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Gunns Ltd

Bell Bay Pulp Mill Project

Expert Witness Statement - Keith Midson

January 2007

INFRASTRUCTURE | MINING & INDUSTRY | DEFENCE | PROPERTY & BUILDINGS | ENVIRONMENT

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1. Introduction

Expert Witness Statement of Keith Midson
Expert of Gunns Limited

In the matter of the Bell Bay Pulp Mill Project: A project of State Significance
Resource Planning and Development Commission Inquiry

1.1 Name and Address

Keith Midson

GHD Pty Ltd
162 Macquarie Street
Hobart TAS 7000

1.2 Area of Expertise

My area of expertise is Traffic Engineering and Transport Planning.

My qualifications and professional experience are detailed in Appendix A.

I am sufficiently expert to make this statement because I have eleven years experience in traffic engineering and transport planning, I have two masters degrees in the fields of traffic and transport, and I have undertaken a substantial number of traffic impact assessments and transport studies throughout my professional career.

2. Scope

2.1 Introduction

The Transport Impact Assessment (TIA) was exhibited in Volume 15, Appendix 43 of the Draft Integrated Impact Statement (Draft IIS) on the proposed Bell Bay Pulp Mill. I adopt the TIA as the basis for this expert witness statement and evidence, except where this statement adds to or qualifies matters contained in the TIA.

2.2 Instructions

I was engaged by Gunns as part of a project team that prepared a large portion of the Draft IIS. I was engaged on the basis of my experience as a traffic engineer and transport planner, having worked on a number of traffic impact assessments, transportation studies and other relevant projects.

Following exhibition of the Draft IIS I have undertaken additional transport analysis to clarify aspects of the TIA in response to submissions on:

- ***Transport of chemicals to the pulp mill.*** This statement provides an assessment of the revised transport of chemicals to the site, including the analysis of unladen truck trips.
- ***Review of traffic impacts associated with the proposed workers accommodation facility in George Town.*** The traffic impact assessment for the workers accommodation facility was undertaken by Pitt and Sherry in the Draft IIS. This statement provides an opinion on the traffic impacts of this facility.
- ***Review of traffic impacts of proposed landfill and quarry facilities.*** The traffic impact assessment for the proposed landfill and quarry facilities was undertaken by Pitt and Sherry in the Draft IIS. This statement provides an opinion on the traffic impacts associated with these facilities.
- ***Review of traffic impacts of proposed pipeline construction.*** The traffic impact assessment for the construction of the water supply pipeline and effluent pipeline was undertaken by Pitt and Sherry in the Draft IIS. This statement provides an opinion on the traffic impacts associated with this facility.
- ***Review of road safety implications of pulp mill.*** Additional analysis has been undertaken in this statement on road safety implications associated with any increase or decrease in log truck volumes, taking into consideration Mainland Australia experience with articulated trucks.
- ***Review of potential pavement damage and maintenance implications for pulp mill.*** This statement provides a general review of potential impacts on pavement damage as a result of increased truck movements on East Tamar Highway.
- ***Review of various transport routes and townships highlighted in submissions.*** Several road corridors and townships were highlighted as being of concern in submissions to the Draft IIS. Clarification of the impacts associated with traffic generated by the pulp mill on these road corridors and townships has been provided in this statement.
- ***Unladen log truck, chemical and boiler fuel vehicle trips.*** An assessment of the unladen trips associated with log trucks and other deliverables has been undertaken in this statement.

» ***Review comments received by consultants Beca AMEC.*** An assessment was undertaken of the review of the TIA by consultants appointed on behalf of the Tribunal.

The findings of this additional analysis and response to submissions are contained in Section 4 of this statement.

2.3 Methodology of Draft IIS TIA

The assessment of the transport impact assessment of the proposed northern Tasmania pulp mill required the analysis of timber resource supply information and the application of operational strategies for the transport of timber to pulp mill and existing chip mills, over a defined timeframe.

Gunns supplied timber resource data for 35 catchment regions throughout the State. The catchment areas are shown in Figure 1. The details of the catchment areas can be found in the TIA of the Draft IIS, specifically in Table 2 of Volume 15, Appendix 43 of the Draft IIS. Each of the catchment zones contains timber resources that vary over time. Gunns have estimated the quantities that will be utilised for the proposed pulp mill and their existing wood chip mills over three defined timeframes. Resources from these regions are allocated to the wood chip mills and pulp mill, and their transport was dependent on a set of strategies both with and without the use of the rail network. The transport cartage rules for modelling of the transport of timber resources can be found in Appendix B of the TIA. The cartage rules define where timber resources are to be transported to, as well as the method of transport for each Strategy.

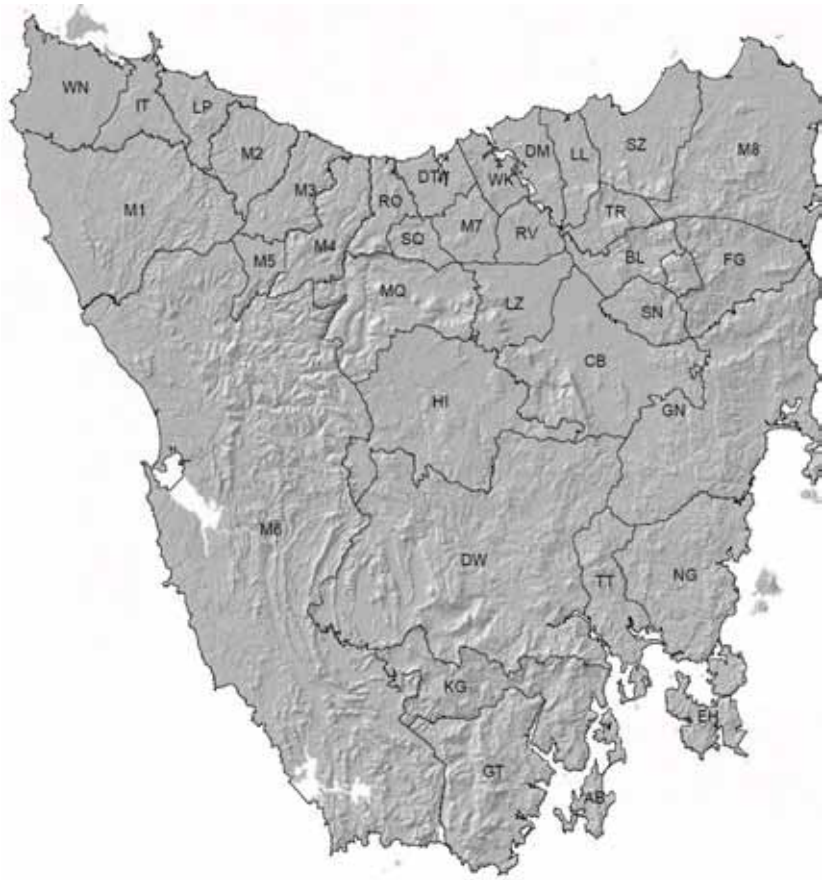

Figure 1 Resource Catchment Zones

As outlined in the TIA of the Draft IIS, three timeframes were considered to analyse the transport impacts of the proposed Pulp Mill:

» ***Startup*.** This model is based on forecast wood supply data provided by Gunns projecting truck generation rates and truck routes on major Tasmanian roads in 2008 and 2009;

» ***Snapshot 1***. This model is based on forecast wood supply data provided by Gunns projecting future truck generation rates and truck routes on major Tasmanian roads in 2013, 2014 and 2015; and

» ***Snapshot 2.*** This model is based on forecast wood supply data provided by Gunns projecting truck generation rates and truck routes on major Tasmanian roads in 2019, 2020 and 2021.

Two or three years have been averaged for each timeframe due to the variation of wood resources from year to year.

For each of these timeframes, three different operational strategies have been analysed based upon modelled timber resource. These operational strategies are broadly outlined as follows:

» ***Control Strategy*.** This strategy models wood flow around the State if the proposed pulp mill does not proceed. It reflects future transport movements based on the current Gunns woodchip export business within Tasmania (this is the future base scenario as a benchmark for comparison of pulp mill strategies across various timeframes);

» ***Anticipated Strategy.*** This strategy models wood flow around the State when the proposed pulp mill utilises a combination of native and plantation wood to improve economic viability of the proposed pulp mill and to reduce road based timber freight across the State. The Anticipated Strategy represents Gunns preferred resource strategy for the operation of the proposed pulp mill as described in Section 4.2.6.3 - Pulpwood Supply; and

» ***Plantation Strategy.*** This strategy utilises predominantly plantation wood (as the plantation resource matures and becomes available for harvesting in Tasmania) for the operation of the proposed pulp mill and a combination of native and plantation wood to the existing chip mills as described in Section 4.2.6.3 – Pulpwood Supply.

Conceptually, these three strategies are shown in Figure 2.

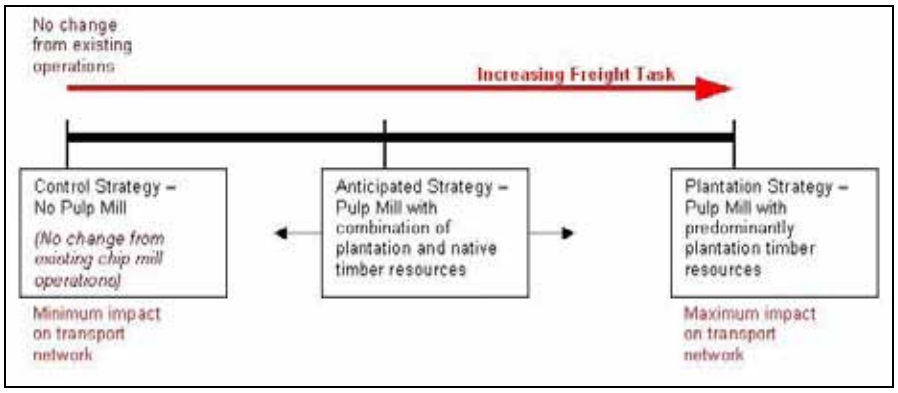

Figure 2 Resource Strategies

Figure 2 indicates the general variation in freight task between the three operational strategies. The Control Strategy has the minimum impact on the road and rail transport systems as it represents the existing operational strategy for Gunns woodchip mills. The Control Strategy only sources timber resources from within each region that the respective chip mills are situated; therefore no resources are transported across region boundaries. All of these strategies are modelled with and without the use of the rail network.

