be designed and built to carry the maximum payload as efficiently as possible. In reality this is not the case as factors such as terrain, cost of construction and maintenance and the level of expected utilisation affect what quality of road is constructed.

Figure 5-1 shows the distribution of roads for B-doubles up to a maximum length of 26 m and 4.3 m overall height. This is the largest vehicle permitted outside of the Midland Highway where sections are approved for larger A-double trucks. The maximum load for 26 m B-double trucks is 59 – 62.5 tonnes for GML, 61 – 64.5 tonnes for CML and 62.5 – 68 tonnes for HML.

Lines that are green show the approved authorised network. Orange lines are conditionally approved routes but require the approval of the road manager for access by permit. Permit applications are managed by the NHVR who liaise with state and local government on conditions to apply (if any) to the permit. Red lines are restricted roads that are not authorised for 26 m B- double trucks.

Figure 5-1: Distribution of 26 m B-double Routes in Southern Tasmania



Source: DSG Transport Services - maps.stategrowth.tas.gov.au

One important limitation of this approach is that heavy vehicle permits granted outside of the state road network are not captured spatially. Therefore, to confirm the status of roads beyond those managed by DSG Indufor consulted with local councils and growers to discuss the areas of interest and try and identify these and any other key infrastructure issues and measures being taken (if any) to address them. DSG advised that it is currently undertaking a project to integrate council roads into the spatial representation of the state road network to provide a single source of data on public roads.

These gaps in the network data are examined at an LGA level in the following sections. Through this process it became apparent that most of the major infrastructure constraints are well known to industry and have been reviewed or addressed at a local level.

Roads identified as General Access (GA) typically allow for a mini (21 m or 23 m) B-double with a gross weight of around 57 tonnes or a 7 axle Truck and Dog configuration with a gross weight of around 50.5 tonnes.

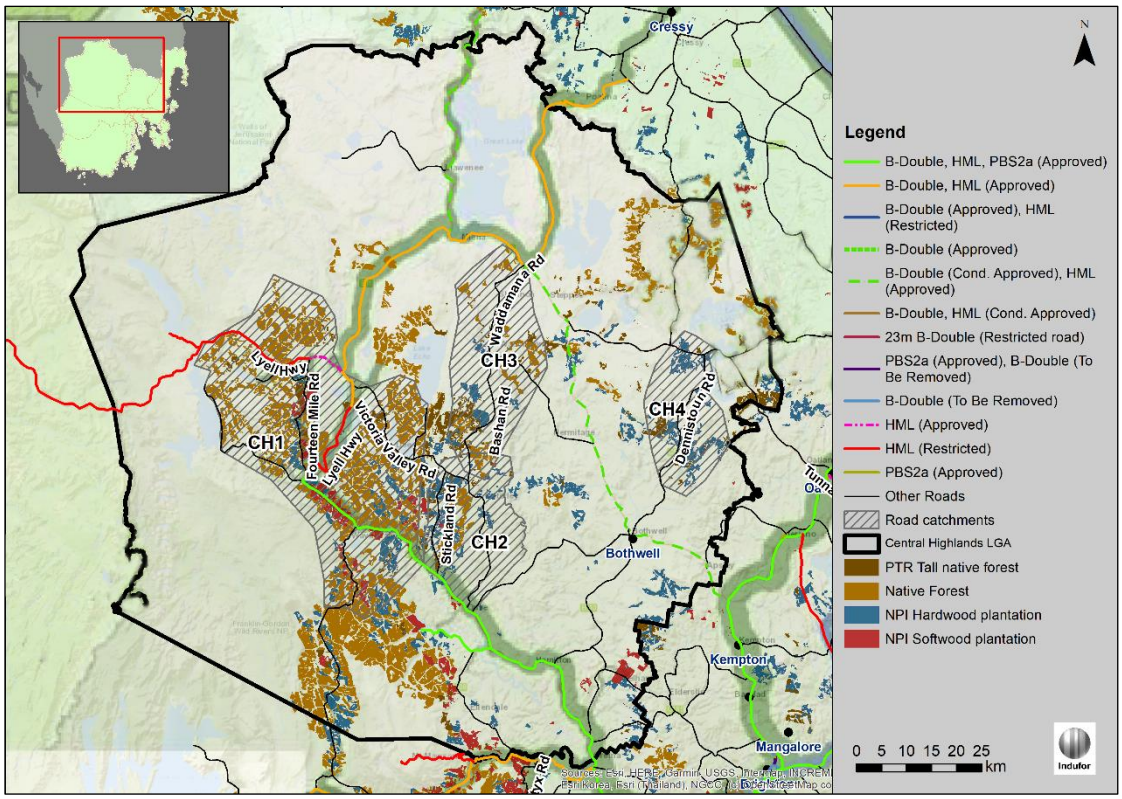
5.1.5 Central Highlands LGA

Despite having the largest forest area in southern Tasmania there is little domestic processing within the Central Highlands LGA. Pulpwood from native forests and hardwood plantations north of Ouse, typically is trucked north via the Lyell Highway or Fourteen Mile Road (west of the Lyell Highway), connecting with the Marlborough Highway onto either Highland Lakes Road or Poatina Road before travelling east to Bell Bay. This can be observed in the superimposed 2016/17 Tasmanian Freight Survey volumes shown in Figure 5-2 (heading north from CH1 and CH3).

Figure 5-2 indicates a load constraint (shown as a red line) occurs on the Lyell Highway around Tarraleah heading north and in an east-west direction from Queenstown. There are aggregations of forests east and west of the Lyell Highway where the status of the roads is not apparent.

Logs sourced from softwood plantations and hardwood or native forests south of Ouse generally travel south along approved 26 m B-double routes.

Figure 5-2: Potential Gaps in the B-double Network within the Central Highlands LGA



Source: NPI, STT, PFT, NHVR, DSG

Table 5-2: Key Roads within the Central Highlands LGA Aggregations

ID	State Highway	State Road Hierarchy	Council Road	Road Length (km)	Constraint - Consultation Feedback
CH1	Lyell - Tarraleah	3			GA limits due to grade and bridge restrictions over Serpentine River
			Fourteen Mile Rd	25	Alternative route to Tarraleah crossing
	Lyell –14 Mile to Marlb. Hwy	3			GA from Fourteen Mile Rd to Marlborough Highway bridge restrictions over Serpentine River
CH2			Strickland Road	23	Limited use
			Victoria Valley Road		26 m B-double capable
CH3			Bashan Road Waddamana Road	21 22	Infrequent use with most volume travelling over Victoria Valley Road
CH4			Dennistoun Road	21	Wood can travel south to Bothwell or north then east on Interlaken Road

Source: Indufor – industry consultation

Table 5-3 shows the forest distribution within each of the four forest aggregations that account for 55% of total forest area within the Central Highlands LGA.

Table 5-3: Forest Distribution within Supply Catchments with Potential Gaps in the Road Network

Road Catchment	Hardwood Plantation	Softwood Plantation	Native Forest	PTR (Tall Forest)	Total
	Area (ha)				
CH1	3 497	3 297	30 067	1 575	38 435
CH2	2 191	110	2 306	859	5 466
CH3	1 277	13	2 954	1 789	6 033
CH4	2 689	30	0	754	3 473
Catchment Coverage	**9 654**	**3 450**	**35 327**	**4 976**	**53 407**
CH Total	**18 564**	**6 370**	**61 570**	**10 068**	**96 571**
% Total LGA	52%	54%	57%	49%	55%

Source: ABARES, STT, PFT

Following the stakeholder consultation process Indufor understands the status of each of the key roads is:

- DSG have no existing plans to upgrade either the load limited road sections or bridges on the Lyell Highway. Permits for 23 m or 26 m B-doubles can be provided for short periods, but most access is GA HML
- Fourteen Mile Road is a council road rated for a quad truck and dog or HML mini B– double. The road is unsealed and with roadside tree canopy closure occurring in some place. One bridge has recently been upgraded but to GA not to a 26 m B-double standard
- Victoria Valley Road is a council road which is approved for 26 m B-doubles
- Strickland Road has a long standing agreement (over 30 years) between council and STT that trucks use the Dee Link Road as an alternative to Strickland Road. Council issues some permits but only to growers that must access Strickland Road from their forests. Dee Link Road is approved for 26 m B-double trucks
- Bashan Road/ Waddamana Road is used infrequently with all product travelling north. Insufficient volume to support upgrade beyond GA HML. Mini B-doubles can be used under permit conditions, but not as of right
- Dennistoun Road – rated GA for HML mini B-double. There is a preference for doing short runs to the Parattah Rail Siding rather than travelling to Bell Bay.

