MUR 2024-024

Infrastructure Needs and Optimisation Assessment

Prepared for the Murray Region Forestry Hub

May 2025

GREENWOOD STRATEGY

ESK SPATIAL

Murray Region Forestry Hub

CONTENTS

Contents **2**

List of figures 3

List of tables 4

Disclaimer **5**

Executive summary **6**

Introduction **7**

About the Hub 7

About this project 7

Project aims 8

Current state review **9**

Project context 9

The forest and wood products industry 9

Logistics and transport infrastructure 9

Previous studies 10

Overview 10

Forestry specific infrastructure studies 10

Regional studies and government policy 11

Transport efficiencies 13

Stakeholder consultation 13

Infrastructure efficiencies **14**

Overview 14

Current haulage task 14

Log transport 14

Manufactured product transport 17

Haulage impacts 17

Haulage mapping 18

Road infrastructure description 18

Overview 18

Identification of infrastructure issues 21

Assessment of infrastructure priorities 21

Specific road infrastructure priority issues 27

Future state analysis and comparison **32**
Overview 32
Development of scenarios 32
Identification of potential efficiencies 32
Current configurations 32
Potential configurations 32
Scenarios 33
Analysis and results 33
Total truck movements 33
Total fuel use and emissions 34
Comparison for log transport 34
Discussion 34
Improved safety outcomes 35
Challenges to improved transport efficiency 35
Discussion **36**
Overview 36
Road infrastructure 36
General 36
Tumbarumba 36
Logistics capability 37
Reducing interactions between road users 37
Improved haulage efficiency 37
Opportunities for further work 38
Infrastructure upgrade projects 38
Logistics efficiency projects 39
Information availability 39
References **40**

List of figures

Figure 1: Murray Region Forestry Hub location and boundaries 7
Figure 2: Summary of the annual regional freight task (tonnes) 15
Figure 3: Average annual freight task elements by product 15
Figure 4:Regional haulage task – all freight (2025-2034) 19

Figure 5: Regional haulage task - all logs (2025-2034) 19
Figure 6:Regional haulage task – all inputs (2025-2034) 20
Figure 7: Regional haulage task - all outputs (2025-2034) 20
Figure 8: Proposed alternative route for log haulage from the Warrenbayne plantations complex 27
Figure 9: Proposed alternative route along Courabyra Rd, bypassing Tumbarumba township 28
Figure 10: Proposed Jingellic Rd upgrade and repair works 29
Figure 11: Pavement damage and deformation on Jingellic Rd (SWG business case) 30
Figure 12: Narrow bridge at Mannus Creek on the Tumbarumba-Wagga Road 31
Figure 13: Comparison of annual average log truck movements and fuel use for various scenarios 38

List of tables

Table 1: Summary of annual freight task by freight category (Baseline 2025-2034) 16
Table 2: Baseline haulage task impacts by freight category 17
Table 3: Truck configuration assumptions for baseline analysis 18
Table 4: Estimated road infrastructure upgrade costs for the Hub 22
Table 5: Summary of estimated capex requirements by priority 23
Table 6: Infrastructure priority assessment results for identified issues 24
Table 7: Transport efficiency scenarios 33
Table 8: Changes in truck movements between scenarios 33
Table 9: Changes in fuel use between scenarios 34
Table 10: Comparison of key metrics for scenario changes for log transport 34
Table 11: Summary of estimated road improvement expenditure by local government area 36

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ABN 56 635 341 721

Acknowledgements

This report was commissioned by the Murray Region Forestry Hub with funding from the Australian Government, Department of Agriculture, Fisheries and Forestry.

EXECUTIVE SUMMARY

The nationally significant forest and wood products industry in the Murray Region Forestry Hub comprises 170,000 ha of softwood plantation and major processing facilities in Benalla, Wangaratta, Wodonga, Myrtleford, Tumut and Tumbarumba. The region's timber products manufacturers process about 4 million tonnes of inputs from within the region and as far afield as south-west South Australia and northern NSW. Each year these inputs produce about 1.8 million tonnes of paper, cardboard, panels, sawn timber, veneer and roundwood which is transported, via the Hume Highway, to markets across Australia. This represents a significant annual freight task, involving 159,000 loaded truck movements using about 6.8 million litres of fuel and generating 23 million tCO_2e.

The nature of the freight task, and the socio-economic environment in which it operates, has and will continue to evolve. Interaction with other road users, including tourism, industrial and agricultural traffic, is expected to increase and there will be continued advances in haulage technology and infrastructure capacity to deliver more efficient freight transport solutions.

This project assessed the current road infrastructure and freight haulage situation and described and quantified the preferred future state. It has identified $118.825 million of priority road improvement projects which can deliver better road safety and increased freight transport efficiency. The project has also assessed the positive impacts that can be delivered by improving logistics efficiencies, particularly through changes in log haulage fleet configuration that enable increased use of A-double trailers.

A suite of opportunities for further work have been identified and described. If supported and undertaken, these projects will provide the framework to ensure the region's road infrastructure capacity and logistics capability adapt to meet the requirements of its evolving industry.

INTRODUCTION

About the Hub

The Murray Region Forestry Hub is one of 11 similar organisations established under the National Forest Industries Plan (Australian Government, 2018). The Hub was established in southern New South Wales in 2020 and later expanded to incorporate north-east Victoria.

The Hub covers the region east of the Hume Highway, west of the Great Dividing Range, south of Gundagai, and through north-east Victoria to Lake Eildon. There are several locations with important timber processing facilities, including Tumut and Tumbarumba in New South Wales and Barnawartha, Benalla, Myrtleford and Wangaratta in Victoria (refer to Figure 1). The Hub region represents a nationally significant concentration of softwood plantations and wood processing.

The primary purpose of the Hub and the projects it oversees is to provide advice to the Australian Government that can inform positive policy outcomes and encourage industry growth in the Region.

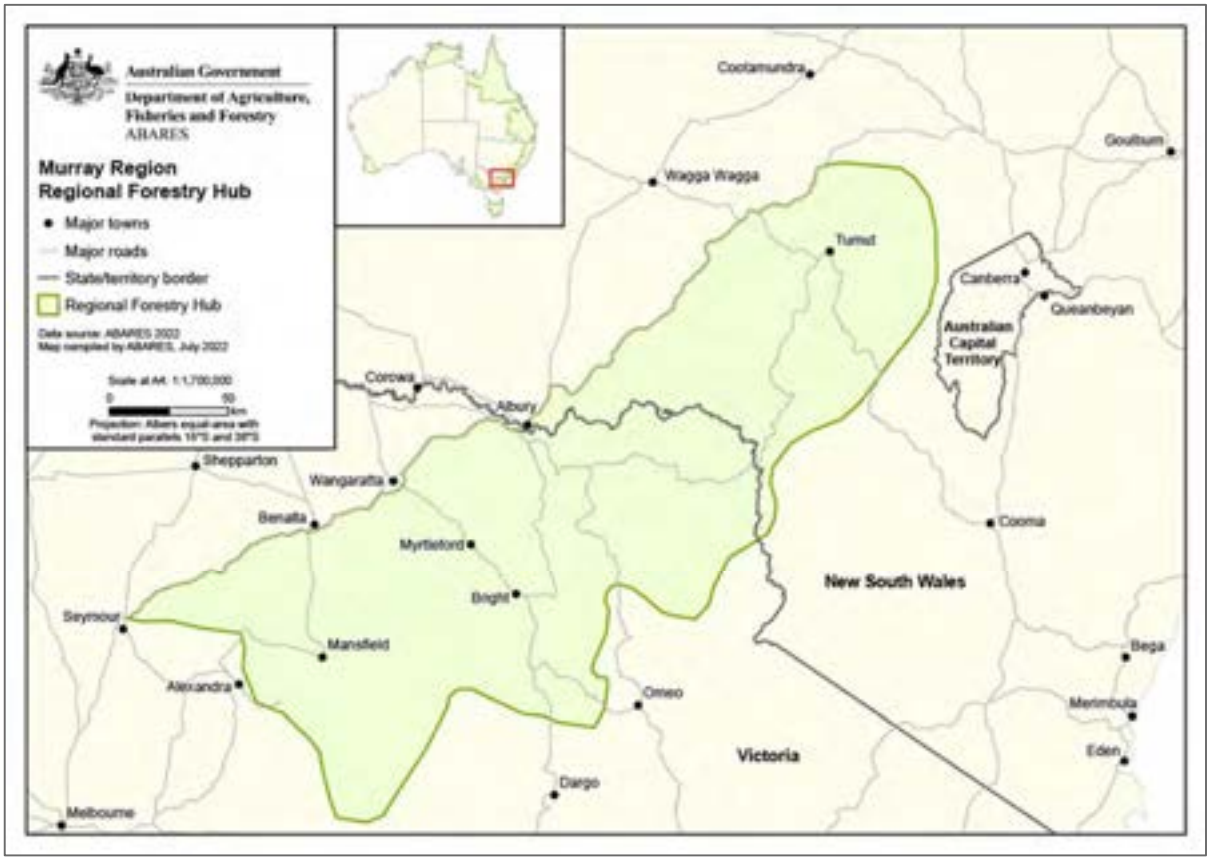

Figure 1: Murray Region Forestry Hub location and boundaries

About this project

This project aims to develop a comprehensive understanding of the freight task related to processing input materials and finished (manufactured) goods movements for the Hub's forest management and wood processing sectors and to identify efficiencies for future transport needs based on both existing and potential

future road infrastructure configurations. A particular focus for the project is the role of high productivity vehicles (HPVs) and performance-based standards (PBS) approved haulage solutions in delivering improved haulage efficiency, road maintenance and road safety outcomes for the region.

Project aims

The changing nature of the freight task for the region's forest and wood products sector has prompted this expansion of previous road infrastructure work to also consider the role of transport efficiencies which can potentially be delivered by HPVs and PBS approved solutions.

These transport efficiencies have the potential to achieve positive economic, industry and community benefits, such as:

- Enabling more efficient operation of the regional timber growing and processing industry.
- Ensuring access to the plantation resource of the future.
- Minimising the risk of supply interruptions for the processing sector.
- Improving road safety for local communities.
- Reducing on-going maintenance costs for assets owners (State and Local Government and forest owners).
- Reducing emissions through more efficient haulage configurations.

The project aims are to:

1) Review previous work relevant to assessing the regional freight task and infrastructure condition.
2) Undertake extensive stakeholder consultation to better understand the regional freight task and existing infrastructure challenges and solutions.
3) Determine infrastructure and freight task efficiencies for future transport needs based on the existing road condition and network.
4) Identify the desired future state with respect to infrastructure and freight task.
5) Model emissions between current and future desired state to determine potential improvements.

CURRENT STATE REVIEW

Project context

The forest and wood products industry

Sector description

The forest and wood products sector in the Hub region is based around a 170,000 ha softwood plantation (*Pinus radiata*) estate which currently produces about 2.5 million m^3/yr of log products. The plantation estate services a nationally significant concentration of processing capacity which manufactures solid wood (sawmills, veneer and engineered wood) and fibre-based products (medium density fibreboard, cardboard, particleboard and flooring). Processing facilities are located at Benalla, Wangaratta, Myrtleford, Barnawartha, Tumbarumba and Tumut. In addition to logs grown within the region, a further 670,000 m^3 are imported annually from other plantation growing areas, including northern, central and south-east New South Wales, Gippsland, Central Victoria and the Green Triangle region of south-west Victoria and south-east South Australia.