The application of these strategies over the defined timeframes results in 15 modelled scenarios, as shown in Table 1.

Table 1 Transport Modelling Summary

	Start Up: 2008/09	Snapshot 1: 2013-15	Snapshot 2: 2019-21
Control Strategy	No Pulp Mill – existing operation of Gunns three chip mills	No Pulp Mill – existing operation of Gunns three chip mills	No Pulp Mill – existing operation of Gunns three chip mills
Anticipated Strategy – Rail	Plantation/ native wood Pulp Mill – utilisation of rail infrastructure for some long haul timber resources	Plantation/ native wood Pulp Mill – utilisation of rail infrastructure for some long haul timber resources	Plantation/ native wood Pulp Mill – utilisation of rail infrastructure for some long haul timber resources
Anticipated Strategy – No Rail	Plantation/ native wood Pulp Mill – utilisation of road infrastructure for all timber resources	Plantation/ native wood Pulp Mill – utilisation of road infrastructure for all timber resources	Plantation/ native wood Pulp Mill – utilisation of road infrastructure for all timber resources
Plantation Strategy – Rail	Plantation wood Pulp Mill – utilisation of rail infrastructure for some long haul timber resources	Plantation wood Pulp Mill – utilisation of rail infrastructure for some long haul timber resources	Plantation wood Pulp Mill – utilisation of rail infrastructure for some long haul timber resources
Plantation Strategy – No Rail	Plantation wood Pulp Mill – utilisation of road infrastructure for all timber resources	Plantation wood Pulp Mill – utilisation of road infrastructure for all timber resources	Plantation wood Pulp Mill – utilisation of road infrastructure for all timber resources

The application of these strategies provides resource movement information that can be translated into truck and rail movements.

Gunns supplied weighbridge data for log truck arrivals at the existing Long Reach wood chip mill. This data was used to calculate the average log truck loading and was applied to the resource data to determine log truck movements.

Information regarding light vehicle movements associated with the operation of the pulp mill were sourced from Gunns. This information related to general staff and service vehicles.

Information regarding delivery of chemicals used in the operation of the pulp mill was sourced from Jaakko Poyry. This information included road and sea freight of various chemicals to the pulp mill.

Another deliverable to the pulp mill was boiler fuel sourced from various sawmills in the northeast region. This boiler fuel allocation and truck volume information was sourced from Gunns for this task.

The above transport tasks were analysed in terms of laden truck movements to the pulp mill site on the East Tamar Highway corridor. Log truck movements were analysed in terms of vehicles kilometres travelled (representing the freight task associated with the transport of the timber resource to the chip mills and pulp mill), as well as laden truck volumes on key State and local government roads.

Road safety was investigated in the context of heavy vehicles for the Tasmanian road network. Five years of crash data was sourced from DIER for log trucks and high productivity vehicles (bdoubles), as well as seven years of crash data for log trucks, and 19 years of articulated truck crash data to determine any specific trends.

The construction phase of the pulp mill was also investigated. This involved the analysis of construction manpower supplied by Jaakko Poyry. This was converted into vehicle movements in conjunction with the

ongoing operation of the Long Reach woodchip mills. The movements at the Gunns access to the East Tamar Highway was investigated using aaSIDRA intersection analysis software to determine whether any modifications would be required at this junction as a result of increased traffic movements.

3. Summary of TIA

This witness statement is intended to be referenced in conjunction with the TIA.

The TIA reached a number of conclusions as follows:

- There will be a relatively high traffic generation associated with the construction phase of the pulp mill. The East Tamar Highway can accommodate this traffic generation with some minor alterations to the mill's access road and other potential traffic management measures.
- The worst case scenario of the Plantation Strategy in conjunction without the utilisation of rail will result in some large increases in log truck volumes that may require mitigation measures on some identified routes.
- The preferred scenario of the Anticipated Strategy in conjunction with the use of rail results in a net decrease of log truck volumes and distance travelled on Tasmania's roads.
- There will be an increase in log truck movements associated with the ongoing operation of the existing wood chip mill if the pulp mill does not proceed.
- The pulp mill was supported on traffic and transport grounds.

4. Additional Analysis

4.1 Introduction

As previously mentioned, the TIA of the Draft IIS has been adopted. This section provides the detail of the additional work since the publication of the Draft IIS, which is summarised below.

I was requested by Gunns to investigate several matters associated with the Draft IIS. These include the traffic and transport impacts associated with:

- A comprehensive review of the TIA of the Draft IIS;
- Landfill Development;
- Workers Accommodation Facility;
- Pipeline construction;
- Transport of Chemicals; and
- Return Vehicle Trips.

The findings of additional investigations into these matters are detailed in the following sections.

4.2 Transport Impact Assessment Review

In reviewing the TIA, it appears that some clarification of figures was required and inconsistencies between the TIA and other sections of the Draft IIS resolved. These are summarised in Table 2.

Table 2 Transport Impact Assessment and Draft IIS

Location in Draft IIS	Description of Revision	Implications
Table 13, page 63 and Figure 16 on page 64 of Appendix 43	Chemical delivery information describes caustic soda as being shipped to Hobart and transported by road to pulp mill. No information of truck volumes is provided in this table. Caustic soda is not being delivered to Hobart, but direct to the pulp mill berth. This removes any caustic soda transport from Midland Highway and Launceston corridor.	Transport direct to the pulp mill berth has safety benefits as it removes the risk associated with transport of dangerous goods on the road network.
Table 14, page 69 of Appendix 43 Figure 18, page 75 of Appendix 43 Figure 21, page 78 of Appendix 43	Table 14 indicates that a total of 78 trucks per day will transport boiler residue to pulp mill. This is not consistent with Figures 18 and 21 which indicate that 67 trucks per day will undertake this task. Table 14 of the TIA provides the correct total. Truck volumes relate to laden truck trips. Analysis of unladen trips are contained in this expert witness statement.	This discrepancy does not alter the findings of the report.
General	Only considers truck volumes entering the pulp mill, not	Laden trucks (specifically log trucks)

Location in Draft IIS	Description of Revision	Implications
	unladen log trucks/ chemical transport trucks/ unladen boiler fuel trucks existing the pulp mill.	have greater impacts on pavements, road safety and community perceptions, therefore more emphasis was placed on these vehicles. Truck volumes relate to laden truck trips. Analysis of unladen trips are contained in this expert witness statement.
Appendix 43, Section 6.4, Table 15	Incorrect total truck volume figures in last two cells of table.	Incorrect figures were not translated to other components of Draft IIS.
Volume 2, 2.12.5 and Appendix 43, Section 2.3, page 19	Draft IIS states that "Gunns currently operate four woodchip mills in Tasmania from three sites" compared to "Gunns currently operate three woodchip mills in Tasmania" in Transport report.	None. Two chip mills operate at the Tamar site.
Volume 2, Table 26 and Appendix 43, Section 3.4, Table 9	Draft IIS refers to an older version of Table 9 from Transport Report. Latest version has more updated traffic data.	None.

4.3 Landfill Development

A detailed description of the landfill, its proposed location and potential operational transport and traffic impacts on the surrounding road network can be sourced from the Draft IIS Volume 2B, *Bell Bay Site*. This component of the Draft IIS was prepared by Pitt and Sherry Consultants contained in Appendix 55, Volume 16.

Access to the proposed landfill/ quarry/ water reservoir site is located approximately 1.4km north of the existing woodchip plant access. The access location was assessed on the basis of available sight distance for the posted speed limit.

The sight distance was measured in accordance with the criteria contained in the Austroads Guide to Intersections at Grade and was found to be compliant and with the addition of some minor vegetation clearing could be extended. Site investigations of this proposed access location confirm that the available sight distance meets relevant AustRoads guidelines[1].

The anticipated operational truck volumes were considered for the landfill/ quarry/ water reservoir site access, and it was found that with all operational traffic associated with these sites, if 50% of all associated movements occurred within one hour, the peak hourly movements equates to 5 trips per hour in and out of the site.

[1] AustRoads, Guide to Traffic Engineering Practice, Part 5 – Intersections at Grade, 2005.

Due to the low turning movements associated with this volume of traffic, no intersection widening works are required by strict interpretation of the AustRoads guidelines. However the primary turning traffic will be relatively slow moving trucks, therefore it was considered in the Pitt and Sherry report that the intersection be upgraded to the Type B standard to prevent lowering the performance of the intersection where northbound traffic are required to pass a right turning truck on the gravel shoulder.

It is considered that the new intersection may vary slightly from the existing access location, provided that the sight distances are maintained. The access road will be constructed to meet Class 2 ("Significant Feeder Road") standards under the Forest Practices Code 2000.

It is in my opinion that the analysis of the traffic and transport impacts in relation to the proposed landfill outlined in the Draft IIS are acceptable.

4.4 Pipeline Construction

Detailed descriptions of the water supply pipeline and the effluent pipeline can be sourced from the Draft IIS Volumes 3A and 3B. The sections detail the potential transport and traffic impacts from their construction and outlines the effluent pipelines proposed alignment.

Effluent Pipeline

The effluent pipeline follows or intersects the East Tamar Highway and numerous Council owned roads up to Four Mile Beach and crosses the railway line near the intersection of East Tamar Highway and Bridport Road. The following George Town Council roads are anticipated to intersect the effluent pipeline:

- Bell Bay Road;
- Main Road;
- Mount George Road;
- William Street;
- Dorset Street;
- Cemetery Road;
- George Street;
- Davies Street;
- Stonehouse Street;
- Arnold Street;
- Soldiers Settlement Road;
- Aerodrome Road;
- East Beach Road; and
- Bellbuoy Beach Road.

Short-term traffic impacts are likely to be expected on the above roads affected by the effluent pipeline construction. It is anticipated that the construction of the effluent pipeline is likely to generate minimal additional traffic on the surrounding road network and the effects of the construction will be localised.

The impacts associated with the construction phase may include a small number of additional vehicles (both trucks and construction equipment), temporary road closures and access restrictions.

The traffic management necessary to minimise the disturbance from this construction will be unique for each individual location, so it is therefore required that a Traffic Management Plan be prepared before construction commences in accordance with DIER codes of practice and Australian Standards, AS 1742.3, Manual of Uniform Traffic Control Devices, Part 3, *Traffic Control Devices for Works on Roads*, 2002 to ensure disturbances are kept to a minimum.