Options to address these potential constraints include:

- Given the gorge like nature of the terrain around Tarraleah, there is limited scope to upgrade this section of the Lyell Highway which includes several hairpin bends. Its continued use is due to the superior road surface and shorter distance compared to Fourteen Mile Road
- To be upgraded to a 26 m B-double standard Fourteen Mile Road would require substantial alignment and resurfacing work along its entire length. It also has several hairpins with a bridge at the apex of the hairpin. A 26 m B-double would take up whole existing bridge. The recently upgraded bridge was to a GA standard and would require significant realignment to be suitable for a 26 m B- double
- The section of Lyell Highway that connects Fourteen Mile Road to the Marlborough Highway is limited by a single span bridge over the Serpentine River followed immediately by a 90-degree turn. Both would require upgrading to allow a 26 m B-double. The road shoulders are also generally not considered suitable for a 23 m or 26 m B-double. However, permits are granted for 26 m B-doubles for short periods
- The remaining council roads are either already suitable for 26 m B-doubles or are likely to be used infrequently.

5.1.6 Derwent Valley LGA

Wood flows in the Derwent Valley are strongly influenced by regional processing infrastructure with softwood pulp logs travelling to the Norske Skog mill. Finished paper is containerised and travels by train from the mill to Burnie Port. Softwood logs are also exported through Hobart Port. Hardwood pulpwood is transported to Brighton or Bell Bay with hardwood peeler logs travelling to Hobart Port. Native forest sawlogs travel along different routes to various mills but as Figure 5-3 shows a significant volume travels over the Plenty Link Road to the Southwood mill in the Huon Valley.

(Rolley, 2018) identified the potential to upgrade the Plenty Link Road to allow lower grade logs from the Derwent and Huon Valley to be transported via a new single lane "freight only" bridge over the Derwent River to railheads at Boyer or Brighton for transport to Bell Bay. This route would cater for an estimated 240 000 - 400 000 tonnes/year. It would also improve the links for native logs heading south to the Southwood processing complex.

A major rationale for upgrading the link road would be to remove the bulk of log transport task from Macquarie and Davey Streets in Hobart providing social (reduced congestion) and environmental benefits.

Two feasibility studies were commissioned by the Derwent Valley Council (Jacobs - Southern Explorer Feasibility Study, 2015) and the Huon Valley Council ((Deloitte Access Economics - Upgrade of Jeffrey's Track, 2020) investigating the potential routes to connect the Derwent and Huon Valleys.

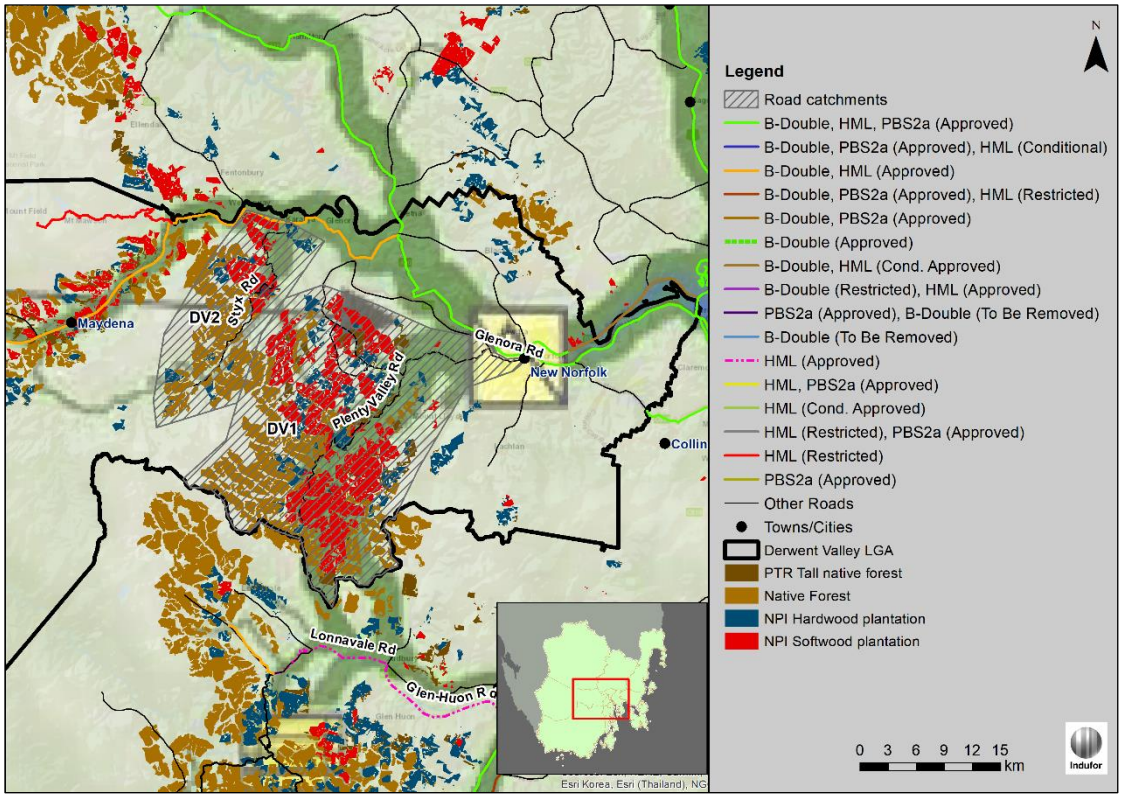
The Jacobs study notes that the Plenty Link Road is approximately 40km long, unsealed and has challenging geometry along much of its length. High Productivity Vehicles (68 tonnes) and mini B-doubles are able to use the road.

Jacobs used a cost benefit analysis to assess the merits of upgrading and sealing the road to an 8m width. It estimated a capital cost of $48 million was required to upgrade the road with annual maintenance costs of $387 000/year. The analysis concluded that freight demand of 250 trucks/day (1.8 million tonnes) would be required to justify the upgrade, which is far higher than the 20 trucks/day that were using the route at the time of the study. The 2010/11 Tasmanian Freight Survey showed the entire freight task for all industries along the Southern Outlet was 1 million tonnes.

The Deloitte's study examined two potential routes, White Timber Trail or Jeffery's Track, to connect Huonville to Lachlan. The report concluded upgrading either route for heavy vehicles is not viable due to the substantial cost, a lack of support from the community and industry, the potential environmental impacts, and likely low usage.

Figure 5-3 identifies two substantial concentrations of forest within the Derwent Valley. It highlights the importance of the Plenty Link Road and Glenora Road as being key routes for the supply of softwood logs to either Norske Skog or Hobart Port.

Figure 5-3: Potential Gaps in the B-double Network within the Derwent Valley LGA



Source: NPI, STT, PFT, NHVR, DSG

Table 5-4: Key Roads within the Derwent Valley LGA Aggregations

ID	State Highway	State Road Hierarchy	Council Road	Road Length (km)	Constraint - Consultation Feedback
DV1			Plenty Valley Road Glenora Road	38 4	Key arterial route for softwood pulpwood and native hardwood sawlogs
DV2			Styx Road		Road is rated for 26 m B-doubles

Source: Indufor – industry consultation

Table 5-5 shows the forest distribution within the two road catchment aggregations account for 65% of total forest area within the LGA.

Table 5-5: Forest Distribution within Supply Catchments with Potential Gaps in the Road Network

Road Catchment	Hardwood Plantation	Softwood Plantation	Native Forest	PTR (Tall Forest)	Total
	Area (ha)				
DV1	1 832	6 856	6 285	995	15 969
DV2	620	1 187	3 309	0	5 116
Catchment Coverage	**2 452**	**8 043**	**9 595**	**995**	**21 085**
DV Total	**4 557**	**9 709**	**16 627**	**1 707**	**32 600**
% Total LGA	54%	83%	58%	58%	65%

Source: ABARES, STT, PFT

Following the stakeholder consultation process Indufor understands the status of each of the key roads is:

- Styx Road is suitable for 26 m B-doubles which regularly utilise the road
- The Plenty Link Road which connects Plenty Valley Road and travels south to connect with Lonnavale Road is suitable for 26 m B-doubles and STT operate these to supply native forest sawlogs to the Neville Smith Forest Products sawmill at Southwood
- The Plenty Valley Road egress toward New Norfolk is currently rated GA HML allowing HML mini B-doubles.

Based on this feedback the primary infrastructure limits relate to the New Norfolk end of the Plenty Valley Road. Some of the factors requiring consideration include:

- A road upgrade would require improvements to road grade and design. There are several private residences along the road. In some instances, the dwellings are built into the side of the bank close to the road. This could potentially limit the scope for any further earthworks
- In the event the road is upgraded, there would be further difficulties in crossing the Derwent River. If travelling to New Norfolk, trucks would turn left at the roundabout to cross the river. There is currently a school adjacent to the roundabout. An alternative approach would be to travel away from New Norfolk to Bushy Park and cross the Derwent River there taking the Lyell Highway along the north bank to Boyer, an additional distance of 40km. This was one of the key issues identified in (Rolley, 2018). The report suggested the construction of a dedicated freight only bridge across the Derwent River to allow 26 m B-double to access the Lyell Highway. The need for a bridge was a key requirement as part of the Plenty Valley Road upgrade.