Industry contribution

The forest and wood products sector in the region contributes very significantly at the local, state and national levels. Numerous studies have assessed the industry contribution in Victoria and New South Wales separately. In 2023, the Hub commissioned a post-fire consolidated socio-economic assessment for the entire region (Mylek *et al.*, 2023). The report showed that in 2021/22 the sector generated $3.8 billion in gross regional output for the region, including $2 billion from flow-on effects. Industry net expenditure was $1.45 billion. The industry employed 2,189 people, of which 54% were in primary wood and paper processing. When flow-on impacts are included, a total of 11,429 FTE roles are supported by the industry's activity locally and nationally[1].

These socio-economic metrics are important because every dollar of economic contribution and every job relies on the industry's ability to safely, efficiently and effectively transport raw logs and manufactured wood products into, within, and out of the region.

Logistics and transport infrastructure

The Hub region is well serviced by an established and well-understood road infrastructure asset base which operates from the forest, through the local and state government road networks to the national road network. The Hume Highway forms the backbone of the region's transport network, connecting it efficiently to the entire east coast, and providing it with good access to both resources and markets well beyond the physical footprint of the region.

However, there are challenges. In particular:

- The region is relatively densely populated and is an important tourism destination. There is routine interaction between log and wood products freight and other major road users.
- While there has been considerable and successful focus over a long period to develop road infrastructure quality and suitability, there remain specific industry transport challenges, particularly in and around Tumbarumba.

[1] Data for the report were collected during a post-fire period of elevated economic activity.

- There are material efficiencies to be realised if the industry can capitalise on the state and national policy shift towards increased use of high productivity vehicles (HPVs) and performance-based standards (PBS) for heavy vehicle truck transport. However, there continues to be some institutional, industry and community resistance to the use of longer and larger haulage configurations such as A-doubles.

Previous studies

Overview

Since the early 1990s the Softwoods Working Group (SWG) has conducted regular reviews of road infrastructure in the south-west slopes of NSW. These reviews have focused on road maintenance and upgrade requirements, especially large capital projects, that result in improved transport outcomes for all road users, including the forest and wood products sector. The work of the SWG has resulted in some very important regional outcomes, including the upgrade of Gocup Road. However, the SWG's previous work has not specifically addressed potential road haulage efficiencies associated with alternative truck and trailer configurations.

In Victoria, the Timber Industry Road Evaluation Study (TIRES) has been undertaken every five years or so since the late 1990s, overseen by the Municipal Association of Victoria, and with a focus on road maintenance and upgrade requirements. However, the North-East Victorian local government authorities have not participated for approximately ten years. The TIRES process has also not considered potential road haulage efficiencies associated with alternative truck and trailer configurations.

There has not been any historic work undertaken to examine the road infrastructure and haulage requirements across the whole region (NSW and Victoria). As the haulage task for the region's industry continues to evolve, there is a need for work that considers the current and future road haulage task and its implications for the future management of infrastructure across the consolidated region. Of particular interest is the need to address residual infrastructure bottlenecks as well as those that are likely to emerge as the industry strives to implement more efficient and higher productivity logistics solutions.

Forestry specific infrastructure studies

There are three relatively contemporary forestry specific studies of relevance.

Business Case Supporting the Need for Investment in Priority Roads (South-West Slopes Haulage Study)

This report, completed by the SWG in 2015, is the sixth such report prepared for the industry in the south-west slopes region of NSW since 1990. It provides the background and rationale for estimating the capital funding required to upgrade essential components of road infrastructure in the region. In doing so, it aims to enable efficient operation of the regional forest and wood products sector, ensure future plantation access, minimise risk of supply disruptions, deliver safe roads and reduce ongoing maintenance costs. It represents work undertaken by the industry in collaboration with three key LGAs (Snowy Valleys, Cootamundra-Gundagai and Greater Hume) and is used for communicating with local, state and federal government organisations to support funding requests and priority setting. Four priority case studies (Bombowlee Creek Rd, Broadleaf Park Rd, Coppabella Rd and Northern Rd complex) were assessed and a total capex requirement of $14.465 million identified. The report includes detailed economic analysis and metrics.

Timber Industry Road Evaluation Study (2016-2020)

Timber Towns Victoria commissions the TIRES report every five years. The first report was prepared in 1999 and the most recent was completed in 2022. The evaluation is a collaborative effort between local government and the industry. It collates harvested wood movements across local government managed local roads, assesses priority works and estimates capital expenditure necessary to deliver upgrades and maintenance.

Historically there were four identified regions (Gippsland, South West, Central and North East), with LGAs in each of those regions being members of Timber Towns Victoria. The North East Region shires (Alpine, Indigo, Murrindindi, Towong and Wangaratta) are no longer members of Timber Towns Victoria and so were not addressed in the 2022 review. In the 2016 review, a total of $10.13 million of capex was identified in the North East region. It identified the significant road needs for the industry in the region, driven by year-round harvesting and supply to major processors based in the region. It also identified steep terrain and high rainfall as drivers for provision of high quality road infrastructure in the region.

Jingellic Road Upgrade Business Case

Jingellic Road is an important transport link connecting Holbrook and Jingellic and providing interstate access across the Murray River. It is used by a range of industries (including timber) and is also an important tourism route. Following the Black Summer bushfires, it was an important log haulage route and consequently experienced unplanned log freight traffic. A detailed business case for upgrading Jingellic Road was prepared in 2023. It is focused on repairing current damage and upgrading the road to address the requirements of current and future traffic. The business case provides useful regional context as well as contemporary costs for regional road works.

Regional studies and government policy

Regional studies and policy that are relevant to this project are typically generic to all rural industries within the Hub region and often address road as part of the broader freight movement framework, which includes rail and ports. Relevant work prepared over the past decade provides some important shared themes:

1. The importance of improved regional road infrastructure to support the efficient movement of commodities from farmgate to the relevant last mile (either domestic manufacturing or export), and manufactured goods from regional centres to either domestic or export markets.
2. The importance of improving road infrastructure and accessibility for High Productivity Vehicles (HPVs). This is to support an efficient road freight task, reduction of truck movements and reduction in vehicle emissions.
3. Links between road, rail and sea freight, and the important role of intermodal facilities (such as the Wodonga Logic Centre and the Wagga RiFL Hub).
4. The role of state-level infrastructure in supporting interstate trade.

There is a material difference in both the amount and currency of Victorian information when compared to New South Wales information which is relevant to the region. The most recent available regionally specific literature for the North East region of Victoria is more than a decade old (2012-2013).

New South Wales

Two regionally specific reports are available:

1. Riverina and Murray Joint Organisation (RAMJO) Regional Freight Transport Plan (2023).
2. Riverina Eastern Regional Organisation of Councils (REROC) Regional Freight Management Plan (2019)

In relation to this project, the RAMJO plan does not identify forest and wood products transport as a key issue and mostly addresses issues further west than the major plantation areas, although it does include Albury and therefore the important Hume Hwy nexus with Wodonga and Victoria. The REROC plan specifically recognises the forest and wood products sector, although does not separate inputs (log) and manufactured (processed) commodities. Both reports identify specific route constraints and priorities and reference the policy and planning framework for the assessments. Each of the plans has four goals and 12 strategies which are the same for both regions.

Transport for NSW has published a Freight policy reform consultation paper (April 2024) which considers strategic issues associated with the transitioning freight task. It describes the current freight task in terms of exports/imports, interstate and intrastate freight movements and the regulatory environment. It looks at future change driven by factors including population growth, climate change, technology and reducing emissions. It is high level and strategic but provides very useful context for this project.

In September 2024, the Transport for NSW issued an updated *NSW Heavy Vehicle Access Policy* (the original was published in 2018). It is heavily focused towards supporting new and innovative ways to optimise access to the State's road network for high productivity vehicles and to improve network capability. It incorporates five strategic pillars and 28 action statements which, in addition to infrastructure capability, focus on the role of technology and vehicle innovation to assist in driving change.

Victoria

There is very little information available which is specific to infrastructure in North East Victoria. State Government policy includes *The Victorian Freight Plan – Delivering the Goods* (2018), and *The High Productivity Freight Vehicle Plan – Moving More With Less* (2021). These plans identify five priorities:

- Manage existing and proposed freight corridors and places in conjunction with urban form changes
- Reduce the impact of congestion on supply chain costs and communities
- Better use of our rail freight assets
- Plan for Victoria's future port capacity
- Stay ahead of the technology curve

and four objectives for delivery:

- Reducing the cost of doing business
- Improving the efficiency of moving freight while minimising adverse impacts
- Better connecting Victorian businesses with their local, interstate and export markets
- Providing sufficient future capacity.

The High Productivity Freight Vehicle Plan is subservient to the Victorian Freight Action Plan. It aims to support expansion of the HVP network by increasing safe access and productivity. It describes the current status with respect to high productivity vehicles and identifies specific focus areas and priorities, including historic structural investments on the Hume Highway and future focus areas. These two documents provide somewhat useful context for the project.

Other reports identified in the literature review are either outdated or too strategic to be applied to this project. A document titled *Hume Region Planning for Freight Pilot* was published in 2013. It describes the strategic freight network in the region and identifies planning priorities, including the Hume Region Freight Improvement Program. The current status of the document is unclear and it is certainly outdated. Regional Development Australia has published a document titled *Hume Regional Priorities Sorted by Theme – Key*

Priorities (2019-2021). The document is a strategic inventory of regional planning priorities, which includes some high level reference to transport infrastructure and freight capability.

Transport efficiencies

With respect to log haulage and fuel use efficiency (as a surrogate for relative vehicle emissions under different fleet configurations) there is not a significant amount of Australian or regionally specific literature available. Ghaffariyan *et al* (2018) and Small & Ghaffariyan (2023) have published recent literature reviews which consider the state of log haulage efficiency and fuel use studies in Australia and internationally. These two papers reference 20 and 30 studies respectively, conducted and published since 2010. The low number of papers published on this topic provides an indication of the relatively small amount of work undertaken. Less than ten are specific to Australia, and several of these Australian papers are actually also literature reviews – reinforcing the paucity of locally specific analysis.

Nevertheless, there are some useful findings which can be applied to this project. Specifically, Small & Ghaffariyan identify five organising themes around forest product transport efficiency:

1. The application of High Productivity Vehicles (HPVs).
2. The influence of road networks and surfaces (e.g., proportion of sealed, gravel and natural surface roads).
3. The role of logistics and planning.
4. Fleet configurations and replacement strategies.
5. The application of fuel efficiency technologies.

The work also confirms the role of HPVs in reducing CO_2 emissions per unit of timber transported and advocates for combining network modelling of routes and route type with fuel consumption calculations to inform industry and government and guide decision-making. These findings strongly support the approach being used for the MRFH project.