Water Supply Pipeline

Details of the alignment of the water supply pipeline can be seen in the Draft IIS, Volume 3A, however it is proposed to be located between Launceston City and Bell Bay, and will generally follow the alignment of the East Tamar Highway. It is anticipated that the pipeline will cross numerous roads as well as the East Tamar Highway generating short-term localised disturbances to the road network. The impacts associated with the construction phase may include a small number of additional vehicles (both trucks and construction equipment), temporary road closures and access restrictions.

The traffic management necessary to minimise the disturbance from this construction will be unique for each separate location, so it is therefore required that a Traffic Management Plan be prepared before construction commences in accordance with DIER codes of practice and Australian Standards, AS 1742.3, Manual of Uniform Traffic Control Devices, Part 3, *Traffic Control Devices for Works on Roads*, 2002 to ensure disturbances are kept to a minimum.

Where possible, construction should utilise partial road closures with appropriate traffic control, or works during non-peak times to minimise disruption to traffic on busy roads.

It is in my opinion that with the above mentioned mitigation measures; the impact on the surrounding road network should be minimal and remain localised to the immediate area of construction of both the water supply pipeline and the effluent pipeline.

4.5 Workers Accommodation Facility

Pitt and Sherry prepared TIA for the proposed workers accommodation facility situated at Pembroke Street, George Town. The accommodation facility is proposed to house up to 800 workers during the construction phase of the pulp mill. The Pitt and Sherry report is provided in Appendix 37 contained in Volume 14 of the Draft IIS.

The Pitt and Sherry report concluded that, from a traffic perspective, the facility would function adequately with some specific recommendations for the access and internal road network arrangements.

The Transport Impact Assessment referenced the Pitt and Sherry report in Section 4.2 of Appendix 43. In addition to this, the Transport Impact Assessment used construction manpower estimates to determine the transport implications between the pulp mill site and the proposed accommodation facility.

Due to the specific nature of the proposed accommodation facility, I do not agree with the traffic generation rates provided in the Pitt and Sherry report. In my opinion, the traffic generation rates provided in the Pitt and Sherry report, which reference the Roads Traffic Authority of NSW for motel/ casual accommodation, are overly simplistic and are not relevant to the proposed facility. The traffic generation rates used in the Pitt and Sherry report do not reference the use of bus transport to the pulp

mill construction site, and do no not reference the potential for workers sharing private motor vehicle transport.

Based on the transportation requirements for construction workers to and from the pulp mill site, and various other trip requirements for these workers, a more appropriate traffic generation for this site is provided in Table 3. The traffic generation rates provided in this table relate to the peak construction period, when the number of workers on-site are maximised.

Table 3 Proposed Workers Accommodation Facility Traffic Generation

Trip Purpose	Daily Traffic Generation	Peak Hour Traffic Generation	Comment
Transport to and from pulp mill construction site	512 vehicles per day 24 buses per day	171 vehicles per hour 8 buses per hour	Based on provision of 4 bus deliveries each way per shift (40 workers per bus), and vehicles carrying average of 2.5 workers per vehicle. Peak hour refers to shift work – three times per day.
General trips, not related to the pulp mill site	640 vehicles per day	64 vehicles per hour	Based on assumption that there will be one trip per person each day (return trip) not associated with the pulp mill, and vehicles carrying average of 2.5 people per vehicle. Peak hour assumed to be 10% of daily trips – this is considered to be an over-estimation, as these trips are not associated with commuting.
Service trips	10 per day	1 vehicle per hour	Assumed
Total trips	**1,186 vehicles per day (1,200 vpd)**	**244 vehicles per hour**	

This traffic generation is substantially less than Pitt and Sherry's estimate of 2,400 vehicles per day and 320 trips per peak hour.

It should be further noted that the traffic generation figures provided in Table 3 are considered to be an over-estimation due to the following reasons:

» The facility will cater for 800 workers at any one time. The facility may not be at capacity at all times, therefore there is likely to be a reduced number of workers travelling to and from the pulp mill construction site.

» The estimation of 1 return trip per person each day that is not associated with the pulp mill may be an over-estimation of trip generation, as many workers will walk to services and facilities within George Town, and some workers may only require external trips by vehicle on a less regular basis (perhaps once or twice per week).

» The use of buses has been proposed to transport workers between the accommodation facility and the pulp mill, this will reduce the dependence of many of the workers on private motor vehicle transport.

The shiftwork nature of the workers may result in the peak traffic generation associated with the workers accommodation facility to approximately 10% of the daily generation. This equates to approximately 120

vehicles per hour. In my opinion, this peak traffic volume can be accommodated in George Town's road network.

It should be noted that traffic generation can be further reduced from the workers accommodation facility through the use of additional buses during peak times.

Whilst the revised traffic generation of the workers accommodation facility are substantially less than the Pitt and Sherry report, it should be noted that their calculations of 2,400 vehicles per day and 320 trips per peak hour can be adequately supported by George Town's road network without significant adverse impacts on capacity or road safety, as concluded in the Pitt and Sherry report.

4.6 Unladen Vehicle Trips

The TIA of the Draft IIS analysed the origin-destination of laden log trucks on Tasmania's road network. The Draft IIS considered laden trucks only for the following reasons:

- It provides valuable information on the movement of timber resources throughout the State;
- Laden log trucks cause substantially more damage to road infrastructure;
- They potentially have a higher risk or crash involvement due to their increased stopping distances and physical weight of vehicle compared to an unladen truck;
- Have a greater impact on road capacity due to their size and reduced acceleration rates; and
- There is uncertainty of their destination patterns for unladen log truck trips. Unladen log trucks do not necessarily return to the wood supply catchment of their laden trip origin. Unladen trucks may return to their place or residence or another alternative location.

It is typical for the analysis of the movement of resources between locations to consider the movement of laden vehicles only. An example of a similar freight analysis undertaken by DIER is the Forestry Freight modelling (originally for the Northeast region of Tasmania, then for whole of State), where timber resources have been modelled as laden trips between resource zones and destinations using TransCAD modelling software. The purpose of the DIER study was to have an understanding of the movement of timber resources between zones. The movement of unladen trucks was not considered in this study.

In the context of submissions received, this report considers the movements of unladen log trucks, and is complimentary to the analysis undertaken in the TIA of the Draft IIS. For the purpose of this report, unladen log trucks have been assumed to return to their wood supply catchment area for the following reasons:

- Provides a simplistic and consistent modelling scenario that accounts for unladen trucks entering each timber resource zone.
- The absence of origin-destination information regarding truck movements post-delivery of timber resources to pulp mill (or chip mills) means that accurate truck volumes on individual road networks are difficult to determine.

All unladen log truck movements have been compared to the Control Strategy. In this manner whilst the total truck movements investigated have essentially doubled compared to laden only, in percentage terms there is no change.

Considering laden and unladen movements, the total operational traffic associated with the proposed Pulp Mill on selected Tasmanian roads has been assessed and the volumes are shown in the following

figures and tables for both the rail and no-rail scenarios. Essentially, the total heavy vehicle volumes double for each road being investigated, although the ratios between scenarios and timeframes remains constant.

4.6.1 Rail Scenario

The graphs shown in Figure 3, Figure 4, Figure 5, Figure 6, and Figure 7 indicate the number of laden log trucks on sections of the East Tamar Highway, Midland Highway, Bass Highway, Tasman Highway and pulp mill access road respectively for the rail scenario. These Figures also indicate the unladen truck movements for log trucks, chemical transport trucks and boiler residue trucks.

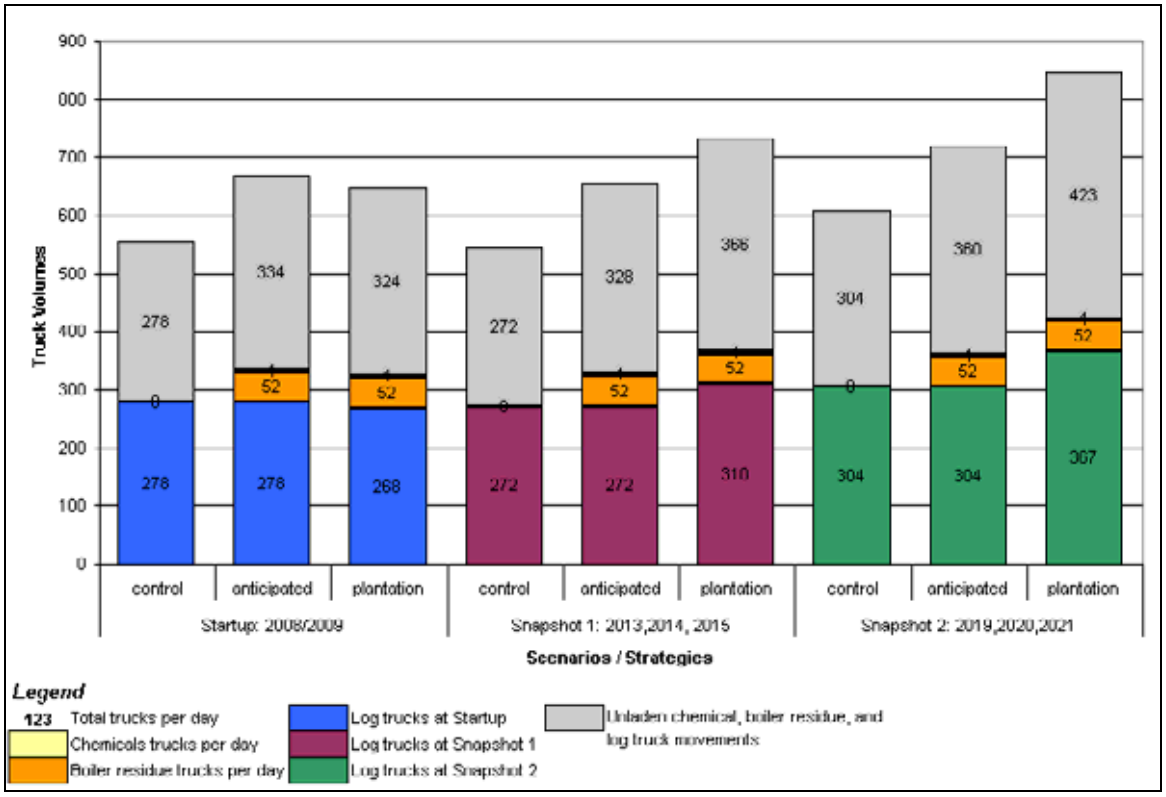

Figure 3 East Tamar Highway Between Longreach Mill Access and Batman Highway, Rail Scenario

It can be seen from Figure 3 that the truck volume characteristics are similar to the laden only graphs contained in the TIA of the Draft IIS. There is little change in operational truck volumes on the East Tamar Highway, south of the mill access and north of Batman Highway, between Startup and Snapshot 1 under the rail scenario. There is a moderate increase in truck volumes under Snapshot 2.