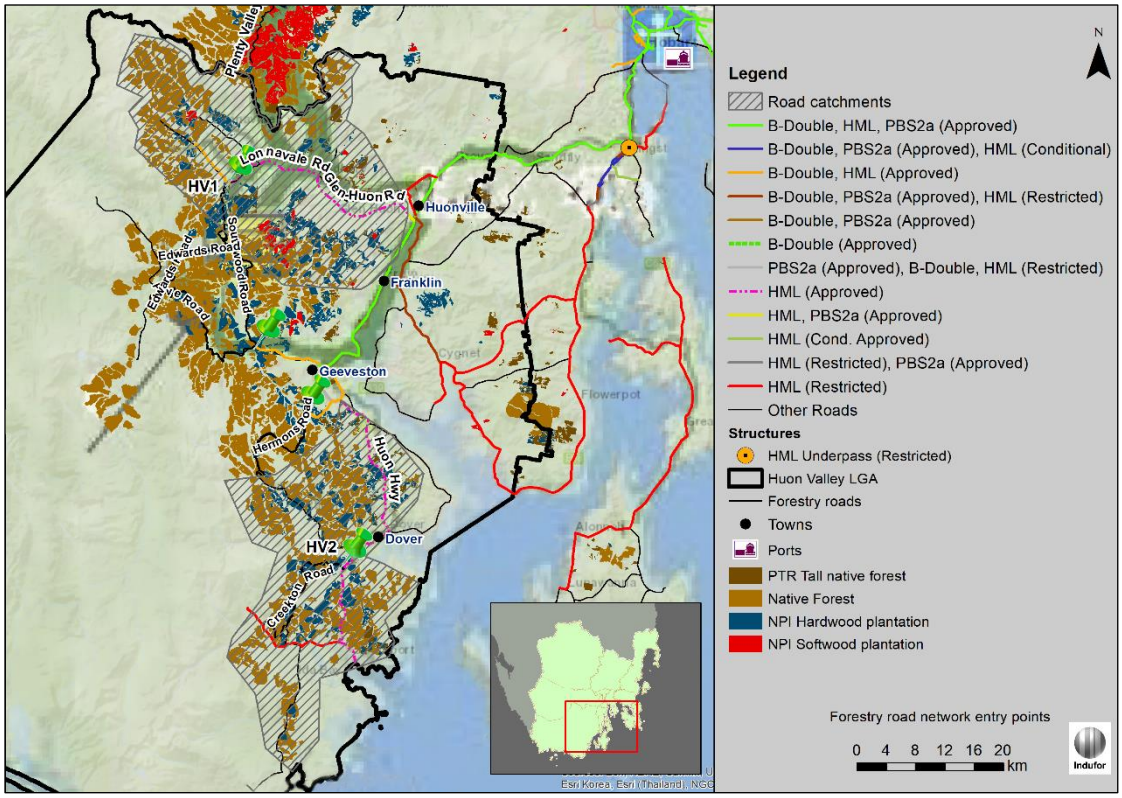
5.1.7 Huon Valley LGA

Transport from the Huon Valley has traditionally been dominated by supply from native forests with sawlogs and peeler logs (prior to Ta Ann's mill closure) transported to Southwood (see Figure 5-4).

The region also has a significant hardwood plantation resource which is split between short rotation pulpwood and long rotation high quality sawlog production.

Load restrictions are imposed on the Huon Highway south of Geeveston (Cairns Bay) as well as Glen Huon Road.

Figure 5-4: Potential Gaps in the B-double Network within the Huon Valley LGA



Source: NPI, STT, PFT, NHVR, DSG

Table 5-6: Key Roads within the Huon Valley LGA Aggregations

ID	State Highway	State Road Hierarchy	Council Road	Road Length (km)	Constraint - Consultation Feedback
HV1			Glen Huon Road* Lonnavale Road	16 15	Current council conditions prevent any log or woodchip transport on Glen Huon Road except to supply logs to the Glen Watson sawmill. Sawn timber can be transported over the road Lonnavale Road can take 26 m B-doubles from Plenty Link Road heading to Southwood
HV2	South of Geeveston (Cairns Bay)	3	Huon Hwy	44	The Huon Highway has a GA HML classification

* Council road managed by the Department of State Growth

Source: Indufor – industry consultation

Table 5-7 shows the forest distribution within each of the two forest aggregations that could benefit from an upgrade to the primary road. These two catchments account for 57% of total forest area within the LGA.

Table 5-7: Forest Distribution within Supply Catchments with Potential Gaps in the Huon Valley LGA Road Network

Road Catchment	Hardwood Plantation	Softwood Plantation	Native Forest	PTR (Tall Forest)	Total
	Area (ha)				
HV1	3 792	660	9 160	946	14 558
HV2	3 837	1	10 769	570	15 178
Catchment Coverage	**7 629**	**661**	**19 930**	**1 516**	**29 735**
HV Total	**11 526**	**868**	**36 766**	**2 810**	**51 970**
% Total LGA	66%	76%	54%	54%	57%

Source: ABARES, STT, PFT

Following the stakeholder consultation process Indufor understands the status of each of the key roads is:

- The ban on logs and woodchips using Glen Huon Road means logs are transported via STT's Forestry Roads to exit onto the Huon Highway at Geeveston. These roads can accept 26 m B-doubles, but the route adds approximately 20 -25 km to the travel distance
- Glen Huon Road has GA HML access. Road and shoulder widths are considered marginal as is the road curvature in sections. The bridge can accept 19 m GA vehicles or mini B-doubles (21-23m long)
- DSG advise it has no plans to upgrade Glen Huon Road
- The section of Lonnavale Road that heads toward Southwood from the Plenty Link Road is suitable for 26 m B-doubles. The section of Lonnavale Road that joins Glen Huon Road is managed by Huon Valley Council. The road is rated for GA HML vehicles
- The Huon Highway south of Geeveston has sections that are windy and narrow with no shoulder on either side of the road. There have been incidents with truck rollovers on this road in the past. The road also contains several longer bridges where two axle groups are on a single structure at the same time creating load limitations. The combination of these factors means the road is rated as GA HML with a gross load limit of around 50 tonnes
- There is a parallel network of STT's Forestry Roads that are suitable for 26 m B- doubles. DSG encourage transport operators to take full sized loads on these roads rather than GA HML on the Huon Highway. DSG does not have any immediate upgrade plans but the incoming government has committed to the development of a 10 Year Strategic Action Plan for the Huon Highway.

The main areas of opportunity for the Huon Valley region is to focus on the potential benefits associated with a road upgrade, particularly in relation to reducing the haulage distance The closure of the Ta Ann peeler mill means an increase in volume travelling from the Huon Valley region to other markets. The opportunity to utilise Glen Huon Road would provide significant economic benefits to growers in a region that is one of the most distant from pulpwood markets. Any incremental gain in reducing costs would result in a material increase in grower stumpage. This needs to be recognised in the context that such a change would require a significant change in long-standing council policy.

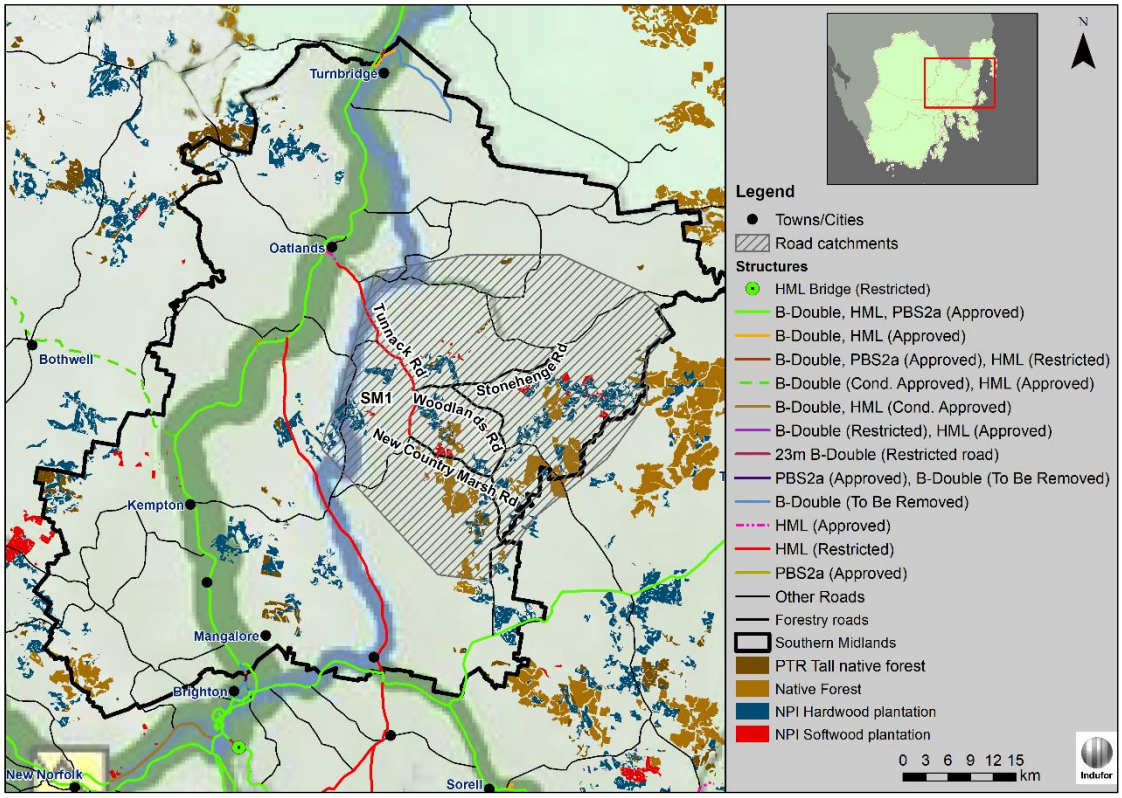
5.1.8 Southern Midlands LGA

The 2016/17 freight survey overlay shown in Figure 5-5 indicates there has been limited harvesting activity in the region. Hardwood plantations are likely to be first rotation ex-MIS established on agricultural land. During the consultation process it was noted that properties were often established without consideration of roading requirements at the time of harvest. This is now presenting a range of access challenges as these plantations mature.