In relation to the transport of manufactured products (e.g., sawn timber, plywood, engineered wood, panels and packaging), variations in road network type are less important (as practically all the haulage is on sealed roads). However, broadly the same approach can be applied with respect to fleet configuration and other variables.

There is a considerable amount of high-level literature, mostly published by government agencies, addressing state and national efficiency considerations and vehicle emissions, including for the manufactured products freight task. Of particular importance is the focus at both the state and national level on improving the potential for use of HPVs. None of the literature reviewed so far offers any specific information regarding the forest and wood products sector.

Stakeholder consultation

More than 30 stakeholders were consulted for the project. Stakeholder group included councils, state government, haulage contractors, forest growers and timber processors. Qualitative and quantitative data were collected regarding freight task performance issues, preferred and likely changes to freight configurations and infrastructure conditions, and specific infrastructure issues of importance to the relevant stakeholder.

INFRASTRUCTURE EFFICIENCIES

Overview

The regional forest and wood products haulage task is significant. Each year, combined truck movements average 159,000, moving nearly 5.7 million tonnes of freight comprising raw logs, processed timber and other inputs coming into the region, raw logs and residues moving within the region and manufacturing outputs moving within and exiting the region.

The road network for manufactured products exiting the region's processing facilities is generally of a very high quality. The region is well serviced by the Hume Highway and most (although not all) routes from mills to the Hume Highway support high productivity freight solutions (the exception is Hyne Timber at Tumbarumba).

Log haulage options are much more variable, both within forest and between forest and processing facilities. Variability is typically driven by topography and road configuration. However, there are some well-documented challenges associated with truck movements through smaller towns, such as Bright and Tumbarumba, as well as limitations imposed by choke points around narrow or load-limited bridges, in particular.

Current haulage task

The haulage task for the Hub's forest and wood products sector is quite complex. It comprises:

1. Raw log inputs from within the region.
2. Raw log inputs from outside the region.
3. Non-wood manufacturing inputs (e.g., resins and glues).
4. Manufactured or semi-manufactured inputs from outside the region (e.g., round logs and sleepers for preservation; pulp; and recycled paper and cardboard).
5. Manufactured and semi-manufactured products transferred within the region (e.g., cardboard sheets and sawn wood to Barnawartha for remanufacturing into packaging and engineered wood respectively).
6. Manufactured products exiting the region.

An average of 3.9 million tonnes of inputs are freighted within and into the region annually, including 1.4 million tonnes of saw log, 1.77 million tonnes of pulp log, and 751,000 tonnes of residues and other fibre and wood products, resins and other manufacturing inputs. Total manufactured output is about 1.76 million tonnes each year. Figure 2 summarises the annual freight movements (t/yr) for the ten-year analysis period. Figure 3 presents the average annual freight breakdown by product and Table 1 presents the annual estimated freight task for each year of the analysis[2].

Log transport

The large manufacturing base in the region means that, in addition to logs grown in the region, it has a history of importing significant fibre volumes from other regions. These include northern, central and south-east New South Wales, Gippsland in eastern Victoria, the Green Triangle and central Victoria. Inter-regional

[2] Quantity of goods is based on data provided by growers and processors and has been averaged over the ten year period.

imports have increased following the 2019/20 Black Summer fires which destroyed about 42,000 ha plantations in the region, resulting in a significant supply deficit until the mid-2030s at least.

Road based log transport is predominantly undertaken using B-double trailer configurations. There is a very small component of the log transport task within the region that is undertaken by single trailer configurations due to specific in-forest limitations. That is estimated at less than 5% of the overall log haulage task.

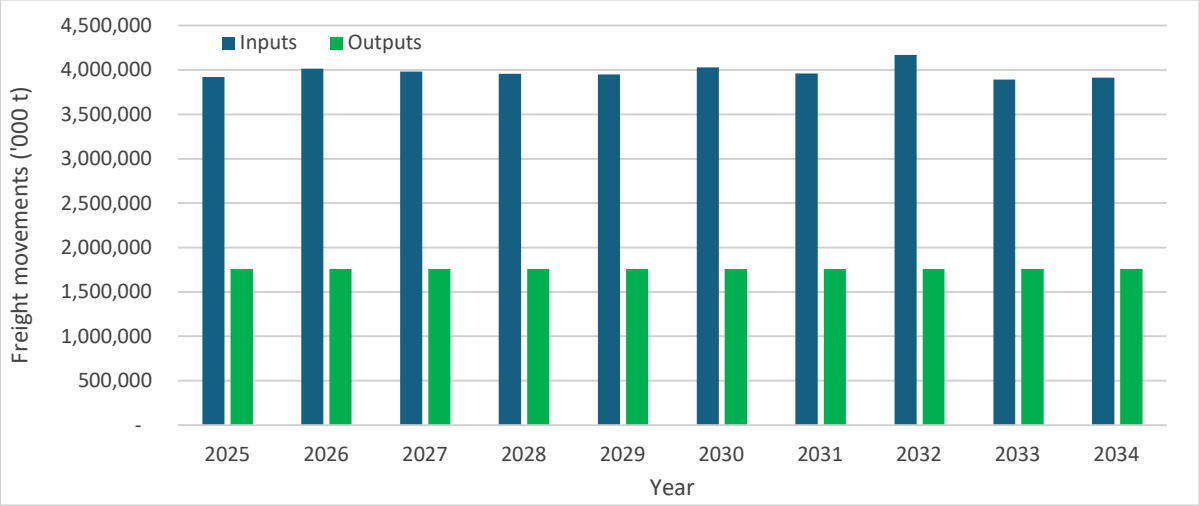

Figure 2: Summary of the annual regional freight task (tonnes)[3]

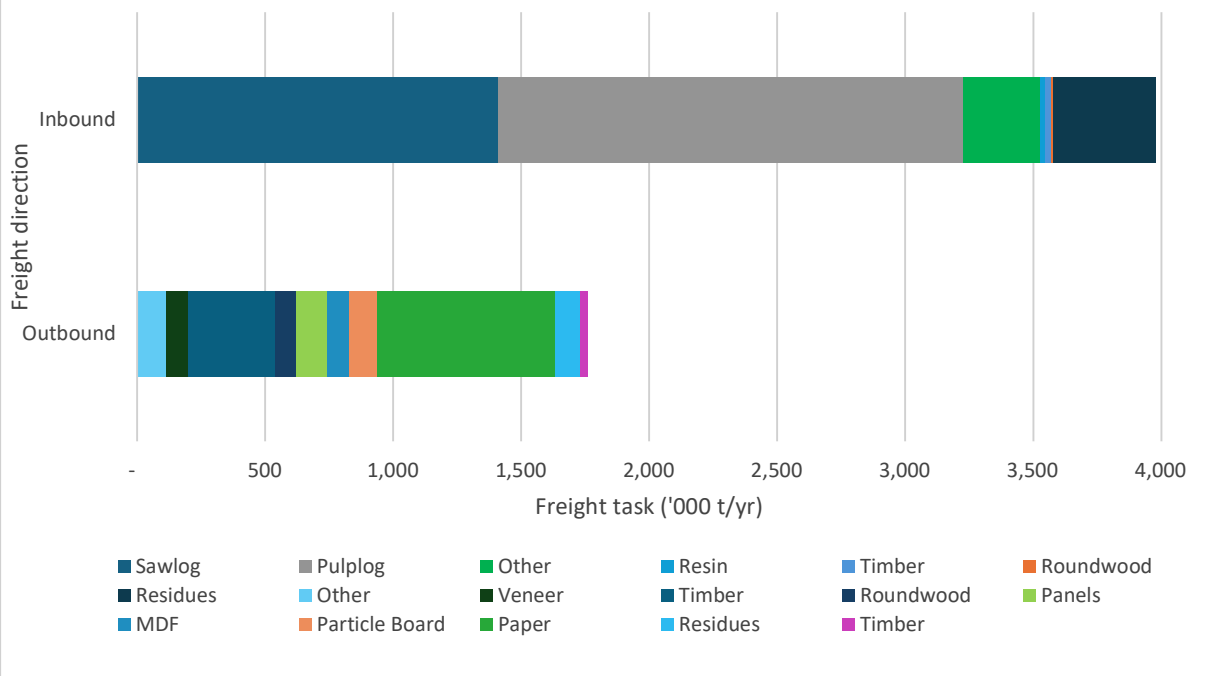

Figure 3: Average annual freight task elements by product

[3] For simplicity, the annual transfer of products within the region has been treated as an output in this figure

Table 1: Summary of annual freight task by freight category (Baseline 2025-2034)

Description		Movements (t/yr)										
Direction	Product	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total
In	Sawlog	1,398,349	1,394,250	1,393,706	1,385,993	1,336,390	1,340,651	1,321,086	1,570,290	1,467,325	1,492,339	**14,100,383**
In	Pulplog	1,771,690	1,870,579	1,835,981	1,820,328	1,861,508	1,936,893	1,887,749	1,850,125	1,673,396	1,669,664	**18,177,913**
In	Other fibre	430,217	430,217	430,217	430,217	430,217	430,217	430,217	430,217	430,217	430,217	**4,302,170**
In	Other inputs	320,702	320,702	320,702	320,702	320,702	320,702	320,702	320,702	320,702	320,702	**3,207,020**
Out	Veneer	85,000	85,000	85,000	85,000	85,000	85,000	85,000	85,000	85,000	85,000	**850,000**
Out	Timber	339,842	339,842	339,842	339,842	339,842	339,842	339,842	339,842	339,842	339,842	**3,398,420**
Out	Roundwood	81,598	81,598	81,598	81,598	81,598	81,598	81,598	81,598	81,598	81,598	**815,980**
Out	Panels	123,694	123,694	123,694	123,694	123,694	123,694	123,694	123,694	123,694	123,694	**1,236,940**
Out	MDF	85,306	85,306	85,306	85,306	85,306	85,306	85,306	85,306	85,306	85,306	**853,060**
Out	Particle Board	110,000	110,000	110,000	110,000	110,000	110,000	110,000	110,000	110,000	110,000	**1,100,000**
Out	Paper	693,013	693,013	693,013	693,013	693,013	693,013	693,013	693,013	693,013	693,013	**6,930,130**
Out	Other	240,683	240,683	240,683	240,683	240,683	240,683	240,683	240,683	240,683	240,683	**2,406,830**
	Total	**5,680,095**	**5,774,885**	**5,739,742**	**5,716,376**	**5,707,954**	**5,787,599**	**5,718,890**	**5,930,470**	**5,650,777**	**5,672,059**	**57,378,847**

Manufactured product transport

There is a considerable volume of manufacturing inputs (including partly manufactured wood and fibre products) delivered into the region and a very large volume of manufactured wood and fibre products transported out of the region. Destinations include major population centres such as Melbourne, Sydney and other state capitals, as well as regional centres. All freight leaving the region requires road transport from the processing facility (note that some freight is transported by road to the Bomen intermodal facility where it is then transferred to rail). Both inbound and outbound manufactured goods are transported using the full range of options from small rigid trucks to A-doubles. The preferred truck configurations for manufactured products are very dependent on the destination of the freight. For example, direct transport of sawn timber to smaller regional markets is usually undertaken using small rigid trucks or semi-trailers, whereas interstate and long-haul travel to major population centres uses B-double and A-double configurations. An example was provided by a regional manufacturer that mostly transports manufactured goods to Sydney using semi-trailers because of access limitations at hardware store delivery sites, which means that opportunity for increased efficiency in outbound freight is constrained by end market factors.