The transport of chemicals and boiler residue will be greater on the East Tamar Highway than any other major road since the East Tamar Highway provides the sole vehicular access to the proposed pulp mill site. It can be seen however from Figure 3 that the transport of chemicals represents a small proportion of overall truck movements on this section of highway.

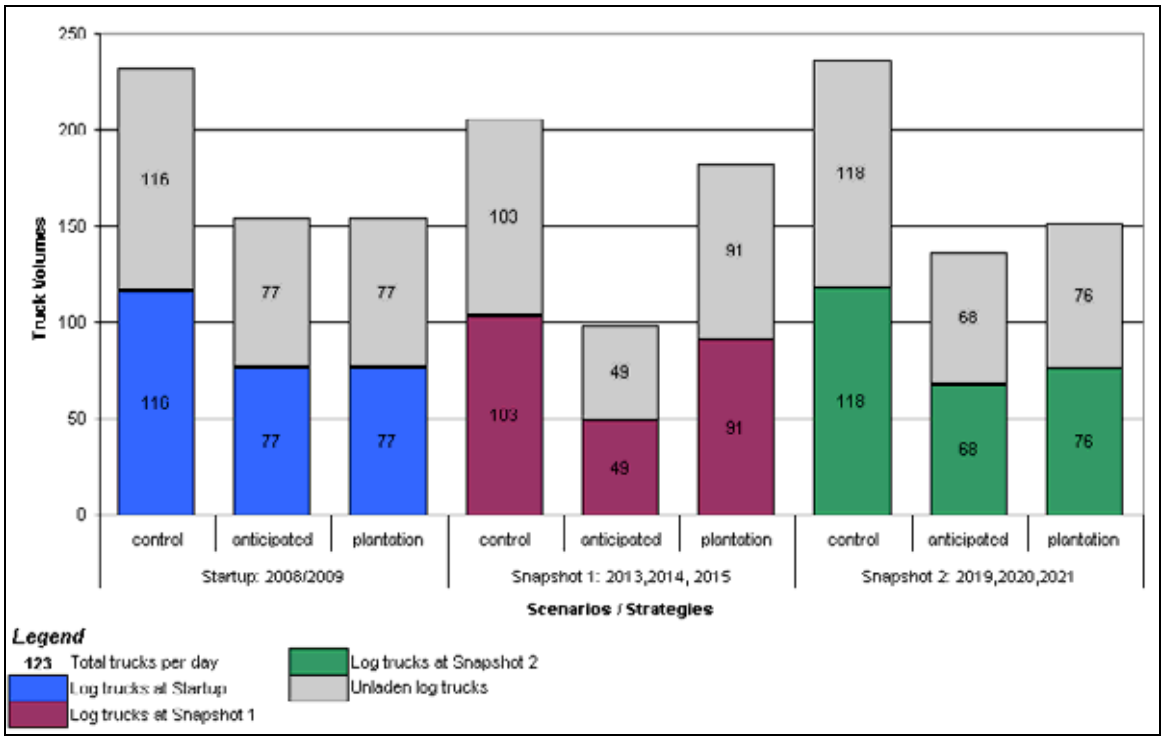

Figure 4 Midland Highway, North of Bridgewater, Rail Scenario

Figure 4 shows general decrease in log truck movements on this section of Midland Highway for both Anticipated and Plantation Strategies compared to the Control Strategy when utilising rail. The inclusion of the unladen log truck movements provides a larger decrease in log truck volumes when compared to the laden only graphs provided in the TIA of the Draft IIS.

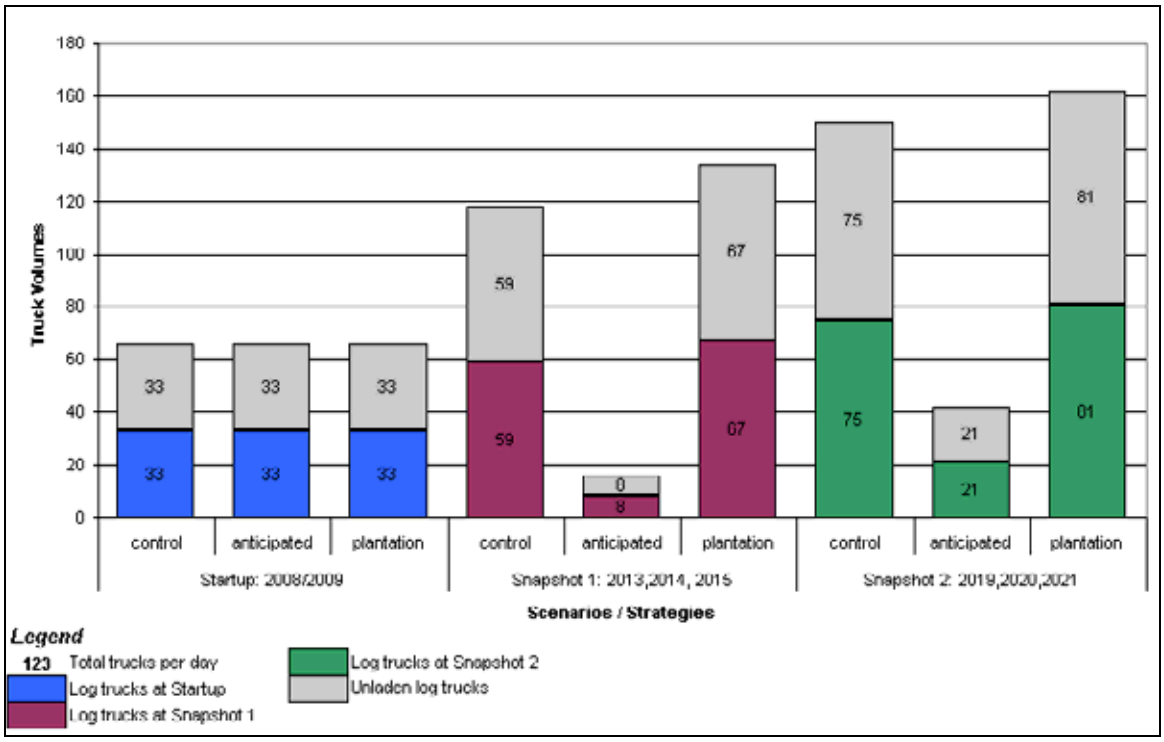

Figure 5 Bass Highway, East of Murchison Highway, Rail Scenario

Figure 5 shows a strong difference between standard and plantation strategies in Snapshots 1 and 2 for rail scenario on this section of the Bass Highway. A large decrease in log truck volumes is displayed using the Anticipated Strategy compared to the Control Strategy.

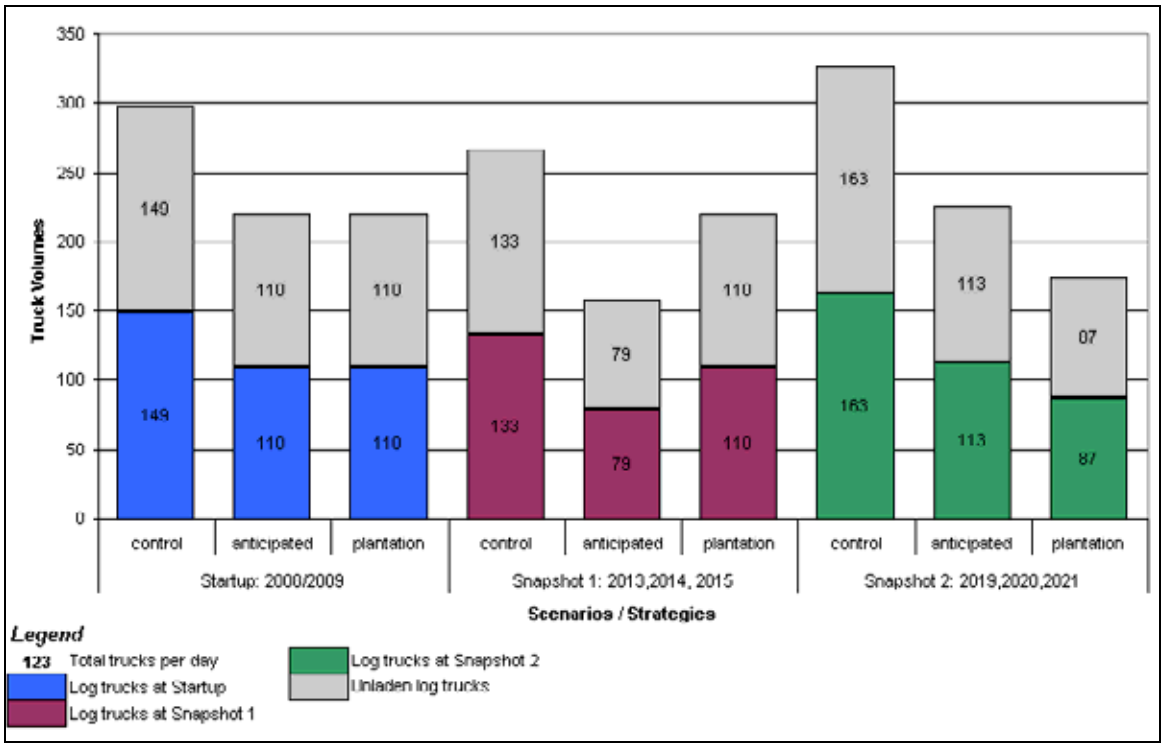

Figure 6 Tasman Highway, Near Orford, Rail Scenario

Figure 6 shows a general decrease in log truck volumes for both Anticipated and Plantation Strategies compared to the Control Strategy for Tasman Highway near Orford when utilising rail. The inclusion of the unladen log truck movements provides a larger decrease in log truck volumes when compared to the laden only graphs provided in the TIA of the Draft IIS.