(Rolley, 2018) identified the best option for hardwood pulp logs would be to transport them to Bell Bay via upgraded loading facilities at Parattah. TasRail completed the Parattah Rail Siding in 2020 and this route is now being used for forests across the south east.

In terms of road infrastructure Tunnack Road is the state road that connects a large aggregation of forests to the Parattah Rail Siding or the Midland Highway but has a load limitation. If addressed this would potentially open up the load limits of the four key Southern Midlands council roads as well as adjacent LGAs.

Figure 5-5: Potential Gaps in the B-double Network within the Southern Midlands LGA



Source: NPI, STT, PFT, NHVR, DSG

Table 5-8: Key Roads within the Southern Midlands LGA Aggregations

ID	State Highway	State Road Hierarchy	Council Road	Road Length	Constraint - Consultation Feedback
SM1	Tunnack Road	5	Tunnack Road, Woodsdale Road, Stonehenge Road, New Country Marsh Road	31 43 13 13	Tunnack Road HML restricted Council roads GA HML

Source: Indufor – industry consultation

Table 5-9 shows the forest aggregation accounts for 56% of total forest area within the LGA.

Table 5-9: Forest Distributions of Supply Catchments with Potential Gaps in the Road Network

Road Catchment	Hardwood Plantation	Softwood Plantation	Native Forest	PTR (Tall Forest)	Total
	Area (ha)				
SM1	4 204	511	3 554	516	8 785
Catchment Coverage	**4 204**	**511**	**3 554**	**516**	**8 785**
SM Total	**8 685**	**657**	**4 172**	**2 086**	**15 601**
% Total LGA	48%	78%	85%	25%	56%

Source: ABARES, STT, PFT

Following the stakeholder consultation process Indufor understands the status of each of the key roads is:

- Tunnack Road has a HML restriction at southern end of the State Highway. The road geometry and lane width limitations mean it is inadequate for a tri axle vehicle. The road can accommodate tandem axle vehicles, the largest allowable being a 23 m mini B- double with a gross load of up to 63 tonnes
- None of the council roads were constructed as forestry roads but are built to a GA heavy vehicle standard primarily for the movement of agricultural produce. Factors such as road design, alignment and pavement widths are most likely to be not suitable for longer 26 m B-doubles. However, haulage permits are currently allowing GA HML – using either a mini B-double or Truck and Dog configurations to travel from the south to Parattah or Bell Bay
- The Southern Midlands council advised that all bridges within the LGA network have been progressively upgraded over the past 25 years to the R44 standard
- Harvesting is currently active in the area with Stonehenge Road, Woodsdale Road, Tin Pot Marsh Road all being utilised for log transport.

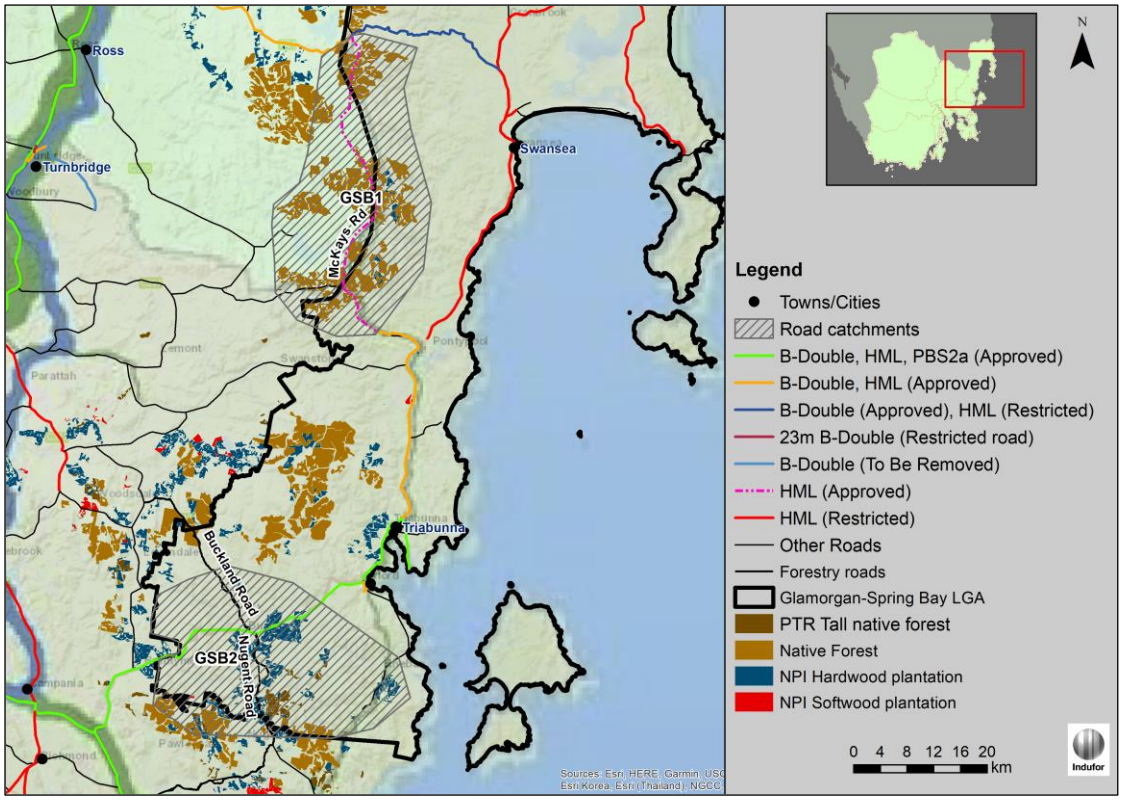
In terms of opportunities for infrastructure enhancement:

- The upgrade to the Parattah Rail Siding enhances the opportunity for the efficient delivery of hardwood pulpwood to Bell Bay. While the road access allows for heavy vehicle there is no north – south arterial connection from the plantations within the Southern Midlands, Glamorgan/ Spring Bay or Sorell LGA's to the Parattah Rail Siding. Upgrading Tunnack Road could be a catalyst for such a development with subsequent investment in upgrading strategic council roads. A highly efficient route to market would enhance the likelihood of the plantations being re-established or support the business case for further investment. It would also provide co-benefits to agricultural enterprises in the region and may provide scope to improve their transport efficiency
- DSG is currently investigating a potential business case for an upgrade of Tunnack Road at the bridge along the southern boundary of the State Highway and LGA road. At this stage the project is not currently costed
- Council is currently undertaking works on its regular renewal and maintenance program. It does not envisage any major capital road upgrades.

5.1.9 Glamorgan/Spring Bay LGA

The region is dominated by native forest supply with freight survey data in Figure 5-6 indicating there is limited freight movement in the region. Some hardwood plantation development has occurred in the southern part of the region. The plantations are now mostly mature and available for harvesting.

Figure 5-6: Potential Gaps in the B-double Network within the Glamorgon/Spring Bay LGA



Source: NPI, STT, PFT, NHVR, DSG

Table 5-10: Key Roads within the Glamorgan/ Spring Bay LGA Aggregations

ID	State Highway	State Road Hierarchy	Council Road	Road Length	Constraint - Consultation Feedback
GS1			McKays Road	46	Ownership mixed but primarily STT Forestry Road with 26 m B-double capacity
GS2			Buckland Road Nugent Road		Council roads with GA HML capacity carting hardwood pulpwood to Parattah

Source: Indufor – industry consultation

Table 5-11 shows the main forest aggregation accounts for 60% of total forest area within the LGA.

Table 5-11: Forest Distributions of Supply Catchments with Potential Gaps in the Road Network

Road Catchment	Hardwood Plantation	Softwood Plantation	Native Forest	PTR (Tall Forest)	Total
	Area (ha)				
GS1	265	0	9 931	7	10 202
GS2	3 200	34	1 594	802	5 631
Catchment Coverage	**3 465**	**34**	**11 525**	**809**	**15 833**
GS Total	**5 182**	**78**	**20 288**	**785**	**26 333**
% Total LGA	67%	44%	57%	103%	60%

Source: ABARES, STT, PFT

Following the stakeholder consultation process Indufor understands the status of each of the key roads is:

- McKays Road was used extensively while the Triabunna chip mill was active for logs travelling south. The road was constructed to a high standard and is capable of accommodating 26 m B-doubles
- Nugent Road was also a road for native forest logs travelling to Triabunna and was constructed to a high standard
- Buckland Road is part of south east Tasmania that experienced an expansion in hardwood plantation development as a result of growth in MIS investment. The plantations are largely first rotation established on agricultural land. These local council roads do not have a history of logging traffic.