Haulage impacts

Impact analysis of the haulage task is based on total loaded truck movements, fuel use and carbon emissions. The baseline haulage configuration settings were developed using input from the forest and wood products sector in the region and are summarised in Table 2. Applying this baseline, forecast annual loaded truck movements average 159,000/yr. The largest proportion of freight moved comprises raw logs, representing 39% of the total goods movement task (when measured in tonnes/yr). Total inputs represent 56% and outputs 44% (including residue transfers) or 34% (excluding residue transfers).

It is important to note that loaded truck movements do not represent the entire haulage task. Insufficient data were available to accurately estimate unloaded truck movements and impacts. There are several complications that include truck start and finish points, different loaded and unloaded routes (e.g., for the Bombala log haulage task) and the proportion of backloads achieved. This analysis has therefore focused on loaded truck movements only.

Table 2: Baseline haulage task impacts by freight category

		Task size		Loaded truck movements		Fuel use	CO2e	
Freight category		(t/yr)	%	(#/yr)	%	(l/yr)	(t/yr)	%
Inputs	Logs	3,227,830	56%	82,240	52%	3,393,720	11,484,565	50%
	Other	750,920	13%	29,485	19%	949,185	3,212,095	14%
Outputs	Products	1,518,455	26%	38,405	24%	2,249,295	7,611,750	33%
	Other	240,685	4%	8,770	6%	188,755	638,760	3%
Total		5,737,890		158,900		6,780,954	22,947,170	

The baseline haulage task utilises an estimated 6.8 million litres of fuel annually and is responsible for 22.9 million tonnes CO_2e in emissions. It is important to note that fuel use averages about 1.05 l/t for logs and about 1.48 l/t for manufactured products, indicating that log transport is more efficient. That is largely due to the higher proportion of HPVs in the log haulage fleet. Fuel use estimates were based on a range of academic and Government resources, with specific reference to the Queensland Department of Transport

and Main Roads, (2021). Emissions calculations were based on the approach applied by the Australian Transport and Infrastructure Council (2016).

The core assumptions for truck configurations used in the baseline analysis are presented in Table 3.

Table 3: Truck configuration assumptions for baseline analysis

	Truck configuration			
Metric	**Rigid**	**Semi-trailer**	**B-Double**	**A-Double**
Payload (tonnes)[4]	15	25	40	56
Fuel use (l/100km)[5]	23.49	34.19	42.06	48.29

Haulage mapping

The identification of haulage routes and quantification of haulage for specific routes relied predominantly on input from industry stakeholders. Processors provided key routes and freight task size and growers provided data in a range of formats, ranging from large spatial data sets with haulage routes specified by location, volume and year, through to indicative average annual volumes specified for broad localities. Considerable analysis was required to normalise the various datasets, convert to a common measurement unit (tonnes) and consolidate to a regional scale set of outputs. The total haulage task was analysed by year and by categories (inputs, outputs, logs and manufactured products). Consolidated map outputs are presented in Figure 4 to Figure 7.

Road infrastructure description

Overview

The Hub region is well serviced by an established and well-understood road infrastructure asset base which operates from the forest, through the local and state government road networks to the national road network. The Hume Highway forms the backbone of the region's transport network, efficiently connecting the region to the entire east coast. The industry's national significance in terms of manufacturing concentration and scale is important when considering the need for efficient transport outcomes. The road network configuration in the region has some unique characteristics compared to many other regions.

First, a very large proportion of the road haulage task is undertaken on roads within the plantation estate. In New South Wales, the Softwoods Working Group (2015) has previously estimated that about 70% of the total log haulage requirements are serviced by the internal forest road network, a situation that is largely replicated in Victoria.

Second, the plantation estate is located in a fairly narrow band situated between public native forests in the alpine regions to the east, and the Hume Highway to the west. As noted, proximity to the Hume Highway provides considerable haulage advantages for the industry. However, it also brings large amounts of other freight and tourist traffic through the region and there are other important road users including the agricultural industry and domestic users (for example school buses). Traffic interaction with other road users, particularly for log trucks, is significant.

[4] Brown (2021)

[5] Transport and Infrastructure Council (2016)

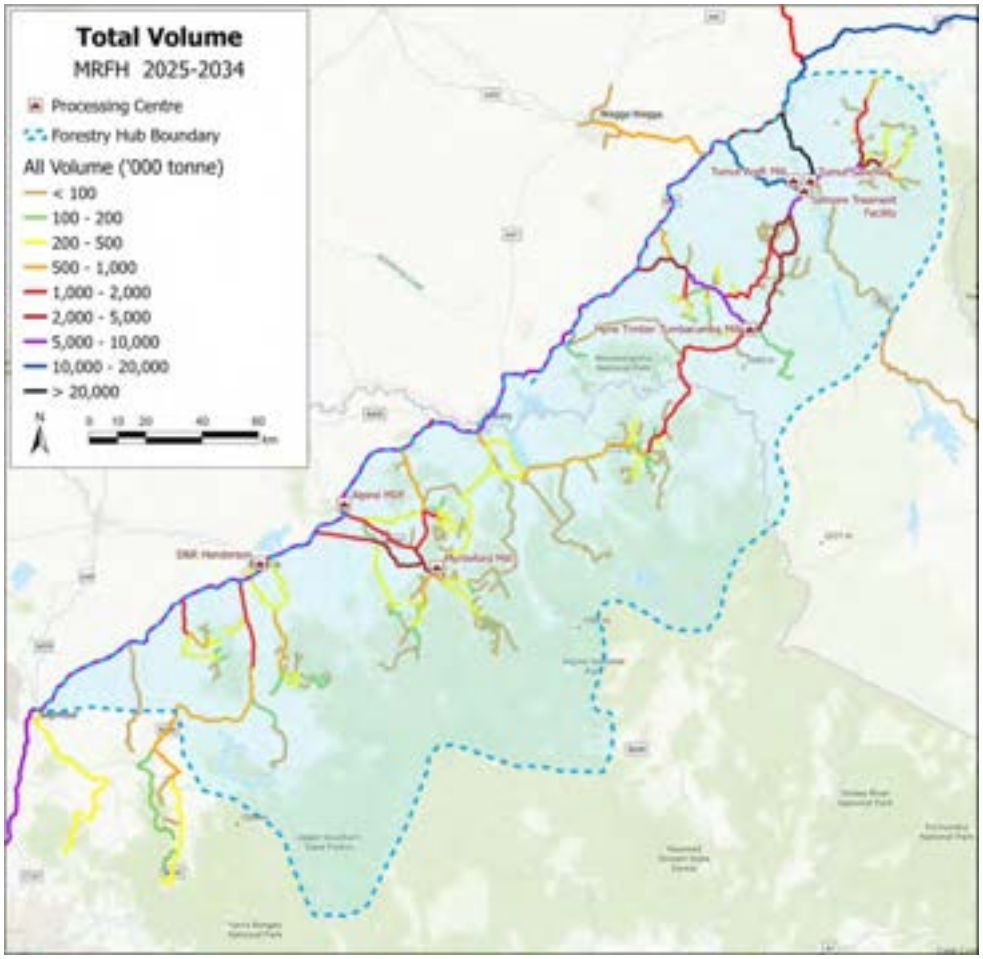

Figure 4:Regional haulage task – all freight (2025-2034)

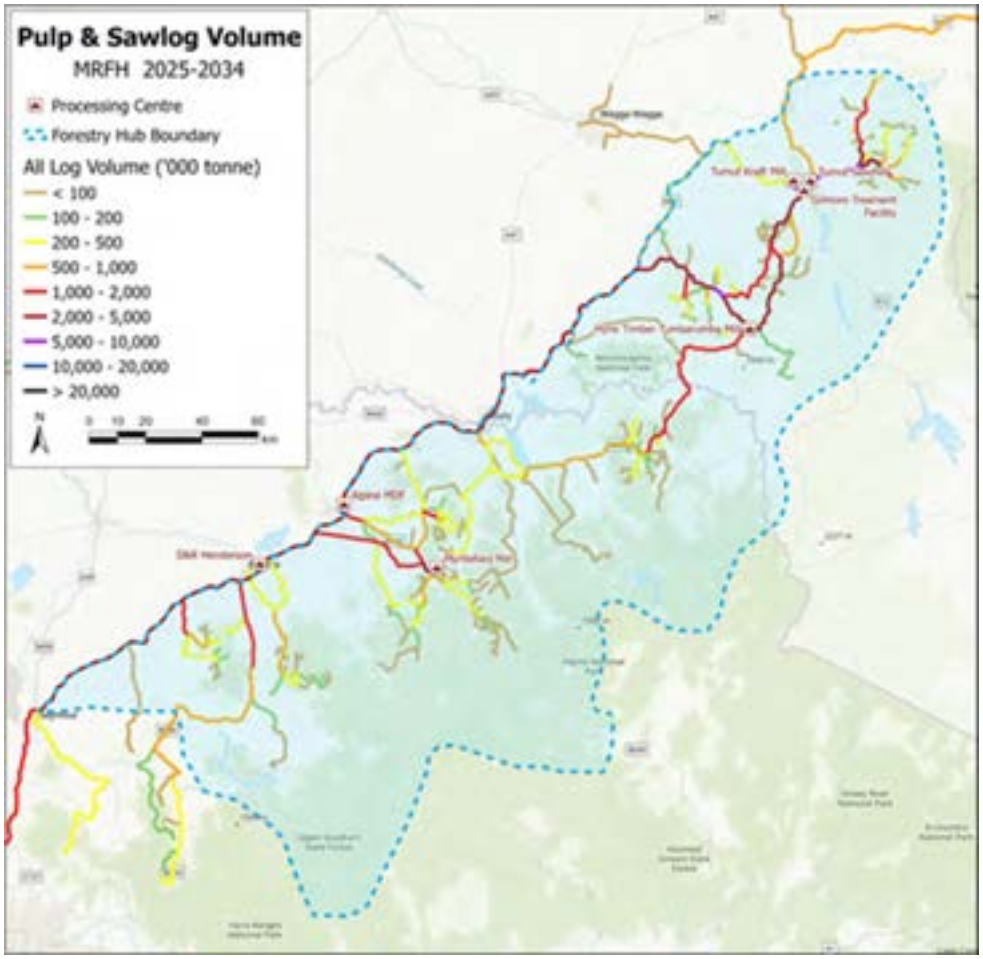

Figure 5: Regional haulage task - all logs (2025-2034)