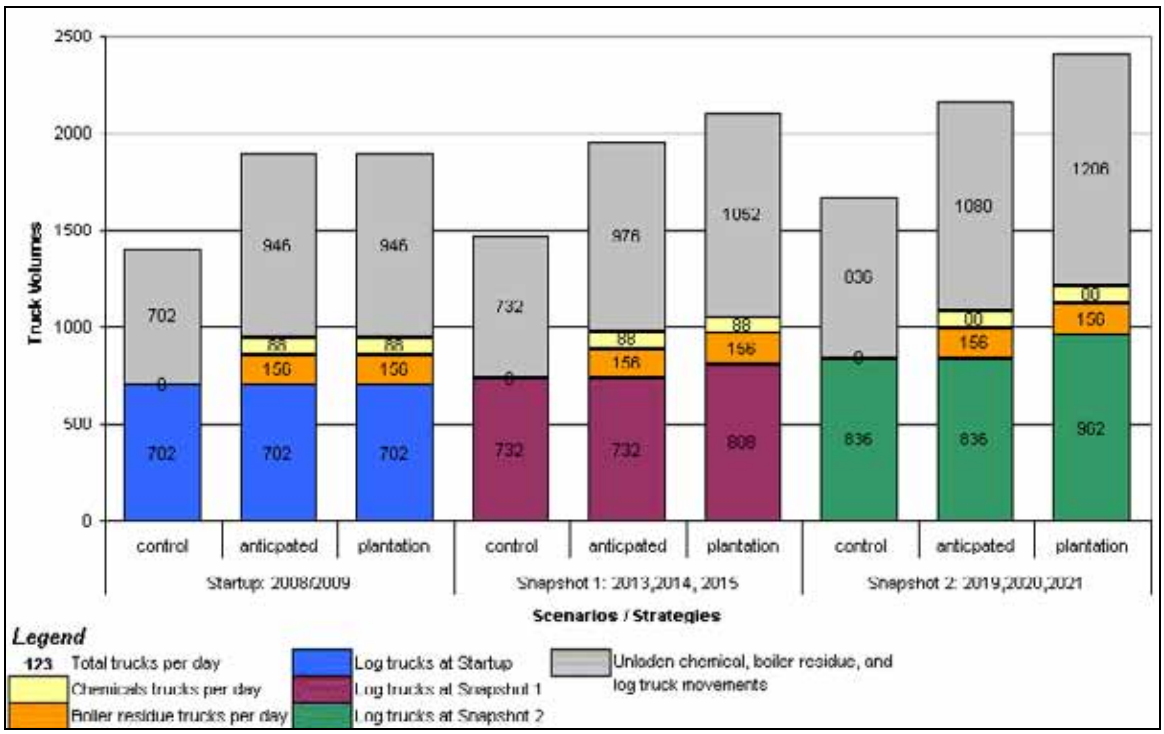

Figure 7 Pulp Mill Access Road, Rail Scenario

A large increase in truck volumes is shown in Figure 7 for the pulp mill access road for Anticipated and Plantation Strategies compared to the Control Strategy in all timeframes. Much of this increase is associated with the transport of chemicals and boiler fuel that is not required for the operation of the existing chip mills at the site.

4.6.2 No Rail Scenario

The graphs shown in Figure 8, Figure 9, Figure 10, Figure 11 and Figure 12 indicate the number of trucks on sections of the East Tamar Highway, Midland Highway, Bass Highway, Tasman Highway, and pulp mill access road respectively for the no rail scenario. These Figures also indicate the revised chemical transport trucks (laden and unladen) and boiler residue trucks (laden and unladen).

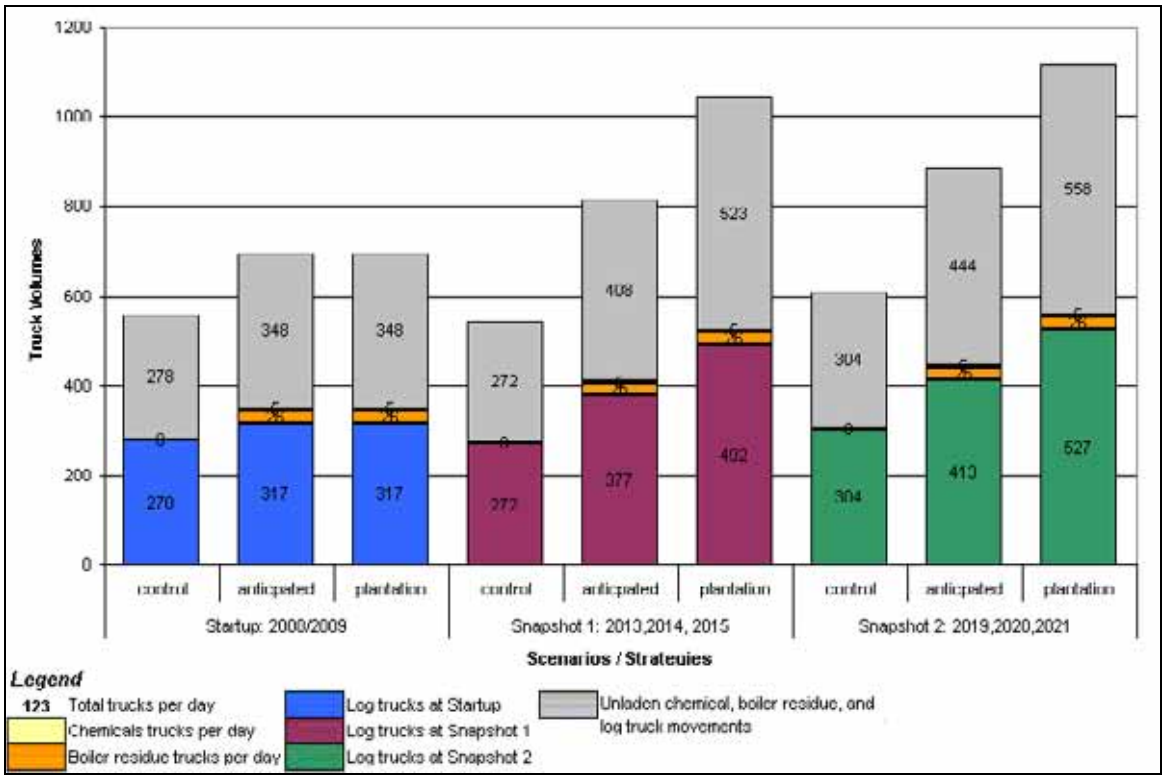

Figure 8 East Tamar Highway Between Longreach Mill Access and Batman Highway, No Rail Scenario

It can be seen from Figure 8 that little change in operational truck volumes occurs on East Tamar Highway at Startup under the no rail scenario. A moderate increase occurs under Snapshots 1 and 2, for both Anticipated and Plantation Strategies using the no rail scenario. The difference between Snapshots 1 and 2 are small for both Anticipated and Plantation Strategies. This demonstrates that although the increase in truck traffic on this road is high compared to the Control Strategy, the increase occurs quickly without ongoing growth over time.

The East Tamar Highway provides the sole vehicular access to the proposed pulp mill site. As with the rail scenario, the transport of chemicals and boiler residue truck traffic is therefore more significant for this road compared to any other major road corridor.

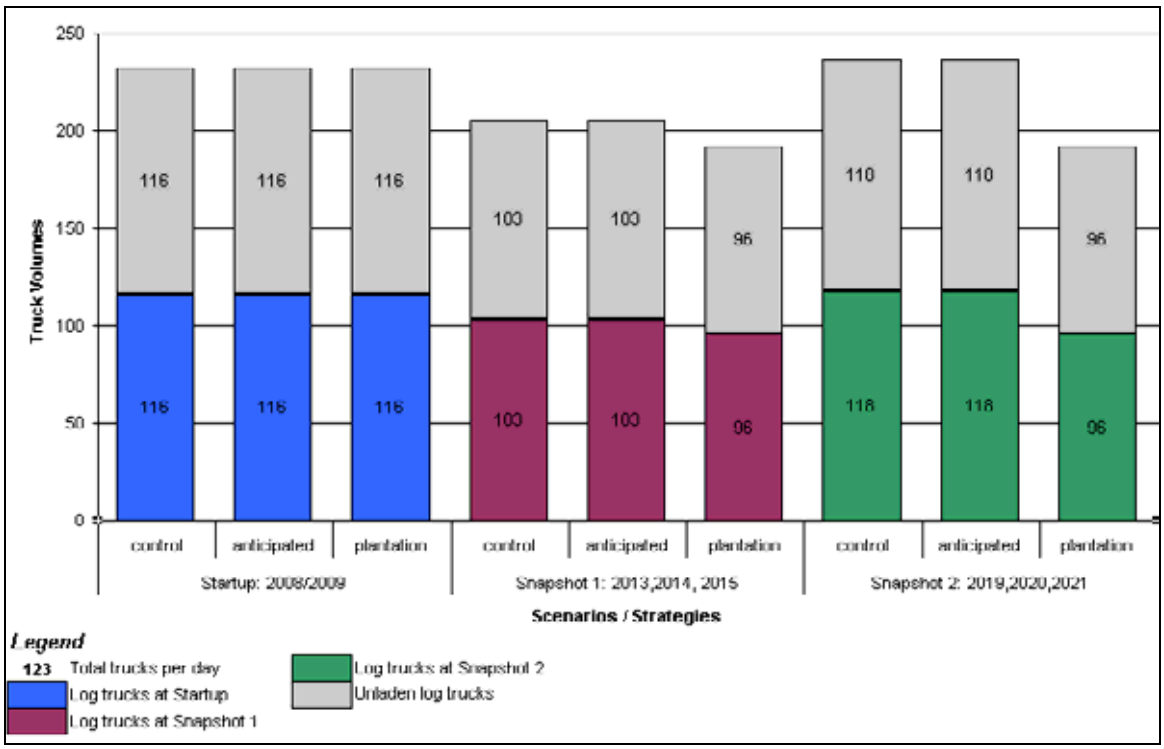

Figure 9 Midland Highway, North of Bridgewater, No Rail Scenario

Little variation between Anticipated and Plantation Strategies can be seen in Figure 9 compared to the Control Strategy across the three timeframes for the no rail scenario. A slight reduction in log truck volumes is experienced in the Plantation Strategy for Snapshots 1 and 2.