In terms of opportunities for infrastructure enhancement:

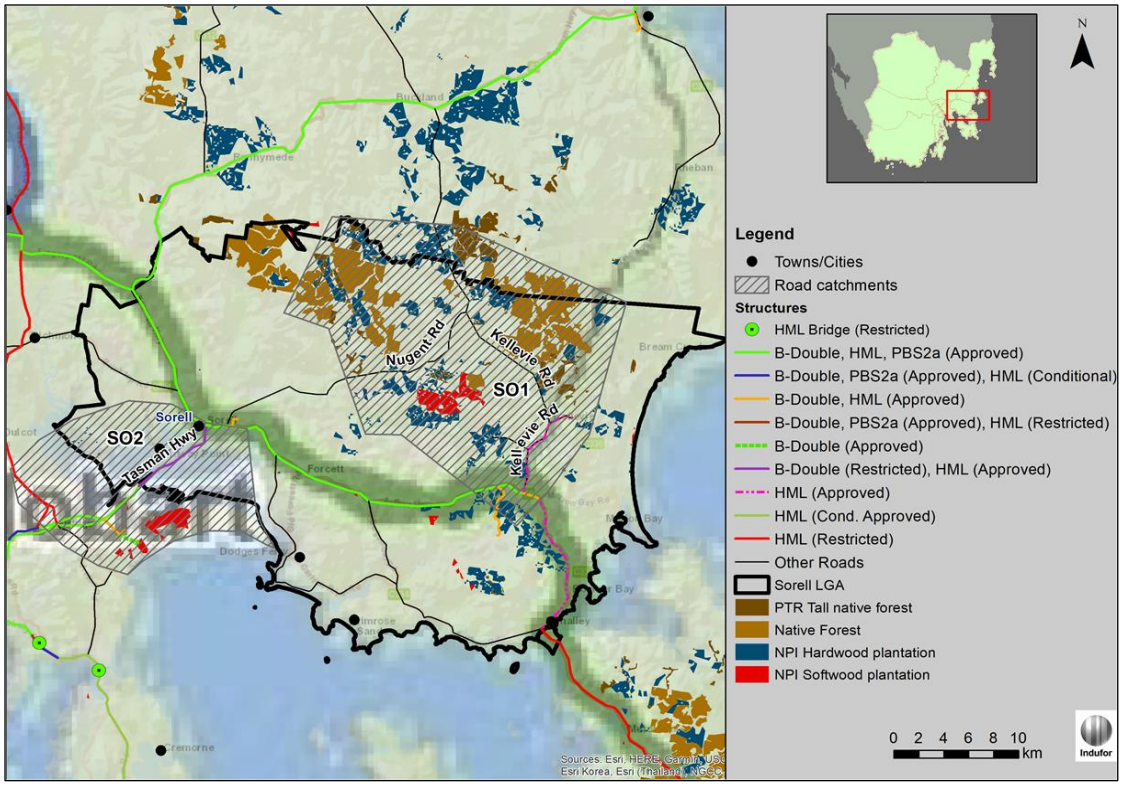
- Given their long history in supporting native forestry, McKays Road and Nugent Road most likely have limited need for improvement other than some upgrading of the road surface and drainage
- Buckland Road was not constructed as a forestry road and most likely has road design, alignment and pavement widths that are not suitable for 26 m B-doubles. Haulage permits are currently allowing GA HML – using either a mini B-double or Truck and Dog configurations. The council has no plans to upgrade Buckland Road.

5.1.10 Sorell LGA

Like the Southern Midlands LGA, the 2016/17 freight survey overlay suggests there has been limited activity within the Sorell LGA with most freight travelling along the Arthur Highway from the Tasman LGA. There are two key feeder roads to the primary 26 m B-double routes: Kellevie Road and Nugent Road. The southern end of Kellevie Road has some load restrictions.

Also of note is the Sorell Causeway which currently has a restriction on B-double movements. The causeway is currently being upgraded, but there has been no announcement on whether the upgraded route will be to a standard that allows B-doubles. Access across the causeway for log trucks would significantly reduce the distance export logs and native forest sawlogs would have to take to travel west to Hobart Port and beyond.

Figure 5-7: Potential Gaps in the B-double Network within the Sorell LGA



Source: NPI, STT, PFT, NHVR, DSG

Table 5-12: Key Roads within the Sorell LGA Aggregations

ID	State Highway	State Road Hierarchy	Council Road	Road Length	Constraint - Consultation Feedback
SO1	Kellevie Road	3	Nugent Road, Stokes Road, Kellevie Road	20 3 20	Section of Kellevie Rd HML restricted
SO2	Sorell Causeway (Tasman Hwy)	1		8	Would decrease the haulage distance to Hobart Port for most south eastern forests

Source: Indufor – industry consultation

Table 5-13 shows the forest distribution within each of the four forest aggregations that account for 95% of total forest area within the LGA.

Table 5-13: Forest Distribution in Supply Catchments with Potential Gaps in the Sorell LGA Road Network

Road Catchment	Hardwood Plantation	Softwood Plantation	Native Forest	PTR (Tall Forest)	Total
	Area (ha)				
SO1	2 345	368	2 962	855	6 529
SO2	12	275	0	0	287
Catchment Coverage	**2 357**	**642**	**2 962**	**855**	**6 816**
SO Total	**2 842**	**417**	**3 320**	**626**	**7 205**
% Total LGA	83%	154%	89%	137%	95%

Source: ABARES, STT, PFT

Following the stakeholder consultation process Indufor understands the status of each of the key roads is:

- The southern end of Kellevie Road that connects to the Arthur Highway was part of the route that historically supplied logs to Triabunna. The 2016/17 freight survey indicates some logs still travel this route to head north. Tight corners and the narrowness of the road limit vehicle size on the road limited to GA HML – either a Truck and Dog or mini B- double with a 50 tonne load
- As noted above, the northern end of Nugent Road was constructed to a standard to allow native forest logs to travel to Triabunna
- The southern end of Nugent Road is an unsealed council road. A new bridge has been constructed at the western end of the road, which is currently rated GA HML
- The Sorell Causeway is currently a two lane road. The road dimensions and the intersection where the causeway meets the Arthur Highway are not ideal for truck traffic. Consequently the existing causeway is rated GA HML.

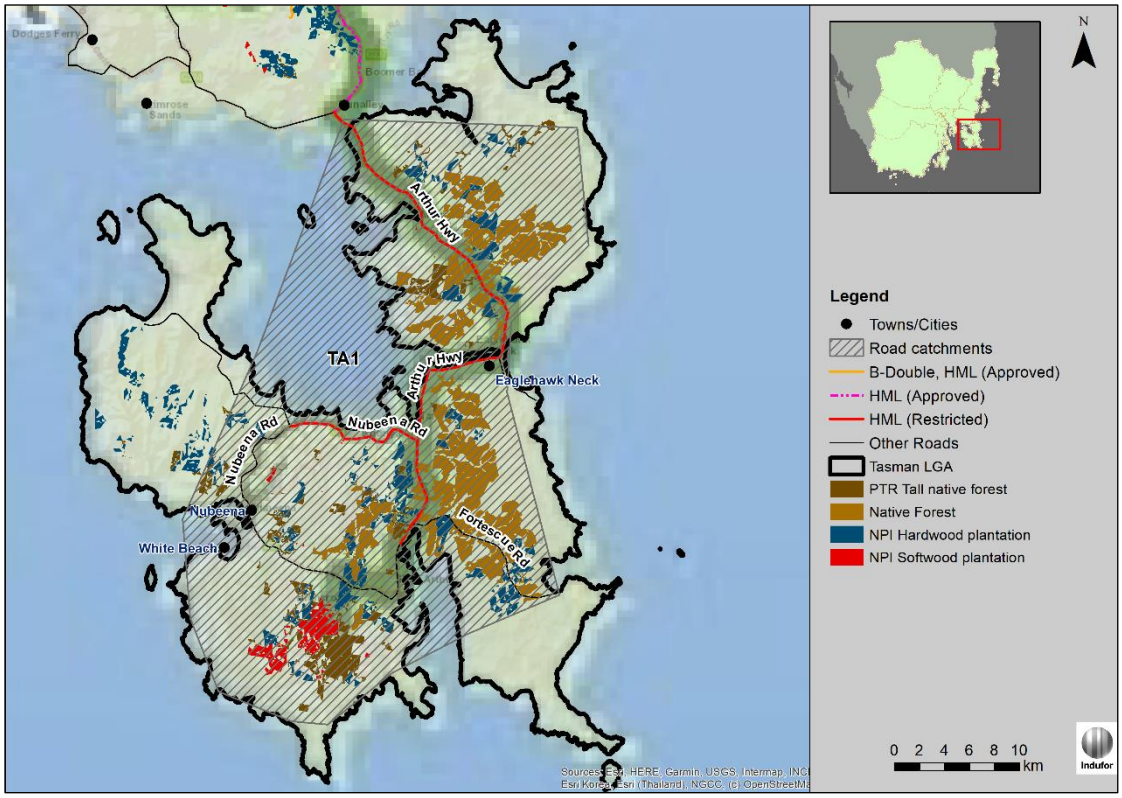
In terms of opportunities for infrastructure enhancement:

- Nugent Road and Kellevie Road represent the last link for an arterial road that could connect the south east forests to Parattah
- The Sorell Causeway is currently in the process of being upgraded by the State Government under the South East Traffic Solution program. The proposed new causeway will have four lanes. A feasibility study has been completed and detailed environmental studies and design work are currently being completed. While the existing causeway is rated GA HML, the new causeway may have the capacity to accept 26 m B-doubles. However, DSG advised that no decision has been made on whether 23 m or 26 m B-doubles will be allowed to use the upgraded road. Construction of the new causeway is expected to occur from 2023. In addition to benefits to the forest industry, an upgrade to this standard would benefit several other sectors who also use the Arthur Highway, providing more direct access to Hobart.