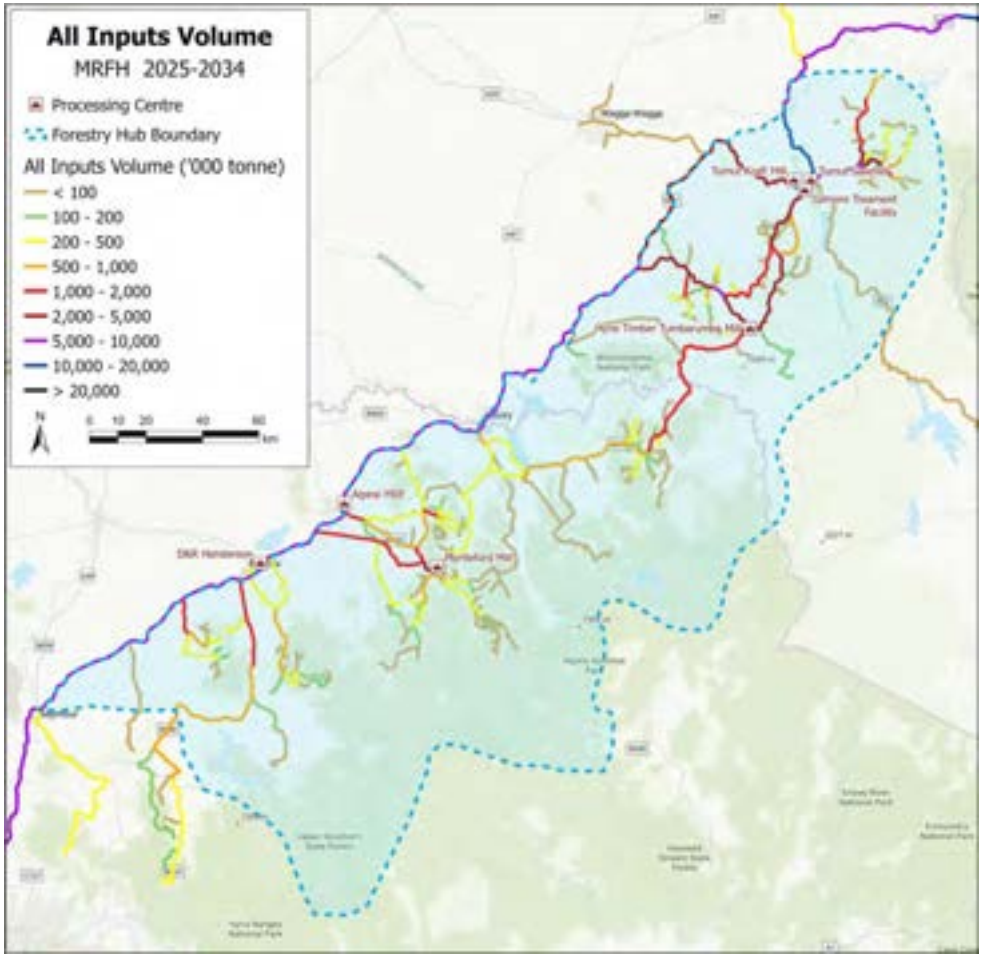

Figure 6:Regional haulage task – all inputs (2025-2034)

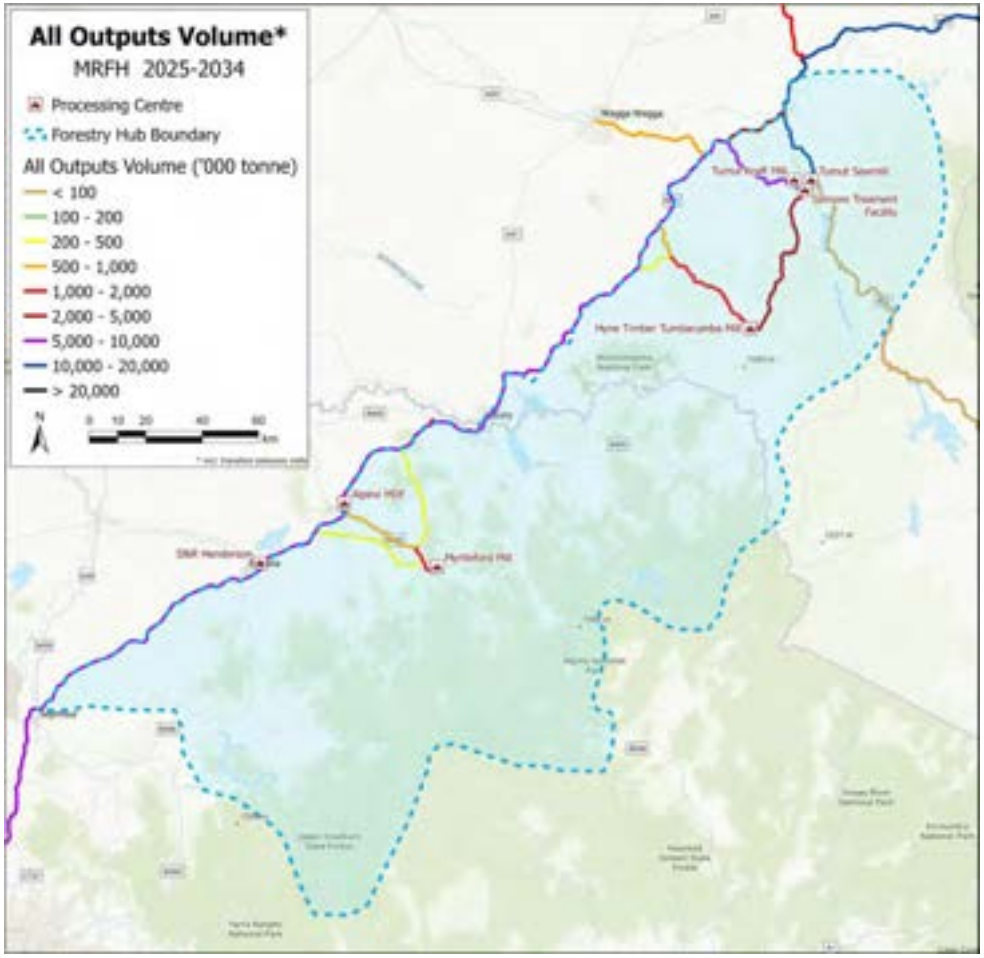

Figure 7: Regional haulage task - all outputs (2025-2034)

Identification of infrastructure issues

The stakeholder consultation process undertaken for the project identified several specific road infrastructure issues. In particular:

- The region is relatively densely populated and is an important tourism destination. There is potential for interaction between the forest and wood products sector and other significant road users.
- Despite considerable focus over a long period on developing the road infrastructure quality and suitability, there remain specific transport infrastructure challenges, particularly in and around Tumbarumba.
- The salvage harvest effort following the 2019/20 fire season resulted in a significant short term increase in log truck movements over key haulage routes, followed by a considerable period of wet weather, which has resulted in an abnormal level of impact for some critical routes, such as the section of Jingellic Road to the east of Holbrook.

The identified issues fall into three broad categories:

1. Compromised traffic efficiency (bottlenecks) and safety issues.
2. Lack of, or the need for alternative routes.
3. Lack of clarity about responsibility for management of specific roads.

Assessment of infrastructure priorities

Priority assessment method

Establishing a priority setting framework to identify which issues should form the focus for industry attention and communication with other road management authorities is challenging. Initially it was proposed to apply the approach used for Victoria's Timber Industry Road Evaluation Study (TIRES). However, there were practical impediments to applying the TIRES approach which included regional scale, the nature of the information gathered and the relatively low reliance on local government road infrastructure compared to some other regions.

To develop a more relevant priority setting framework, the following adapted approach was applied:

1. New or upgraded infrastructure requirements for priority ranking were identified through the stakeholder consultation process.
2. The priority setting formula was adjusted to focus on:
    a. Freight weighted by quantum (tonnes/yr) and year of harvest (earlier harvest has higher priority).
    b. Whether or not safety is an issue.
    c. The number of years that the road is proposed for use.
    d. The level of priority indicated by the industry.
3. Outcomes were ranked on a scale from Observe through to Urgent.

Ranking parameters

For each specific road infrastructure issue identified by the industry, the following approach was applied to determining the ranking parameters.

Haulage task ranking

For each specific infrastructure issue, the annual haulage task was quantified. Annual volume was assigned a weighting from 1 (for 2025 volumes) to 0.45 (2034 volumes) to reflect the relative importance of earlier

harvest events. Those weighted average annual volumes were then assigned a rank from 0.1 (<5,000 t/yr) to 12 (600,000t/yr).

Years in use

For each specific issue a years-in-use rank was applied from 0.1 (one year) to 1 (ten years).

Safety

Safety issues were ranked as follows:

No specific issue:	0.1
Moderate safety issue:	0.5
Clear safety issue:	1.0

Industry priority

Industry priority was ranked as follows:

No specific issues:	0.1
Low:	0.25
Low-medium:	0.5
Medium:	0.75
Medium-high:	1.0
High:	1.25
Very high:	1.5

Calculation

Each of the four variables was multiplied to determine a priority rank, as follows:

Observe:	<0.1
Low:	0.1-1
Medium:	1-2
High:	2-3
Very high:	3-5
Urgent:	>5

Assessment of infrastructure upgrade costs

No specific information was provided about the potential costs of addressing the identified road infrastructure issues. In the absence of regionally specific data, the project team applied general costs informed by a road construction cost and infrastructure procurement benchmarking update which is applicable to generating high level estimates of infrastructure works costs (Commonwealth Department of Infrastructure, Regional Development and Cities, 2017). Additional information was provided by Greater Hume Shire and Snowy Valleys Council which are more contemporary as well as being somewhat lower than the Commonwealth figures. However, it was also noted that prices for capital expenditure continue to increase rapidly. The data are presented in Table 4, including the assumptions used for this analysis.

Table 4: Estimated road infrastructure upgrade costs for the Hub

Category	Commonwealth	Local councils	Assumed rate
Narrow bridge replacement ($/bridge)	1,000,000	1,000,000	1,000,000
Additional lane construction (inc overtaking) ($/lane/km)	1,000,000	500,000	650,000
Bitumen road reconstruction/construction ($/lane/km)	1,500,000	500,000	1,500,000*
Bitumen road resurfacing ($/lane/km)	500,000	150,000	200,000

Gravel road reconstruction/construction ($/km)	500,000	300,000	375,000
Gravel road upgrade ($/km)	250,000	50,000	75,000

* Note that $1.5 million has been retained here as it relates only to Courabyra Rd which is a very large project that has likely to costs implications which are currently unknown.

It is important to note that these cost estimates reflect the basic works requirements to replace or provide immediate solutions to known issues. Where more complex works are required, for example significant realignment or redesign, accurate cost estimates will require a detailed business case to be developed for each proposed upgrade.

Results

A total of 27 specific road infrastructure issues were identified and at least $127.8 million worth of potential capital works (including the Jingellic Road upgrade which is already the subject of a detailed business case). Table 5 presents the summary of estimated capex requirements by infrastructure priority. Table 6 summarises the infrastructure priority assessment results.

It is important to note that, apart from Jingellic Rd, for which a business case has been prepared, the capex costs presented in this analysis are high level estimates based on untested assumptions about the nature of the issue and the likely solution. Each will require further detailed business case analysis and expert engineering design work to determine accurate costs.