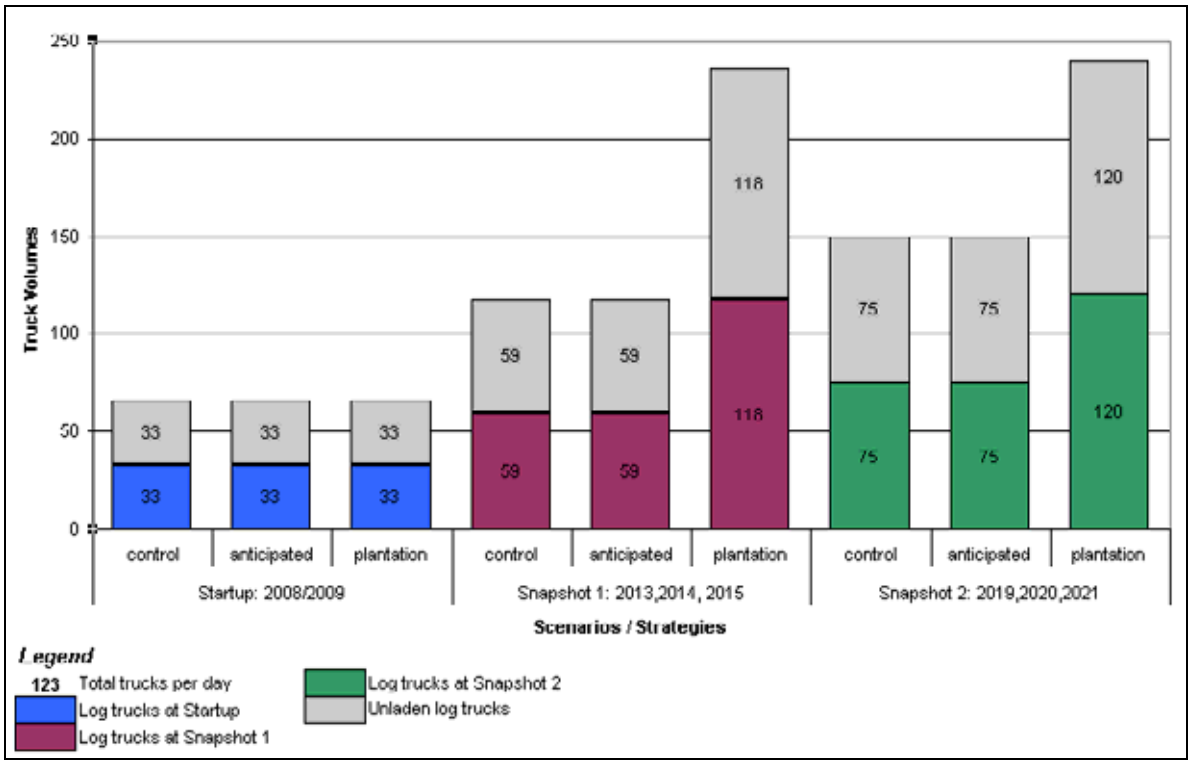

Figure 10 Bass Highway, East of Murchison Highway, No Rail Scenario

Figure 10 shows moderate increase in log truck volumes for the Plantation Strategy for both Snapshots 1 and 2 for this section of the Bass Highway for the no rail scenario.

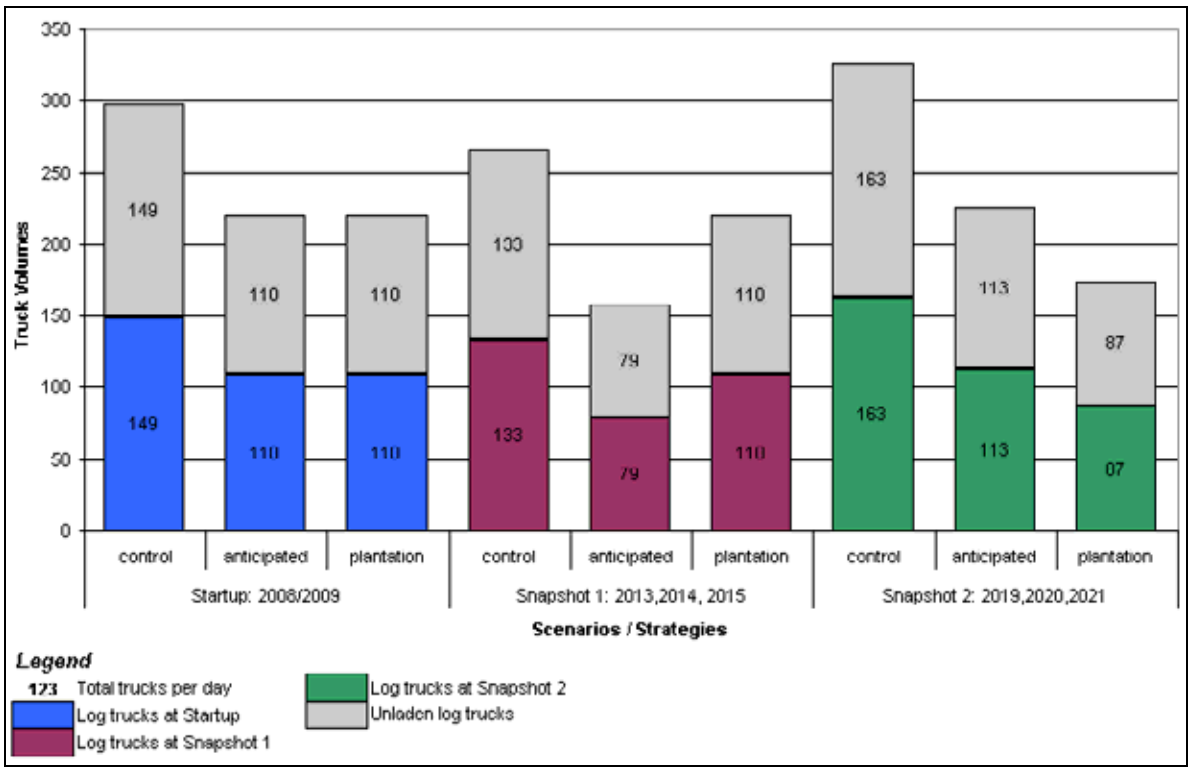

Figure 11 Tasman Highway, Near Orford, No Rail Scenario

As with the rail scenario, Figure 11 shows a general decrease in log truck volumes for both Anticipated and Plantation Strategies compared to the Control Strategy for Tasman Highway near Orford for the no rail scenario.

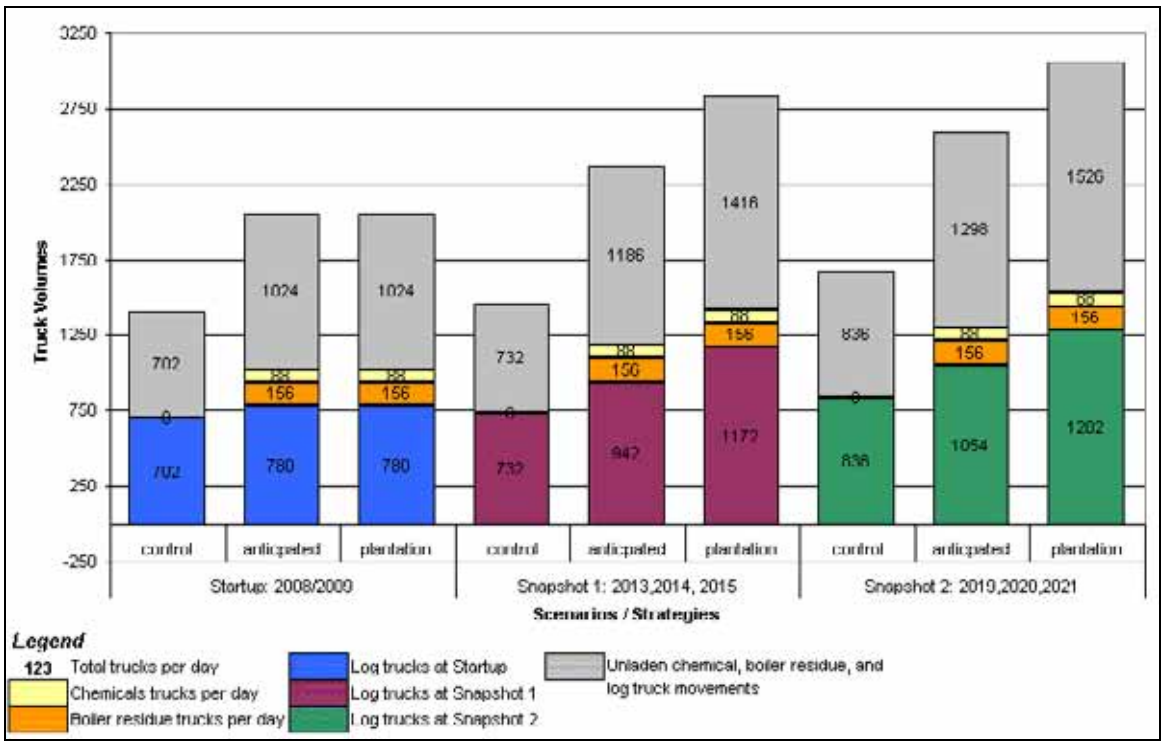

Figure 12 Pulp Mill Access Road, No Rail Scenario

A large increase in truck volumes is shown in Figure 12 for the pulp mill access road for Anticipated and Plantation Strategies compared to the Control Strategy in all timeframes.

4.6.3 Summary of Changes in Log Truck Volumes

The findings from the above sections have been summarised and can be seen in Table 4 below, and include laden and unladen truck trips. The inclusion of unladen truck trips is complimentary to Table 22 of the TIA of the Draft IIS. Decreases in log truck volumes for various roads/ strategies/ timeframes have been highlighted. The increase or decrease in heavy vehicle volume relates to the comparison of the Anticipated or Plantation Strategy compared to the Control Strategy for a given timeframe (Startup, Snapshot 1 or Snapshot 2). Some additional roads have been included in this report to provide a broader understanding of log truck changes on the Tasmanian road network, particularly for roads of interest in various submissions.