5.1.11 Tasman LGA

The Tasman LGA already has a significant flow of freight. However, as Figure 5-8, shows the route is restricted to GA traffic all the way to Dunalley.

Figure 5-8: Potential Gaps in the B-double Network within the Tasman LGA



Source: NPI, STT, PFT, NHVR, DSG

Table 5-14: Key Roads within the Tasman LGA Aggregation

ID	State Highway	State Road Hierarchy	Council Road	Road Length	Constraint - Consultation Feedback
TA1	Arthur Highway, Nubeena Road	3, 5	Arthur Hwy, Nubeena Road Fortescue Road	45 41 16	All log transport is HML (restricted) mainly due to the terrain out of Eaglehawk Neck. Growers advised it was difficult to get more than a standard semi, possibly mini B-double but with a 50 tonne payload

Source: Indufor – industry consultation

Table 5-15 shows the forest distribution within the Tasman forest aggregation that accounts for 94% of total forest area within the LGA.

Table 5-15: Forest Distributions of Supply Catchments with Potential Gaps in the Road Network

Road Catchment	Hardwood Plantation	Softwood Plantation	Native Forest	PTR (Tall Forest)	Total
	Area (ha)				
TA1	2 522	605	5 984	1 741	10 852
Catchment Coverage	2 522	605	5 984	1 741	10 852
TA Total	**3 086**	**605**	**5 984**	**1 814**	**11 488**
% Total LGA	82%	100%	100%	96%	94%

Source: ABARES, STT, PFT

Following the stakeholder consultation process Indufor understands the status of each of the key roads is:

- The historic Dunalley Swing Bridge is one of 4-5 bridges that cannot accept the full load of a tri-axle vehicle (up to 22.5 tonnes per axle group). The Tasman Highway is therefore limited to GA HML – either a Truck and Dog or mini B-double with a partial 50 tonne load
- The terrain out of Eaglehawk Neck is also identified as being challenging for loaded trucks.

In terms of opportunities for infrastructure enhancement:

- DSG is currently investigating these limitations as part of a suite of potential upgrades to bridges and road sections as part of the upgrade along the Arthur Highway.

These road factors were all incorporated as part of the opportunities analysis.

5.2 Potential Infrastructure Investment Projects

This section identifies a potential range of new rail and road infrastructure projects based on feedback from the consultation process and Indufor's regional analysis.

5.2.1 Rail

In addition to its priority investment in additional rolling stock (container wagons), TasRail currently has a suite of infrastructure projects that it is in the process of procuring and delivering. This includes:

- Approximately doubling the size of the Logtainer fleet with an additional 40 Logtainers
- Installation of end gates on the Log Wagons
- Installation of book ends in the terminals to allow a larger volume of logs to be stacked within the same footprint
- Expansion of the log storage area at Brighton
- Upgrading the existing passing siding at Bell Bay
- Installing in-line scales that will report that log payload on each wagon (in transit).

Detailed costs are not available but these projects would be funded from within the Tasmanian Government's $5 million Forestry Stimulus package.

TasRail is also investigating a range of longer term strategic opportunities to expand its service offering to the forest sector:

- TasRail has project funding to identify a new alignment to reconnect directly to the Bell Bay Line to the Bell Bay Port wharf. Current funding allows for the preparation of a strategic design and cost estimate. TasRail has commenced discussions with TasPorts and a review of the previous design and geotechnical information is underway. Direct access would potentially allow for log deliveries to Midway's new chip mill and log export storage on the wharf
- There is currently a non-operational rail siding into Forico's Long Reach woodchip facility. This could potentially be upgraded to allow rail access at some point in the future
- TasRail's Georgetown Freight Terminal is directly adjacent to Timberlink's Bell Bay softwood sawmill. With some modifications, there would be scope for softwood sawlogs sourced from southern Tasmania to be delivered to the Timberlink mill
- TasRail is also considering the potential to access the South Burnie Log Yard which could then provide rail services directly from the yard into Burnie Port.

The reconnection to Bell Bay is currently the most advanced of these projects but is still in the early planning stage. None of these strategic opportunities are at a point where costs can be reliably estimated.

If implemented, these projects would increase efficiencies through additional capacity:

- TasRail currently operates six days per week with 23 wagons per train. This equates to 138 wagons per week (or 5 244 tonnes) or ~257 000 tonnes/year
- If the run-around loop at Bell Bay is constructed, TasRail can increase to 30 wagons per daily train service from the south (ex-Brighton and Parattah). This equates to ~330 000 tonnes/year. This would be subject to container wagon availability as TasRail would need to substitute 12 containers wagons to do achieve this scale of service.

Further increases could be gained by shifting to a seven day a week operation. However, this would be a major undertaking and would require changes to customers opening hours which are also currently operating six days per week. Assuming the Bell Bay loop is in place the annual volume that could be supplied by 30 wagon trains would be ~380 000 tonnes/year.

5.2.2 Multi Criteria Analysis of Potential Road Infrastructure Improvement Projects

To assess the areas of opportunity for further investment in road infrastructure, Indufor applied a multi-criteria analysis (MCA) approach. This provides a flexible methodology that allows for a meaningful comparison of quantitative and qualitative information. One of the main benefits of the MCA is it provides a standardised methodology that is transparent and simple to follow.

The analysis incorporates:

- The identification of the key road transport routes relative to the distribution of forests across southern Tasmania
- The current status of the key routes identified as discussed with a range of stakeholders as part of the consultation process. Comments on road conditions tended to be general in nature. A detailed technical engineering evaluation of each route is beyond the scope of this study
- While the consultation process also aimed to identify opportunities for improvement to the road network, and their associated costs many of the parties contacted were not actively considering these options. Consequently, this led to a lack of reliable information on the potential costs associated with the road upgrades.

The criteria and indicators used for the analysis are summarised in Table 5-16. The MCA is based on three main criteria; economic benefit, benefit to industry and feasibility. While environmental values are essential consideration, it would be difficult to quantify the effects with a high level analysis such as this. Any environmental impacts associated with upgrading road infrastructure would be rigorously assessed as part of the detailed planning process.

Similarly cultural impacts are also important but are beyond the scope of this assessment. Other social considerations such as the degree of disruption on adjacent landowners are considered as part of the feasibility assessment.

Table 5-16: Criteria and Indicators used to Assess Road Infrastructure Investment Opportunities

Criteria	Indicator used for scoring
Economic benefit	• Scale • Level of improvement to economic returns • Benefit to single or shared among multiple parties • Broader benefits beyond the forest sector
Benefit to industry	• Enhances investment opportunities within the sector • Impact on investment decision to replant • Degree it affects other parts of the supply chain
Feasibility	• Cost • Source of funding • Timeframe for implementation • Complexity • Degree of disruption

Source: Indufor

The assessment for each criterion incorporates a 'score', in indicative terms, based on a scale from 1 - 5, reflecting whether an indicator is highly aligned (5) or highly incompatible or absent (1). A score of (3) indicates a neutral assessment.

In terms of the economic benefits the indicator assessments are based on:

- Scale – is based on Indufor's forecast wood flow by LGA as determined in Section 4.4.2 for the Hobart Port analysis. The wood flows were applied on a pro rata basis depending on the distribution of forest types within each road catchment aggregation
- Level of improvement to economic returns – considers two factors: the cost savings that could be made from having all transportation undertaken using HML 26 m B-doubles and the transport cost savings that could be made where a shorter haulage route could be realised (recognising this ignores some existing regulatory constraints). The analysis assumes three vehicle combinations:
    - A base configuration of a GA Truck and Dog configuration with a 50.5 tonne gross weight and a payload of 33.5 tonnes
    - A GA mini B-double configuration with HML with a 57 tonne gross weight and 38 tonne payload. Assumed to be 3% more efficient than a Truck and Dog configuration
    - A 26 m B-double with HML having a gross weight of 68.5 tonnes and a payload of 44.5 tonnes. Assumed to be 17% more efficient than a Truck and Dog configuration
    - The cost efficiency assumptions are based on a combination of Indufor's internal truck costing models which were benchmarked against known costs for these configurations. This was then cross referenced with Tasmanian transport contractors as part of the consultation process
    - Transport distances to Hobart Port, Bell Bay, the Brighton Rail Hub or Norske Skog were estimated using one or two centroid points within each forest aggregation. For native forest sawlog supply, the average haulage distance was estimated. These were applied to derive a volume weighted average haulage cost for each truck configuration
    - The economic benefit of larger, more efficient trucks was calculated using the annual cost differential between the 26 m B-double and the truck configuration

most commonly used on that route, typically a mini B-double. The net present value of the annual cost savings was calculated using an 8% discount rate

- Where a shorter haulage route was considered an option, the annual economic benefit was calculated as the haulage cost differential for the volume of logs that would benefit from the shorter route. The net present value of the annual cost savings was calculated using an 8% discount rate

- Key beneficiaries – Indufor maintains spatial data several resource owners. The road catchment areas were overlaid the distribution of grower area to identify the beneficiaries of any road upgrade. A higher score was applied where there were three or more beneficiaries
- Broader benefits to other sectors – was applied subjectively based on benefits to other sectors such as tourism, fishing or agriculture or general freight movement around Tasmania.