Table 5: Summary of estimated capex requirements by priority[6]

Priority	Capex requirements
Observe	$20,000,000
Low	$9,250,000
Medium	$1,000,000
High	$2,400,000
Very High	$73,800,000
Urgent	$21,375,000
Total	**$127,825,000**

[6] All cost estimates are in 2025 dollar values

Table 6: Infrastructure priority assessment results for identified issues

	Description					Ranking Assessment							
#	LGA	Road name	Location	Issue	Proposed solution	Weighted annual volume	Safety	Volume rank	Usage	Industry priority	Rank	Priority	Estimated capex
1.1	Strathbogie/ Benalla	Warrenbayne Road	Boho Plantation	Alternative route	Alternate route, pavement upgrade	109,200	0.5	0.4	1	1.0	0.2	Low	$5,625,000
2.1	Snowy Valleys	Tumbarumba Bypass	Courabyra Rd	Tumbarumba Bypass	Alternate route reconstruction	342,531	1.0	6.9	1	0.5	3.5	Very High	$39,000,000
3.1	Snowy Valleys	Jingellic Road*	Entire road	Recovery	Upgrade	120,675	1.0	2.5	1	1.3	3.1	Very High	$32,300,000
4.1	Snowy Valleys	Wagga-Tumbarumba Road	Glenroy Bridge	Narrow Bridge	Upgrade	499,100	1.0	10	1	1.3	12.5	Urgent	$1,000,000
4.2	Wagga Wagga City	Wagga-Tumbarumba Road	Murraguldrie Bridge	Narrow Bridge	Upgrade	71,271	1.0	1.5	1	1.3	1.9	Medium	$1,000,000
4.3	Snowy Valleys	Wagga-Tumbarumba Road	Jacksons Bridge	Narrow Bridge	Upgrade and realign	334,387	1.0	6.7	1	1.3	8.4	Urgent	$10,000,000
4.4	Snowy Valleys	Wagga-Tumbarumba Road	Between Cararoo Road and Rosewood Park Road	Steep and slippery	Resurfacing & overtaking lane	597,489	1.0	12	1	1.3	15.0	Urgent	$4,500,000
5.1	Snowy Valleys	Batlow Road	North of Courabyra Road	Potential for overtaking lane	Overtaking lane	340,219	1.0	6.9	1	0.8	5.2	Urgent	$1,625,000
5.2	Snowy Valleys	Batlow Road	Between Windalga and Windowie	Potential for overtaking lane	Overtaking lane	497,180	1.0	10	1	0.8	7.5	Urgent	$1,625,000
5.3	Snowy Valleys	Batlow Road	Between Blue Metal Road and Poison Flat Road	Potential for overtaking lane	Overtaking lane	341,112	1.0	6.9	1	0.8	5.2	Urgent	$1,625,000
6.1	Snowy Valleys	Tooma Road	Henry Angel Bridge	Narrow Bridge	Upgrade	12,828	1.0	0.3	1	0.8	0.2	Low	$1,000,000
6.2	Snowy Valleys	Tooma Road	Paddys River Bridge	Narrow Bridge	Upgrade	12,828	1.0	0.3	1	0.8	0.2	Low	$1,000,000

6.3	Snowy Valleys	Tooma Road	Clarke's Hill	Visibility in event of breakdown or incident	Overtaking lane	12,828	1.0	0.3	1	1.0	0.3	Low	$1,625,000
7.1	Greater Hume	Little Billabong Road	Volkins Bridge	Narrow Bridge	Upgrade	258,405	1.0	5.2	1	0.8	3.9	Very High	$1,000,000
8.1	Snowy Valleys	Wondalga Road	Five Ways, BB Feeder and between Five Ways and Short Cut Rd	Realignment or redesign of road intersection	Realign / redesign	222,643	1.0	4.5	1	0.8	3.4	Very High	$1,500,000
9.1	Snowy Valleys	Greenhills Access Road	Between B4 and B5	FCNSW Road with low design speed and poor alignment	Realign and change of ownership	92,740	1.0	1.9	1	1.3	2.4	High	$2,400,000
10.1	Snowy Valleys	Bombowlee Creek Road	Section on Crown Land	No owner but council permission required for works	Resolve responsibility	498,806	1.0	10	1	0.5	5.0	Very High	
10.2	Snowy Valleys	Bombowlee Creek Road	At Tumut	Interact with other road users	…	499,033	1.0	10	1	0.5	5.0	Very High	
10.3	Snowy Valleys	Bombowlee Creek Road	Blue Cut Bridge	Narrow bridge inadequate for requirements	…	499,033	1.0	10	1	1.0	10.0	Urgent	$1,000,000
11.1	Cootamundra -Gundagai	Kangaroo Vale Property	Logical Exit	Interact with other road users	…	7,639	1.0	0.2	0	0.1	0.0	Observe	$20,000,000
12.1	Indigo	Myrtleford Yackandandah Rd	At Yackandandah	Interact with other road users	…	39,989	0.5	0.8	1	0.1	0.0	Observe	

13.1	Indigo	Yackandandah Road	At Intersection with Beechworth Wodonga Rd	Interact with other road users	…	840	0.5	0.1	1	0.1	0.0	Observe
14.1	Indigo	Beechworth Wodonga Road	At Beechworth	Interact with other road users	…	840	0.5	0.1	1	0.1	0.0	Observe
15.1	Alpine	Great Alpine Road	NW of Myrtleford	Interact with other road users	…	373,935	0.5	7.5	1	0.1	0.4	Low
15.2	Alpine	Great Alpine Road	SE of Myrtleford	Interact with other road users	…	70,300	0.5	1.5	1	0.1	0.1	Observe
15.3	Alpine	Buffalo River Road	SW of Myrtleford	Interact with other road users	…	74,615	0.5	1.5	1	0.1	0.1	Observe
15.4	Alpine	Great Alpine Road	Exiting Porepunkah	Interact with other road users	…	28,792	0.5	0.6	1	0.1	0.0	Observe

* Jingellic Rd is the subject of an existing Softwoods Working Group business case

Specific road infrastructure priority issues

Detailed discussion on a selection of specific infrastructure issues is presented below.

Warrenbayne alternative route

The Warrenbayne plantations are located south of the Hume Highway near Violet Town. Logs harvested in the Boho plantation are currently transported by truck south to Bonnie Doon Rd, then north to the Hume Hwy and then to the relevant customers. The proposed alternative route, along Davies and Dobsons Roads, north-east to the Midland Hwy would reduce the haul distance by about 30km, or about 45 minutes travelling time. The current and alternate routes are presented in Figure 8.

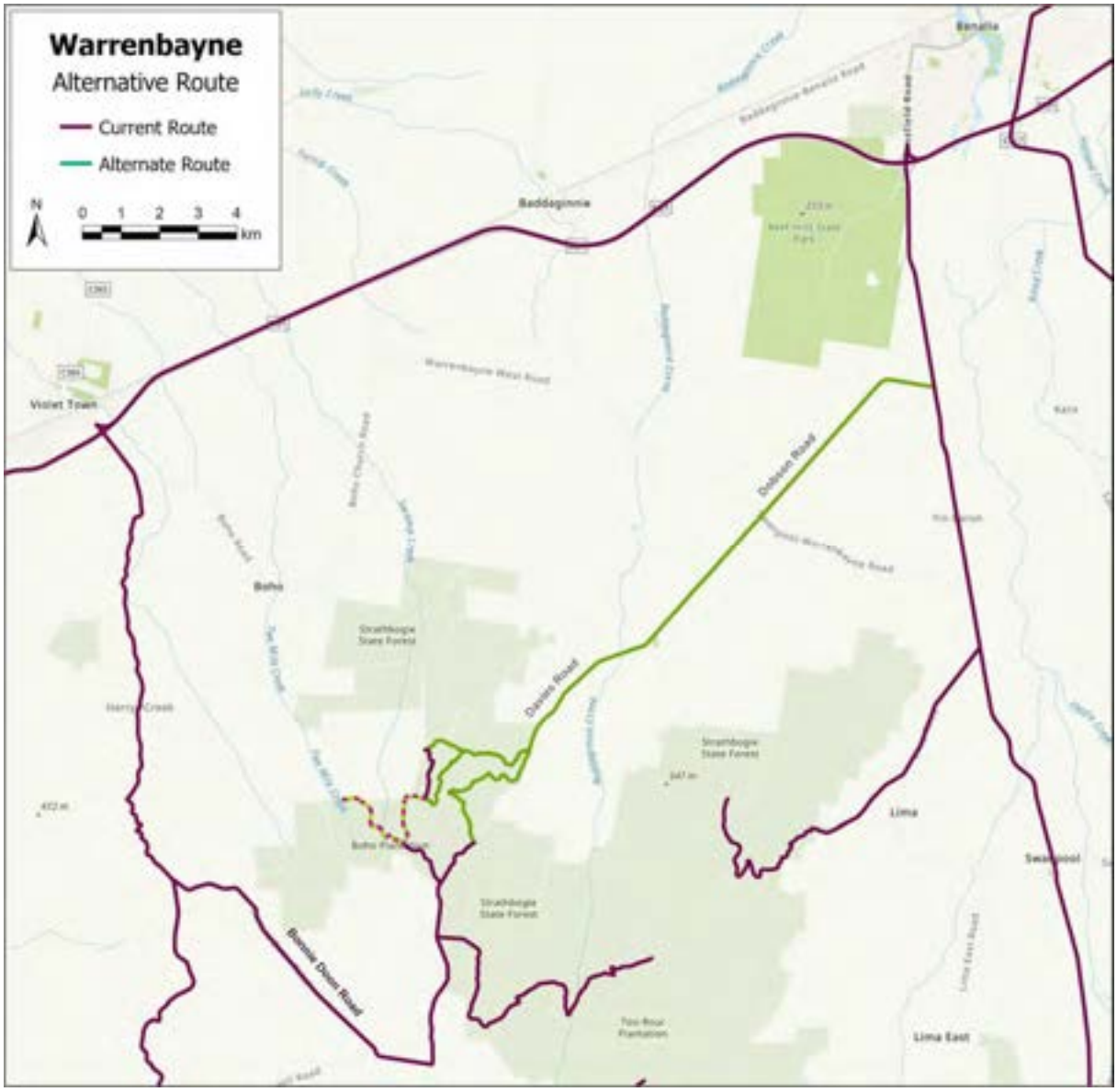

Figure 8: Proposed alternative route for log haulage from the Warrenbayne plantations complex

Stakeholder consultation indicated that there is some local community concern about the potential use of this alternative route, which may be alleviated through consideration of minor upgrades.

Courabyra Road alternative route

Bypassing Tumbarumba along Courabyra Rd has the potential to address several identified issues, including bridge load and width limits within and adjacent to the township, and removing trucks from the main street. It was identified by a large number of industry stakeholders as an important priority for future consideration. Upgrading Courabyra Rd to a standard that would enable it to transfer log truck traffic from Batlow Rd would require a significant capital investment in pavement improvements, realignment and widening. Using the capex estimation approach outlined above, the minimum capital cost is estimated at $39 million.