Table 4 Log Truck Volume Changes on Key Tasmanian Roads (inclusive of unladen trips)

	CHANGES IN LOG TRUCK VOLUMES FROM CONTROL STRATEGY					
	Startup (2008/09)		*Snapshot 1 (2013-2015)*		*Snapshot 2 (2019-2021)*	
Location	***Anticipated Strategy***	***Plantation Strategy***	***Anticipated Strategy***	***Plantation Strategy***	***Anticipated Strategy***	***Plantation Strategy***
RAIL SCENARIO						
East Tamar Hwy, between Longreach Mill & Batman Hwy	0	-20	0	+76	0	+126
Midland Hwy, north of Bridgewater	-78	-78	-110	-24	-100	-84
Bass Hwy, east of Murchison Hwy	0	0	-102	+16	-108	+12
Tasman Hwy, near Orford	-78	-78	-108	-46	-100	-152
Tasman Hwy, east of Scottsdale	0	0	0	0	0	0
Wellington Street, Launceston City	0	0	0	+26	0	+72
Frankford Main Road, east of Glengarry	0	0	0	+50	0	+50
Batman Hwy, near Batman Bridge	0	0	0	+50	0	+50
Lyell Hwy, west of New Norfolk	0	0	0	-14	0	-44
Arthur Hwy, near Copping	0	0	0	-4	0	0
West Tamar Hwy, sth of Batman Hwy turnoff	0	0	0	+50	0	+50
NO RAIL SCENARIO						
East Tamar Hwy, between Longreach Mill & Batman Hwy	+78	+78	+210	+440	+218	+446
Midland Hwy, north of Bridgewater	0	0	0	-14	0	-44
Bass Hwy, east of Murchison Hwy	0	0	0	+118	0	+90
Tasman Hwy, near Orford	-78	-78	-108	-46	-100	-152
Tasman Hwy, east of Scottsdale	0	0	0	0	0	0
Wellington Street, Launceston City	+78	+78	+108	+52	+100	+164

Frankford Main Road, east of Glengarry	0	0	+102	+388	+118	+282
Batman Hwy, near Batman Bridge	0	0	+102	+388	+118	+282
Lyell Hwy, west of New Norfolk	0	0	0	-14	0	-44
Arthur Hwy, near Copping	0	0	0	-4	0	0
West Tamar Hwy, south of Batman Hwy turnoff	0	0	+102	+286	+118	+282

Table 4 indicates that the East Tamar Highway truck volumes have the largest increases in heavy vehicle volumes for both Snapshots 1 and 2 under the Anticipated and Plantation scenarios for both rail and no rail. This is expected since the East Tamar Highway provides sole vehicular access to the proposed pulp mill. Frankford Main Road also experiences a moderately large increase under the no-rail/Plantation Strategy.

Table 4 also highlights that the rail scenario results in a general decrease in many roads (where decreases in truck volumes are shown in the table as grey highlighted cells).

4.7 Transport of Chemicals

There are several references to the use of chemicals for the operation of the pulp mill, and the transport of chemical throughout various sections the Draft IIS, using transport methods and chemical quantities obtained from Jaakko Poyry. Clarification was sought from Gunns Limited, and the updated version of chemical delivery information was obtained. From this information the expected transport of chemicals to the Pulp Mill is outlined in Table 5.

As with log truck movements, Table 5 includes laden and unladen chemical truck movements. This differs to the analysis contained in the TIA in the Draft IIS, where only laden trips were considered. Unladen trucks have been assumed to return to their origin for the following reasons:

» Provides a simplistic and consistent modelling scenario that accounts for unladen trucks entering each origin.

» Absence of origin-destination information regarding truck movements post-delivery of chemicals to pulp mill means that accurate truck volumes on individual road networks are difficult to obtain.

Table 5 Unladen and Laden Chemical Transport via Trucks

Chemical	Origin	Region Origin	Trucks p/a	Trucks per day	Distance	Entering approach to mill
Export Deliveries from Mill						
Sodium Chlorate	from site to Bell Bay Port	DM	2400	10.00	7.6 km	Northbound from mill
Oxygen	from site to Bell Bay Port	DM	2450	10.21	7.6 km	Northbound from mill
Hydrogen Peroxide	from site to Bell Bay Port	DM	600	2.50	7.6 km	Northbound from mill
Nitrogen	from site to Bell Bay Port	DM	700	2.92	7.6 km	Northbound from mill
Major Deliveries						
Sulphuric acid	shipped to Bell Bay, trucked to site	DM	1186	4.94	7.6 km	North
Hydrochloric acid	shipped to Bell Bay, trucked to site	DM	31	0.13	7.6 km	North
Sulphate	shipped to Bell Bay, trucked to site	DM	708	2.95	7.6 km	North
Peroxide	shipped to Bell Bay, trucked to site	DM	740	3.08	7.6 km	North
Sand	truck from Scottsdale	SZ	150	0.63	82.3 km	South
Limestone	truck from Railton	RO	750	3.13	110.0 km	South
Burnt lime	truck from Railton	RO	229	0.95	110.0 km	South
Magnesium sulphate	shipped to Bell Bay, trucked to site	DM	13	0.05	7.6 km	North
Urea	truck from bell bay	DM	78	0.33	7.6 km	North
Aluminium sulphate	truck from bell bay	DM	55	0.23	7.6 km	North
Baling wire	truck from bell bay	DM	67	0.28	7.6 km	North
Minor Deliveries						
Defoamer	truck from bell bay	DM	28	0.12	7.6 km	North
Talc	truck from bell bay	DM	28	0.12	7.6 km	North
Phosphoric acid	truck from bell bay	DM	15	0.06	7.6 km	North
Sulphamic acid	truck from bell bay	DM	1	0.00	7.6 km	North
Sodium carbonate	truck from bell bay	DM	19	0.08	7.6 km	North

Flocculation aids	truck from bell bay	DM	7	0.03	7.6 km	North
Filtering aids	truck from bell bay	DM	10	0.04	7.6 km	North
Boiler water & steam chemicals	truck from bell bay	DM	1	0.00	7.6 km	North
Miscellaneous	truck from bell bay	DM	1	0.00	7.6 km	North

	Total	**42.65**	**Rounded Up**
Trucks per day entering Longreach Mill Access From:	**Total (south approach)**	4.70	**5**
	Total (north approach)	37.95	**38**

		Laden Trucks	**Unladen Trucks**	**Total Trucks**
Trucks per day travelling on:	East Tamar (south of mill access):	5	5	**10**
	East Tamar (north of mill access):	38	38	**76**
	Batman Highway:	4	4	**8**

The TIA stated a total of 14.1 trucks per day would deliver chemicals to the proposed Pulp Mill, therefore the figures from Table 5 compared with those supplied in the Draft IIS indicate a difference of approximately 28.6 laden trucks per day.

Clarification was sourced by Jaakko Poyry indicating that transportation of caustic soda would not be delivered to Hobart and transported by road to the Pulp Mill as previously stated, but will instead be shipped directly to the pulp mill berth eliminating the risk associated with transportation of dangerous goods by road.

It can be seen from the reviewed figures of chemical transport that there will be an increase of approximately 28.6 trucks per day from the originally stated figures, which is an additional 2 trucks travelling south of the proposed Pulp Mill access, and an additional 56 trucks travelling north of the Pulp Mill access.

Consideration of the unladen chemical transport to and from the pulp mill site provides a total average of 86 trucks per day.

It is my opinion that the revised number of chemical transportation trucks is insignificant in comparison to the future traffic growths and log truck movements, and will not adversely affect the road network in terms of road safety or capacity. Total truck volume information for the East Tamar Highway on both approaches to the pulp mill access can be found in Appendix E (this includes revised chemical delivery transport).

4.8 Construction Impacts

Analysis of the construction phase of the proposed pulp mill undertaken in the TIA of the Draft IIS stated that a localised increase in traffic movements (both light and heavy vehicles) will occur on East Tamar Highway between the pulp mill's access and George Town. This increase also maintains an acceptable level of service for this road, although some reduction in level of service can be expected for the pulp mill access road at its junction with East Tamar Highway. Traffic management techniques can be put in place to minimise the impacts for this approach to the intersection.

To minimise construction impacts, detailed Construction Traffic Management Plans will be required prior to any work commencing in accordance with the DIER codes of practice and Australian Standards, AS 1742.3, Manual of Uniform Traffic Control Devices, Part 3, *Traffic Control Devices for Works on Roads*, 2002.

During the construction of the Water Supply pipeline and Effluent pipeline, Traffic Management Plans will need to be approved by DIER for all road closures necessary for pipeline crossings of a road carriageway, and directly affected landowners will be consulted regarding accesses.

4.9 Operational impacts

The transport of chemicals, other operational materials and associated staff will increase the transport task in the northeast region of Tasmania. This increase was considered in the TIA of the Draft IIS to be acceptable in terms of road capacity. With further analysis undertaken in Section 4.4 of this report, it was found that aside from several roads (including the East Tamar Highway), the other significant roads in the network surrounding the proposed pulp mill may experience a general decrease in log truck volumes when considering both laden and unladen truck movements.

The transport of chemicals for laden and unladen trucks further investigated in Section 4.3 demonstrated that the additional vehicles would not adversely affect the road network. Information relating to the transport of chemicals supplied by Jaakko Poyry indicated that transportation of caustic soda is not proposed to be delivered to Hobart and transported by road to the Pulp Mill as stated in the TIA of the Draft IIS, but will be shipped directly to the pulp mill berth. This therefore eliminates the risk associated with transportation of dangerous goods by road.

Road infrastructure improvements for the East Tamar Highway under recently granted Federal Government funding [2] will further support the expected increase in operational traffic of the proposed pulp mill.

4.10 Response to Community Concerns and Key Submissions

Numerous traffic and transport related issues were raised during the exhibition of the Draft IIS. The following sections deal with those matters raised in submissions that require substantive comment but have not been addressed in the TIA of the Draft IIS.

4.10.1 Pavement Damage

The TIA of the Draft IIS stated that the road pavement impacts as a result of the proposed pulp mill are difficult to predict without detailed asset management information relating to components of the road

[2] $60M funding for upgrading East Tamar Highway as part of the expanded Auslink funding package for Tasmania.

network. Issues of potential pavement damage and maintenance have been considered in more detail in this witness statement.

General comments received during the submissions phase of the Draft IIS process include:

» Fully laden log trucks cause significantly more damage to road pavements compared to cars (figures quoted ranged from 140,000 to 160,000 times equivalent damage).

» Pulp mill related road maintenance is likely to be an issue.

Some comments to address these issues are included in the following sections.

Vehicular Pavement Damage

The design of pavements is generally undertaken on the knowledge of predicted heavy vehicle usage. Austroads Pavement Design manual, 2004 states the following with regards to design traffic:

> *"Because it has been well established that light vehicles contribute very little to structural deterioration, only heavy vehicles are considered in pavement design."*

The figures quoted in the submissions serve to highlight the negligible damage caused by light vehicles (cars) compared to heavy vehicles such as laden log trucks.