For the assessment of benefits to industry, the following indicator assessment was applied:

- The primary assessment considered the degree to which a road upgrade would support future plantation expansion. For example upgrading a road to improve access to state forest would get a low score as there is limited scope for further expansion of the estate compared to an upgrade within a rural landscape where additional land may be available for plantation expansion.

For the feasibility assessment, the following indicator assessments were applied:

- Cost - The lack of reliable comparable upgrade cost data meant a subjective assessment was required based on the relativity in potential cost between projects. The potential level of cost was considered based on the key constraints identified through the literature review and the consultation process as well as physical parameters such as the number of bridges that would need to be upgraded (where identified) or the length of road to be upgraded
- Source of funding – identifies whether the upgrade investment is led by DSG or local councils
- Degree of disruption – considers the other land uses occurring along the proposed upgrade route as well as other potential users of the road
- Ease of execution - in a similar vein, the ease of execution is a subjective assessment based on a combination of three factors noted above.

Based on the analysis of each forest aggregation in Section 5.1.4 it made more sense to consider some of the options as a consolidated unit which would be part of a larger investment project. Other areas were excluded from the assessment process as they are largely already at a standard suitable for 26 m B-double trucks. The rationale for these changes and the units used for the MCA assessment are summarised in Table 5-17.

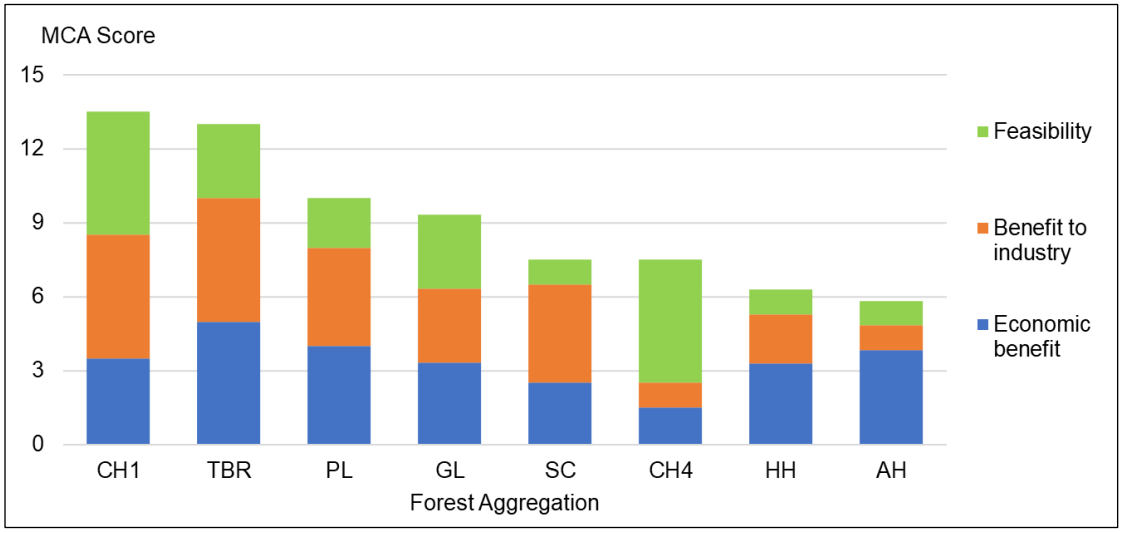
Table 5-17: Forest Units Considered for the Multi Criteria Analysis

MCA Assessment Identification	Forest Aggregation	Rationale
TBR – Tunnack/ Buckland/ Woodsdale	GS 2, SM1 and SO1	These areas have a high proportion of first rotation hardwood pulpwood plantations. Logs would predominantly travel north to Parattah. A defined arterial access route would collectively benefit all these forest groups
GL	HV1	A stand-alone option with potential to realise cost efficiencies via a shorter haulage route
CH1	CH1, CH2 and CH3	A consolidated production area that collectively produces a significant volume of pulpwood that travels north east to Bell Bay
AH	TA1	The Arthur Highway is the key exit route for logs sourced from the Tasman Peninsula
PL	DV1	One of the heaviest used roads by the forest sector which is strategically important to Norske Skog
SC	SO2	Sorell Causeway – given the upcoming upgrade the benefits to industry should be considered on a stand-alone basis
HH	HV2	Upgrading of the Huon Highway considered on a stand-alone basis
CH4	CH4	Sufficiently isolated from other CH blocks to be considered separately
Excluded	DV2	Styx Road already uses 26 m B-double trucks so no further evaluation is required
Excluded	GS1	McKays Road already uses 26 m B-double trucks so no further evaluation is required

Source: Indufor

The results of Indufor's scoring using a multi criteria analysis approach is shown by overall ranking in Figure 5-9.

Figure 5-9: Ranking of Priorities for Investment in Road Infrastructure Improvement



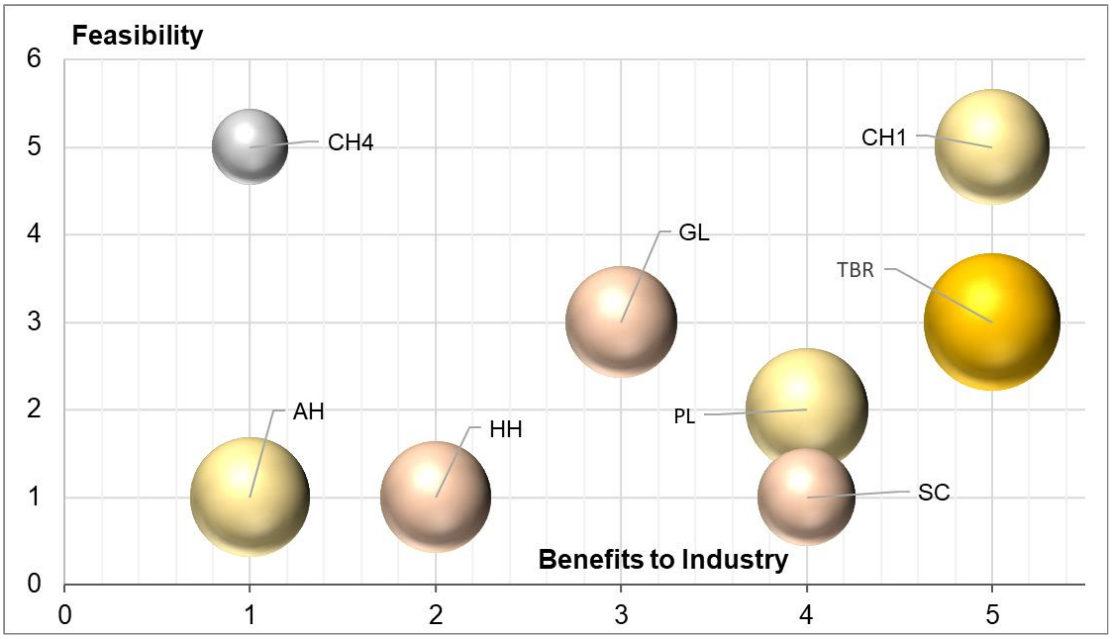
Source: Indufor

The results of the MCA show a distinct ranking in terms of priorities:

- CH1 (Central Highlands) represents one of the largest production zones in southern Tasmania with a substantial proportion of the total harvest volume travelling by truck to Bell Bay. The road infrastructure upgrade benefit is focused on improving the standard of Fourteen Mile Road and upgrading the Lyell Highway between Fourteen Mile Road and the Marlborough Highway. Benefits to upgrading the Lyell Highway would accrue beyond the forest industry as the road provides a strategic link to north west Tasmania
- TBR (south east region) scores highly due to the strategic value of having a direct arterial connection between the concentration of forests to the south and Parattah where it can link with the rail siding or the Midland Highway. Realisation of this outcome would depend on a co-ordinated approach across multiple jurisdictions with DSG, Southern Midlands, Glamorgan/ Spring Bay and Sorell councils all involved in the process. This has a high benefit to industry as these upgraded roads would be in agricultural areas which could potentially be involved in any plantation expansion program
- PL (Plenty Valley Road) is a strategically important road and is one of the key haulage routes for the softwood plantation sector in southern Tasmania. Two key limitations affect the scoring: the relatively short haulage distance from the forests to the Norske mill mean the full benefits from a transition to 26 m B-doubles may not be fully realised and the technical challenges associated with upgrading the road, crossing the Derwent River and local community impacts also impact negatively on the scoring
- GL (Glen Huon/ Lonnavale Road) is another strategically important route where real savings can be realised if log trucks are permitted to use Glen Huon Road. However, given the longstanding ban on the use of the road this is likely to be met with strong community resistance
- SC (Sorell Causeway) scores strongly on benefits to industry as it allows growers in the south east more direct access to Hobart Port. This access is important as the analysis in Section 4.4.6 identified that the greater the proportion of harvest volume that is processed within the region or exported via Hobart Port, the higher the return on investment. Upgrading the causeway and permitting 26 m B-doubles on the road provides a double benefit to growers as well as other industries that would use this route
- CH4 (Dennistoun Road – Central Highlands) is a relatively small project and scores highly as it is relatively straight forward to undertake relative to the requirements of some of the other projects
- HH and AH (Huon Highway and Arthur Highway) are both lower order roads in the State Road Hierarchy. Any upgrade to these roads will be determined by a range of factors, of which the value of the improvements to the forest sector would be one consideration. In the case of the Huon Valley Highway, the presence of parallel Forestry Roads capable of transporting 26 m B-double trucks would influence the decision on the need to upgrade the highway. The Arthur Highway is going through a series of improvements which will benefit the industry, but there is no project yet announced that addresses the limitations currently identified.

The guide in Table 5-16 was then used to rank each options according to the three overarching criteria: economic benefit, benefit to industry and feasibility. Below is the summary output of this analysis, where the economic benefit relates to the size of the bubble.

Figure 5-10: Ranking of Road Infrastructure Investment Options



Note: Scaling completed from 1 (lowest benefit) through to 5 (highest benefit) for the three criteria

Legend to the chart

TBR – Southern Midlands/Glamorgan - Tunnack Road/Buckland Road aggregation – B-double access

CH1 – Central Highlands – Lyell Highway/Victoria Valley Road/Strickland Road/Waddamana Road aggregation – B-double access

CH4 – Central Highlands - Dennistoun Road – B-double access

GL – Huon - Glen Huon Road/Lonnavale Road – B-double access, reduced haul distance

HH – Huon – Huon Highway upgrade for B-double access

PL – Derwent Valley - Plenty Valley Road – B-double access

SC – Sorell – Sorell Causeway – B-double access, reduced haul distance

AH – Tasman – Arthur Highway – B-double access

Securing these infrastructure enhancements will require careful and coordinated planning with a range of management authorities, including local government, infrastructure managers and developers, and with state government departments, to provide benefits that support the viability of regional employers involved in the timber supply chain, as well as co-benefits to the Tasmanian communities. These results are based on a high level assessment. It is recommended that these projects be considered in more detail to more accurately define the project scope, costs and benefits.

6. SUMMARY OF KEY FINDINGS

The following outlines the key findings of the study. Importantly the study notes the range of relatively recent infrastructure investments made around southern and central Tasmania that have benefited the forest industry and wider Tasmanian society. The combination of those more recent infrastructure investments have been completed in alignment with long term investments, such as the Boyer complex and Hobart Port.

The recent investments in rail, both below track and in the locomotives and rolling stock of TasRail, have resulted in a range of opportunities for the forest industry to secure efficient forms of market access. The development of rail head facilities at Brighton and Parattah, along with specialised rolling stock, has seen rail further become a viable part of the forest industry's supply chain.

Similarly, a suite of road infrastructure enhancements across the region has enabled the industry to continue the movement towards high mass vehicles including increasing the proportion of B-double configured trucking.

Finally, the trade through Hobart Port has increased markedly since the middle of last decade, reflecting the potential of the port to supply market access for products which the domestic industry has low levels of demand.

The following key findings recognise the industry needs to evolve in alignment with the operating environment, and secure opportunities that underpin a long term viable industry. These opportunities include viable utilisation of the existing plantation crop which will catalyse reinvestment in plantations for future crops.

6.1 Hobart Port

The importance of an efficient Hobart Port was consistently identified by growers and processors during the consultation process as being one of the most important pieces of infrastructure in southern Tasmania.

The export volume has increased markedly since the middle of last decade. Growers and processors note the trade through the port is relatively small compared to other major export ports around Australia and that the port is not operating at capacity. This contributes to the port being a high cost operation relative to other ports around Australia.

Preferably, growers and processors would be able to enter into access arrangements that commit to a medium to longer term of throughput. This would result in development of dedicated port footprints based on products or management arrangements, along with related port infrastructure equipment.

Securing the access to Hobart Port has important economic and employment outcomes, as well as increasing the potential for replanting future crops as the returns will be higher than transporting forest material to the northern ports of the state.

Current access to the port is via the southern entry of Evans Street. The industry observes the ongoing development of the Hobart waterfront precinct and broader Hobart Port objectives relating to tourism, heritage and Antarctic programs. Given this situation, the industry recognises a key benefit to the southern portions of the port and to Hobart's waterfront precinct would be to develop an efficient northern road access.

If undertaken as part of an integrated approach with other parties such as the MPDC that have an active interest in developing a northern access route then this development would facilitate a range of benefits to all parties, including reducing congestion that might arise in the southern entry to the port, but also provide a clear focus to the port precincts so that Macquarie Wharf is recognised as a dedicated commercial trade port.

This focus recognises that Hobart Port is a natural deep water port, providing high quality port access given the lack of any dredging requirements and ready piloting of large vessels.

The development of the port's northern access route will also benefit supplies of forest products and other related bulk commodities arising from the Southern Midlands, Central Highlands, east coast and the Derwent and Huon Valleys.

Part of this development recognises the need to address pre-existing infrastructure requirements on Macquarie Wharf so as to ensure it maintains its structural integrity for long term use.

The development of the northern access route will require good coordination with the respective responsible parties dealing with the broader port area.

6.2 Short Term Infrastructure Opportunities (1 - 5 years)

A range of short term infrastructure development opportunities have been identified in this study:

- Hobart Port
    - Development of planning and design of northern access route to Macquarie Wharf
    - Re-instatement of structural integrity of Macquarie Wharf
    - Government commitment to long term commercial use of Macquarie Wharf
- Rail
    - Preparation of a business case for the purchase of additional container wagons to increase rail capacity and delivery options for industry
    - Development of hard infrastructure required for a log processing hub as part of the Brighton railhead arrangements
    - Confirmation and implementation of management arrangements for log processing facilities
- Road
    - Further investigation into changes to improve the truck permitting system
    - Preparation of the business cases and implementation plans for the priority road infrastructure investments identified in Section 5.

6.3 Medium Term Infrastructure Opportunities (5 – 15 years)

The medium term planning for the sector takes into account the increasing reliance on plantation logs as a major source of supply, with natural forest harvest levels declining overall. This phase of infrastructure opportunities will also recognise the on-going demographic changes that might be occurring around the greater Hobart city, and the potential requirements to re-examine road development priorities. Similarly, a key to future development of the industry is to explore the potential for use of brownfield sites that might come available. Utilising brownfield sites recognises the existing use and planning approvals that are in place, and the potential for supplementing with a complimentary use.

The following is a summary of opportunities currently under consideration:

- Hobart Port
    - Complete arrangements for the northern access road arrangements and commission the new access route
    - Maintain forest products trade through the port and explore further complimentary product trade
- Wood processing hubs
    - Explore potential for establishing new wood processing facilities within footprints of existing wood processing, recognising the benefit of processing occurring within the general Brighton/Derwent Valley given proximity to a range of forest resources and existing infrastructure

- Road
    - Ongoing investment in the preparation of the business cases and implementation plans for the priority road infrastructure investments identified in Section 5
- Rail
    - Review of needs for further enhancements in rail infrastructure, including exploration of further siding developments and below track investments to provide further resilience to the rail freight industry.

6.4 Long Term Infrastructure Opportunities (15 – 30 years)

The long term infrastructure opportunities will be driven by expected resource availability estimates, and the extent existing harvesting operations result in the replanting of future crops and the potential expansion of new greenfield plantations. Similarly, a wide range of contextual aspects will influence the infrastructure requirements of the sector, with carbon pricing a key determinant that would influence new plantation investment decision making.

Within the various climate change predictions, impacts on Tasmania generally are less severe that what might be observed on the mainland. However, developing increased resilience in the infrastructure of the region is likely to be a policy imperative, reducing the risk of major disturbance to the use that might arise from differing fire or flood scenarios.

Given these settings, current opportunities identified for the sector include:

- Road
    - Ongoing investment in the priority road infrastructure investments identified in Section 5, along with other likely needs in respect to bridge replacements or strengthening and responding to demographic preferences that result in the need to upgrade existing low use forest roads
- Rail
    - Review of needs for further enhancements in rail infrastructure that enhance resilience, including exploration of below track investments particularly bridges and floodways to reduce the risk of disruptions to the rail network due to an expected increase in extreme climatic events.

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