Figure 9: Proposed alternative route along Courabyra Rd, bypassing Tumbarumba township

While the Courabyra Rd upgrade, if demonstrated to be viable, would provide solutions as outlined above, there are also recognised challenges which would include the need to acquire private land for realignments and potential negative impacts on existing businesses and farming enterprises. Any business case would need to carefully consider and balance the benefits and potential impacts.

Jingellic Road upgrade

The Softwood Working Group has completed a business case for upgrading Jingellic Rd in three stages, covering approximately 33 km east from Holbrook (refer to Figure 10).

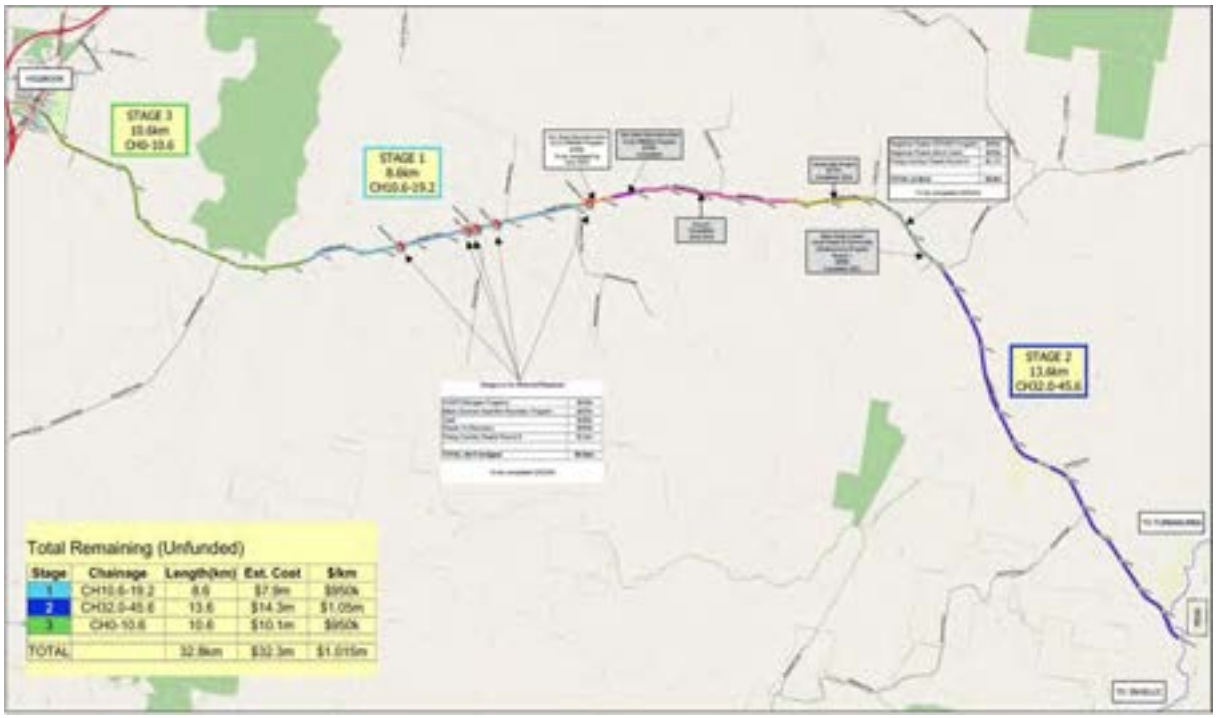

Figure 10: Proposed Jingellic Rd upgrade and repair works

The business case for the proposed road upgrade states that the

*"… road requires extensive upgrades to be able to **safely** handle the current and future transportation needs of this important thoroughfare that services the day to day needs of the local communities (including school buses) as well as the commercial requirements of the agricultural, horticultural, timber and tourism industries. Following the catastrophic wildfires in 2019-20, Jingellic Rd was a key haulage route for dramatically increased volumes of plantation logs that had to be quickly salvaged from the burnt forests. This unexpected activity followed by an extended period of severe wet weather has resulted in the road deteriorating rapidly over the last two years. This has manifested itself in the form of serious, substantial, and on-going pavement failures and pot-hole development that cannot be remediated adequately by patching.*"

The proposed repairs and upgrades are considered to be the minimum work required to address the significant pavement failures, loss of transport utility and increase in road safety concerns (refer to Figure 11).

Figure 11: Pavement damage and deformation on Jingellic Rd (SWG business case)

Other proposed upgrades

The majority of additional proposed upgrades relate to bridges, overtaking lanes and other improvements to address safety and shared road concerns in and around Tumbarumba. While there is a considerable focus on log haulage into Tumbarumba, there are also recognised issues with manufactured products exiting Tumbarumba towards the Hume Highway, particualrly in relation to narrow bridges where it is difficult or impossible for trucks of any size to pass other vehicles, for example, the Mannus Creek bridge as shown in Figure 12).

Particular concerns were raised by stakeholders that the increasing volume of tourism traffic, especially large caravans, is resulting in increased potential safety issues in and around Tumbarumba.

Potential interaction between other road users

There is substantial potential for increased interaction between forest and wood products haulage (particularly but not only log haulage) and other road users. As noted above, the continued increase in tourism traffic, particularly larger caravans, is a very real road safety concern. The region is quite unique, being adjacent to the alpine regions of both New South Wales and Victoria, with a relatively high rural population and easy access to numerous small towns and villages from the Hume Hwy. There has also been an increase in industrial traffic associated with construction of HumeLink East and West. For tourism and HumeLink traffic, lack of familiarity with the driving conditions and inexperience sharing roads with primary and secondary industries freight vehicles is recognised by stakeholders as a very important ongoing priority.

Figure 12: Narrow bridge at Mannus Creek on the Tumbarumba-Wagga Road

FUTURE STATE ANALYSIS AND COMPARISON

Overview

High Productivity Vehicles (HPVs) and Performance-Based Standards (PBS) offer significant advantages to industry, governments and the community more broadly by delivering improved road transport efficiency, reduced fuel use and greenhouse gas emissions, and improved safety outcomes. Each of the Victorian, New South Wales and Commonwealth Governments have developed policy positions which encourage increased use of HPVs and PBS solutions by supporting innovation in vehicle designs and investing in infrastructure to facilitate more efficient road transport.

The forest and wood products sector in the Hub region has been at the forefront of improved transport efficiency, especially in relation to log transport, for about two decades. Almost all logs are now transported on B-doubles, except where in-forest road constraints prevent it. A reasonable proportion of the manufactured product output is now transported on A-doubles, although a mix of configurations from small rigid trucks to larger combinations is used.

There are significant efficiencies to be realised if the industry can further capitalise on the state and Federal government policy shift towards increased use of HPVs and PBS for truck transport. However, there also continues to be some resistance to larger vehicles from some areas of government, some parts of industry and in the community more broadly.

This section addresses the improvements in transport efficiency that can be delivered with changes in truck configurations for the Hub's haulage task.

Development of scenarios

Identification of potential efficiencies

The current state analysis indicates that log haulage is the currently most efficient transport category for the Hub. Logically, that would suggest that the next focus area for efficiency gains is likely to be either for finished products or other fibre and non-fibre inputs. However, the reality is that other fibre and non-fibre inputs are difficult to control and transport configurations for manufactured outputs are generally dictated by the capacity of the destination (either quantum of product or physical site constraints). Based on these considerations, the most likely opportunity for improved transport efficiency relates to log haulage. Given the region is a net importer of raw logs and that logs are transported over considerable distances both within and from outside the region, that presents as a reasonable focus for further efficiencies.

Current configurations

Industry stakeholders identified that current log haulage is dominated by B-doubles which represent somewhere between 95-98% of the fleet. The initial move to B-doubles began in the early to mid-2000s and is now well established. The small proportion of single (semi-trailer style) trailer configurations is dictated by specific in-forest access limitations.

Potential configurations

Several potential alternative configurations were identified during the stakeholder consultation. There is currently a strong focus on increasing the proportion of high mass limit (HML) options for B-double configurations. There are also intermediate solutions, such as alternatives to traditional dog and trailer

designs, which in some cases can deliver almost equivalent to B-double carrying capacity if HML is in place. However, the greatest efficiency gains are likely to be delivered through increased use of A-double configurations for log haulage.

It is important to note that there is an enormous range of potential configurations based on factors such as trailer design, axle distribution, net tare, sweep path and the weight of trailer construction materials. It is not possible to address the full range of variables for a study at this level. Therefore, the approach has been to assess potential efficiency gains based on variations between broad configurations (singles, B-doubles and A-doubles) for log transport, based on the core metrics presented in Table 3.

Scenarios

Four scenarios were developed for consideration. Scenario 1 is the current state. The other three scenarios quantified the impacts on truck movements, fuel use and emissions based on varying the proportion of B-doubles and A-doubles for log transport (refer to Table 7). The proportion of singles was held steady at 5% of the total log transport task.

Table 7: Transport efficiency scenarios

	Truck configuration (%)		
Scenario	**Single**	**B-double**	**A double**
1 (Current State)	5	95	0
2	5	50	45
3	5	35	60
4	5	5	90

Analysis and results

Comparison of the results for each of the four scenarios clearly demonstrates the potential efficiencies in terms of reduced truck movements, fuel efficiency and greenhouse gas emissions that result from increased use of A-doubles for log transport.

Total truck movements

Increasing the proportion of A-doubles delivers between 4-6% reduction in total truck movements as shown in Table 8.

Table 8: Changes in truck movements between scenarios

Scenario		Logs	Other goods	Total	Change
1 (Current State)	#	80,696	76,662	157,357	
	%	52	48	100	
2	#	69,490	76,662	146,152	11,205
	%	48	52	100	4
3	#	66,076	76,662	142,738	14,619
	%	47	53	100	5
4	#	60,165	76,662	136,826	20,531
	%	44	56	100	6

Total fuel use and emissions

Increasing the proportion of A-doubles delivers between 1-4% reduction in total fuel use as shown in Table 9 (note, emissions change rates are the same as fuel change rates).

Table 9: Changes in fuel use between scenarios

Scenario		Logs	Other goods	Total	Change
1 (Current State)	#	3,393,722	3,3877,232	6,780,954	
	%	51	49	100	
2	#	3,370,819	3,3877,232	146,152	11,205
	%	50	50	100	1
3	#	66,076	3,3877,232	142,738	14,619
	%	48	52	100	3
4	#	60,165	3,3877,232	136,826	20,531
	%	47	53	100	4

Comparison for log transport

Table 10 summarises the outcomes for changes in truck movements, fuel use and emissions for the log haulage task under each of the four scenarios.

Table 10: Comparison of key metrics for scenario changes for log transport

Metric	Loaded truck movements		Fuel use			Emissions		
Unit	Tonnes/ load	# annual	Litres/yr	Litres/tonne	Litres/load	tCO2e/yr	tCO2e/tonne	tCO2e/load
Scenario 1	39	82,238	3,393,722	1.05	41.27	11,484,566	3.56	140
Scenario 2	40	80,696	3,370,819	1.04	41.77	11,407,059	3.53	141
Scenario 3	46	69,490	3,156,656	0.98	45.43	10,682,320	3.31	154
Scenario 4	54	60,165	2,983,220	0.92	49.58	10,095,403	3.13	168

Discussion

The analysis demonstrates that changes in log haulage configuration can deliver material reductions in truck movements, fuel use and emissions. While the assessment did not consider changes in configuration for manufactured products, increased use of B-doubles and A-doubles is also likely to deliver further improvements.

Improved safety outcomes

While the potential fuel use and emissions improvements will help the industry to improve efficiencies, the most important outcome is the potential for reduction in log truck movements and therefore potential interactions between log trucks and other traffic. Even a relatively small shift from B-doubles to A-doubles results in a reduction in truck movements by about 11,000 per annum (c. 14%). That means, in practical terms, 14% fewer opportunities for log trucks and other traffic to interact on rural roads.

Challenges to improved transport efficiency

The challenges to increased application of HPVs and PBS approved vehicles for the regional haulage task include:

1. **In-forest limitations**: there is considerable evidence to suggest that the sweep path for A-doubles is better than for B-doubles for most road designs and therefore much of the forest estate is likely to be capable of supporting larger truck configurations. However, there are still civil engineering challenges such as truck turn-arounds and take-offs.
2. **Receiving point limitations**: For some processing facilities in the region, there are current configuration challenges that limit their ability to accept truck configurations.
3. **Sentiment**: There is a level of resistance within the industry and with some levels of government to introducing larger vehicle configurations.

- **Commercial risk**: There is at least a perception that the willingness of haulage operators to invest in and deliver innovative haulage solutions is compromised by other supply chain actors seeking to gain an equal or greater benefit from the efficiency gain without making a concomitant investment. Similarly, there is a concern among growers that the potential costs of upgrading the in-forest road network to cater for larger vehicle configurations will not be captured through haulage rate adjustments.

DISCUSSION

Overview

The transport task for the forest and wood products sector within the Hub region has been historically well defined. The road network is well understood, as is the size of the haulage task. The impacts of significant fire events, especially the 2019/20 Black Summer fires, resulted in disproportionate impacts on important parts of the regional road network but these impacts have been quite focused, for example on Jingellic Road. In both New South Wales and Victoria, there has been successful effort over a long period of time to work with both local and State Governments to ensure that key routes are identified and managed. One of the best examples is Gocup Road, between Tumut and Gundagai.

The requirements of the regional freight task are evolving, as is the socio-economic environment in which the industry operates. It is important that the region's road infrastructure and logistics capability develops and adapts to suit the needs of Hub's nationally significant concentration of industry as well as the changing expectations of local communities, other road users and state and national policy makers.

Road infrastructure

General

The project has identified 27 specific road infrastructure issues across seven local government areas within the region. For 18 of those issues, the project has identified infrastructure upgrade or construction solutions at an estimated capital expenditure of $118.825 million, including $32.3 million for the Jingellic Rd upgrade which is already the subject of a detailed business case (refer to Table 11). The other 12 are considered "Observe" only at this point.

Table 11: Summary of estimated road improvement expenditure by local government area

	Local Government Authority							
Priority ranking	**Alpine**	**Cootamundra -Gundagai**	**Greater Hume**	**Indigo**	**Snowy Valleys**	**Strathbogie/ Benalla**	**Wagga Wagga City**	**Total**
Observe		$20,000,000						$20,000,000
Low					$3,625,000	$5,625,000		$9,250,000
Medium							$1,000,000	$1,000,000
High					$2,400,000			$2,400,000
Very High			$1,000,000		$73,800,000			$74,800,000
Urgent			$1,000,000		$10,375,000			$11,375,000
Total	**$-**	**$20,000,000**	**$2,000,000**	**$-**	**$90,200,000**	**$5,625,000**	**$1,000,000**	**$118,825,000**

Tumbarumba

Through the consultation process it was identified there is a pressing need to address limitations of the road network surrounding Tumbarumba within the Snowy Valleys Shire. Issues include:

- Increased interactions between forest and wood products freight (logs and manufactured goods) and other road users, especially tourism traffic.

- Bottlenecks (e.g., narrow bridges and limited overtaking) and limitations (e.g., bridge weight limits and pavement quality), particularly on the Batlow, Tooma and Wagga-Tumbarumba Roads.
- The absence of alternative routes to Tumbarumba for HPVs.

The estimated capital expenditure for deliver road network improvements around Tumbarumba is $90 million, which represents almost 76% of the total estimate for the region. Those improvements include addressing safety issues between Tumbarumba and the Hume Highway to cater for the significant raw log and manufactured product movements both ways, while catering for the increasing tourism and industrial traffic and other road users. In particular, a majority of stakeholders indicated there is a clear need for a better solution for log transport into Tumbarumba from the north which bypasses the main street, with the most logical solution considered to be an upgrade to Courabyra Rd.

Logistics capability

Reducing interactions between road users

It is important to understand and manage the interface between the forest and wood products sector and increased traffic from other road uses in the region. Less vehicle movements on a more efficient network and the increased use of HPV combinations would support a more positive outcome for all road users. In that context, consideration of HPVs is critical. The analysis presented in this report shows that even a moderate increase in the use of A-doubles for log transport for 35% of the haulage task would reduce truck movements by 14%, or 11,000 movements per year. That represents a significant reduction in potential interactions between log trucks and other road users. It is likely that most of the public road network and a significant proportion of the in-forest road network can support A-doubles, although more work is required to accurately quantify this.

Improved haulage efficiency

Continued focus on the role of HPVs, particularly for the log haulage task, offers significant potential benefit with respect to fuel efficiency, reduced emissions and reduced truck movements. There are also benefits to be achieved for other elements of the forest products freight task but changes for manufactured products are more difficult to test because of destination limitations.

Based on industry intelligence, it is estimated that 95% of the current log haulage task is undertaken on B-doubles and the remaining 5% us undertaken with semi-trailers (singles). There is a desire among some industry players to move a proportion of the haulage task to A-doubles. The complete removal of singles from the regional haulage fleet is impractical because of in-forest limitations to larger and longer trailer configurations. Similarly, for a range of reasons it is unlikely that a full move from A-doubles to B-doubles can be achieved, at least in the short to medium term. However, there is a compelling argument to transition some proportion of the B-double fleet to A-doubles, especially where the in-forest limitations to longer trailers can be overcome, customer facilities are capable of handling the longer loads and for longer hauls, such as logs being transported from the Bombala region.

Figure 13 compares the average annual truck movements (#) and fuel use (l)[7] for the 5.7 million tonne annual total haulage task. It presents data for each of the four scenarios explored in this report. It also presents, for comparative purposes, a hypothetical 100% application of each of the three trailer configurations. The graph demonstrates the significant changes that have already occurred over the past two decades with the move from 100% singles to the current state (Baseline scenario). It also clearly demonstrates, as discussed earlier

[7] Fuel use and emissions follow the same pattern of proportional change

in the report, the further substantial reductions in truck movements, fuel use (and by extension emissions) that can be achieved with even moderate increases in the proportion of A-doubles in the fleet configuration.

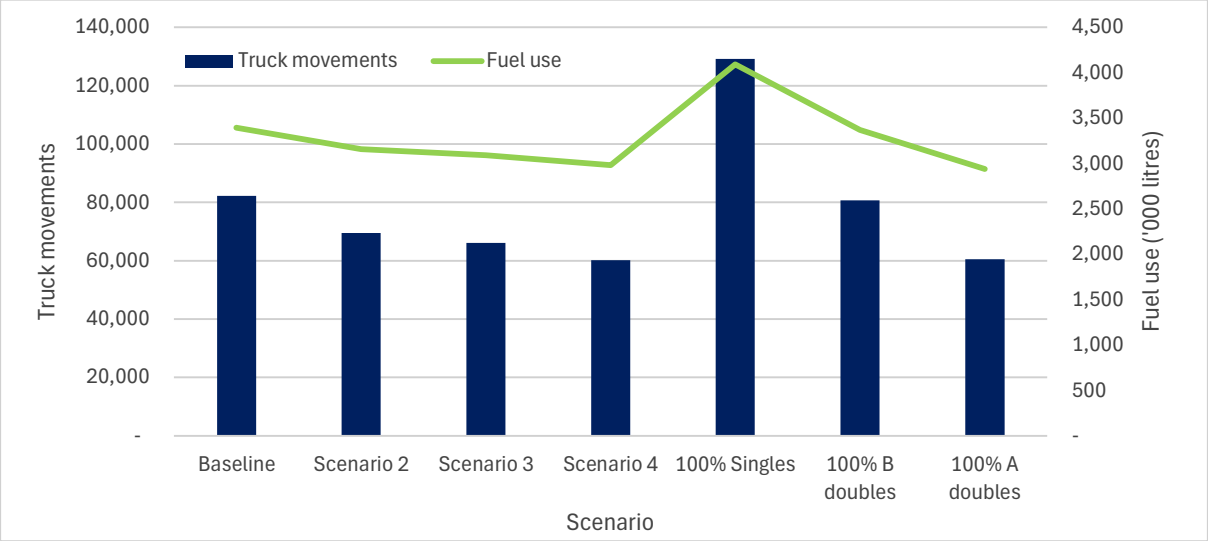

Figure 13: Comparison of annual average log truck movements and fuel use for various scenarios

Opportunities for further work

The results of the infrastructure needs and optimisation assessment have highlighted several opportunities for additional work that the Hub and stakeholder organisations might consider.

Infrastructure upgrade projects

Urgent infrastructure upgrades

There are six urgent projects identified for the Batlow and Wagga-Tumbarumba Roads (Issues 4.1, 4.3, 4.4 5.1, 5.2 and 5.3 in Table 6Table 5). They include two bridge upgrades (Glenroy and Jacksons Bridges on the Wagga-Tumbarumba Road), pavement quality issues around the Coppabella Road intersection to the Wagga-Tumbarumba Road, and the installation of overtaking lanes in three sections of Batlow Road. There is an opportunity for the Hub to support the Softwoods Working Group and relevant local government authorities to develop business cases to facilitate infrastructure upgrades.

Tumbarumba bypass feasibility study

The mooted upgrade of Courabyra Road to facilitate a bypass for the township of Tumbarumba is a project that is potentially as significant as the upgrade to Gocup Road. The immediate opportunity for the Hub is to undertake work with other stakeholders, including the Softwoods Working Group, NSW state government and Snowy Valleys Shire Council, to commission a detailed feasibility study for the potential bypass.

Warrenbayne Road alternative route

The Warrenbayne Road alternative route proposal warrants the development of a business case to assess the benefits of the shortened route to the Midland Highway against the road upgrade costs.

Logistics efficiency projects

The Hub has commissioned an extension to this project to design an A-double trial for log haulage which is currently underway. That project is likely to identify opportunities for additional work, including implementation of a trial.

Information availability

The project has produced a considerable amount of data which is presented in pdf map format. There is an opportunity to undertake a project to develop an online spatial database that can be used by Hub members and other stakeholders to drill into detail for specific road segments and allow information to be presented at different scales to suit a range of uses. This would also allow for regular and cost-effective data updates.

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