Forecast Heavy Vehicle Growth and Pavement Design

Typical road pavement design involves determining the heavy vehicle traffic flow on the road, knowledge of the growth rate of the heavy traffic, and determining the cumulative passage of Equivalent Standard Axles (ESA) over a specified design life for the pavement.

An ESA is broadly defined as a single axle with dual wheels carrying a load of 8.2 tonnes. Heavy vehicles have various axle configurations that can be equated to a total number of ESA's. ESA's provide a reference standard for the design of road pavements. The actual number of ESA's for each heavy vehicle will vary depending on the axle configuration, suspension and other factors.

For the purpose of this report, a fully laden log truck has been estimated to equate to 3.0 ESA's. If we consider the East Tamar Highway as carrying the highest increase of heavy vehicles as a result of the pulp mill, then we can estimate the likely increase in ESA's over a defined timeframe. If a section of East Tamar Highway were to be reconstructed to cater for the predicted heavy vehicle volumes for pulp mill (worst case scenario being no-rail, plantation strategy), and a no pulp mill scenario between the years of 2008 (representing start-up conditions), and 2021 (the extent of the timber resource modelling), a difference of approximately 5.5 million ESA is likely over this timeframe. This represents an ESA increase of approximately 60% compared to the control strategy.

The preferred strategy of utilising rail and the anticipated resource strategy results in a lesser increase of approximately 35% compared to the control strategy over the same timeframe.

The above examples represent the highest increase in ESA likely on any Tasmanian road as a result of the construction of the pulp mill.

Road authorities should consider pavement damage and road maintenance in the context of existing asset management strategies. It should be further noted that whilst there are increases in some roads (such as East Tamar Highway), decreases occur in other roads under various strategies (as highlighted in Table 4). Decreases in pavement loading may result in extending the life of the asset.

4.10.2 Road Safety Implications of Increased Log Trucks

The Transport component of the Draft IIS stated that it was difficult to identify any long term patterns associated with crash rates involving log trucks and heavy vehicles. Road safety implications relating to the operation of the pulp mill was the subject of several submissions during the consultation phase of the Draft IIS.

The Australian Transport Safety Bureau's (ATSB) Monograph 8, *Articulated Truck Crashes,* 2001[3] represents recent national data on fatal crashes where articulated trucks were involved. The major findings of the report can be summarised as follows:

- The number of fatalities and fatal crashes involving articulated trucks peaked in the late 1980s.
- From 1989 to 1991 there was a substantial decrease in the number of crashes and fatalities.
- Since 1997 (to 2000) the number of crashes and fatalities has increased each year.
- The level of activity in the road transport industry, measured by distance travelled and freight carried per kilometre have continued to increase in recent years.
- The fatality rate per distance travelled, while showing improvements in truck 31 percent.

The road fatalities by State/ Territory involving articulated trucks is shown in Table 6. The variability associated with these crashes can be seen across all states, with Tasmania having the third lowest frequency of crashes.

Table 6 Road Fatalities by State/ Territory Involving Articulated Trucks (Source: ATSB)

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Australia
1981	113	44	47	11	12	4	5	0	236
1982	114	39	53	17	17	5	6	0	251
1983	105	42	29	15	15	7	3	0	216
1984	113	45	34	21	12	4	1	2	232
1985	98	36	36	18	18	8	4	0	218
1986	77	39	37	16	15	8	2	0	194
1987	59	52	36	28	17	4	3	0	199
1988	120	54	47	16	13	5	5	0	260
1989	99	57	45	23	18	4	3	1	250
1990	77	51	31	18	15	10	3	0	205
1991	64	35	23	18	11	4	1	0	156
1992	73	27	34	8	10	1	1	0	154
1993	60	34	38	17	18	3	1	0	171
1994	52	36	34	14	13	1	1	0	151
1995	49	31	47	17	12	4	4	1	165
1996	48	33	34	19	23	2	1	1	161
1997	60	26	29	12	13	4	2	0	146
1998	58	30	28	18	12	2	2	1	151
1999	55	35	30	17	20	2	3	1	163
2000	69	32	28	15	12	6	3	0	165

Table 7 provides road fatality rates involving articulated vehicles by State/ Territory per distance travelled and registered vehicles for 1998, 1999 and 2000. It can be seen that Tasmania experienced a large

[3] http://www.atsb.gov.au/publications/2001/pdf/Truck_Crash_3.pdf

increase in articulated truck crashes between 1998, 1999 and 2000 per distance travelled (ranging from 1.59 million kilometres travelled in 1998, 1.85 million kilometres travelled in 1999 and 5.08 million kilometres travelled in 2000). The marked increase for 2000 would be attributable to the fluctuation of fatal vehicle crashes for this year (total of 6 compared to 2 for the previous two years).

It is worth noting that Table 7 shows that for 1998 and 1999, Tasmania had the lowest fatal crash rate involving articulated trucks per registered vehicles.

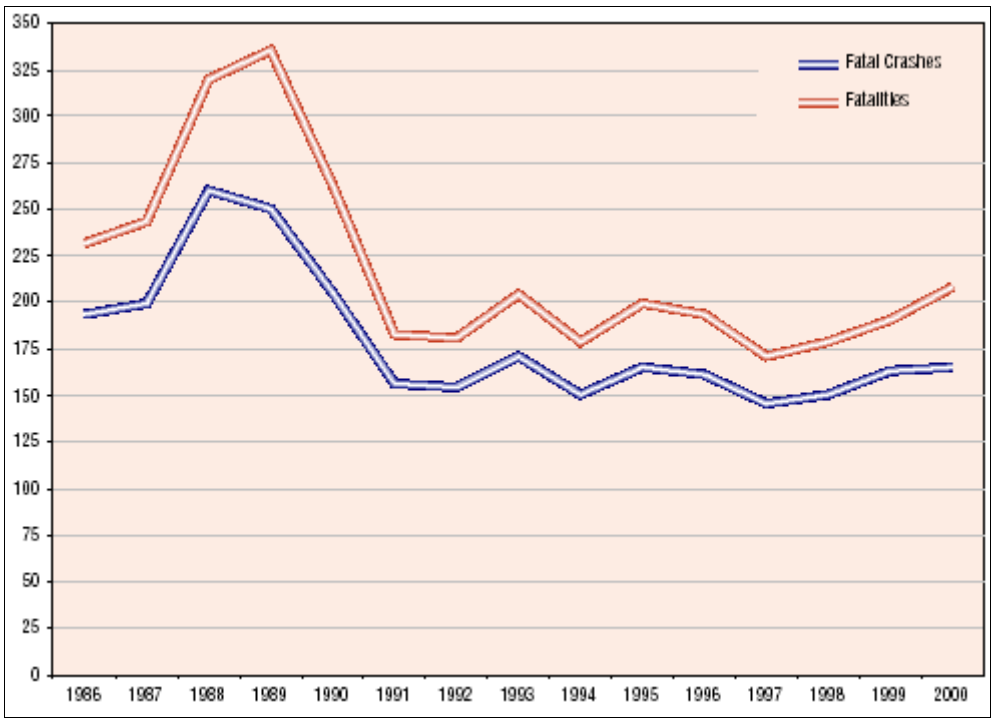

Figure 13 Fatal Crashes and Fatalities Involving Articulated Trucks in Australia (Source: ATSB)

Figure 13 shows the trends in articulated truck fatal crashes and fatalities in Australia between 1986 and 2000. It shows that articulated truck crashes have been relatively steady since a sharp decline in crash rates from 1989.

Figure 13 clearly demonstrates that a fluctuation between years is not necessarily dependent on the number of trucks on the road, or the total distance travelled.

Table 7 Road Fatality Rates Involving Articulated Trucks by State/ Territory (Source: ATSB)

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Australia
Per distance travelled [a]									
1998	5.84	2.30	3.23	4.28	2.65	1.59	2.38	6.45	3.64
1999	4.78	2.65	3.31	4.00	4.24	1.85	3.23	3.13	3.63
2000	6.02	2.48	3.79	3.44	2.66	5.08	8.33	0.00	3.90
Per registered vehicle [b]									
1998	42.38	18.47	26.70	40.52	17.76	13.21	24.39	77.82	28.74
1999	39.32	21.52	29.77	35.40	30.11	13.32	36.86	40.65	30.18

[a] 100 million kilometres travelled, ABS Catalogue 9208.0
[b] 10,000 registered articulated trucks, ABS Catalogue 9309.0

A further study by the ATSB, Monograph 15, *Articulated Truck Fatalities,* 2003 presented more up to date and similar findings for articulated fatal crashes in Australia. Table 8 provides fatality rates for articulated trucks in Australia compared to kilometres travelled, tonne kilometres travelled and average ton-kilometres, and number of articulated trucks. It can be seen from this table that the number of fatalities for each year between 1991 and 2002 remain relatively constant, with no real trends. This has occurred whilst the number of articulated trucks have increased steadily over this timeframe, along with a steady increase in kilometres travelled and tonne-kilometres. This indicates that there is no direct comparison between crash rates with the number of trucks on the road, and the distances travelled by these trucks. This is consistent with the findings of the TERNZ report referenced in the Draft IIS regarding heavy vehicle road safety, and the conclusions that the available crash data for log trucks is highly variable, and that no direct link can be found between increased log truck usage and crash rates.

Table 8 Articulated Trucks 1991 to 2002 (Source: ATSB)

	Fatalities involving articulated trucks	Fatal crashes involving articulated trucks	Kilometres travelled (million)	Average kilometres ('000)	Tonne kilometres (million)	Average tonne-kilometres ('000)	Number of articulated trucks
1991	183	156	3 959	76	62 906	1 241	52 106
1992	181	154	-	-	-	-	-
1993	204	171	-	-	-	-	-
1994	179	151	-	-	-	-	-
1995	199	165	5 094	88	89 384	1 592	57 939
1996	194	161	-	-	-	-	-
1997	171	146	-	-	-	-	-
1998	179	151	4 921	84	86 892	1 657	58 794
1999	191	163	5 262	86	99 120	1 812	61 242
2000	208	165	5 578	91	103 515	1 852	61 117
2001	178	146	5 321	87	101 892	1 804	61 502
2002	202	173	5 500e	-	102 000e	-	-

- not available
e ATSB estimate

Sources: Australian Transport Safety Bureau and Australian Bureau of Statistics.

From the information provided in Table 8, the increase in registered articulated trucks in Australia from 1991 to 2002 have been plotted against the number of fatalities involving articulated trucks over the same period. The results provided in Figure 14.

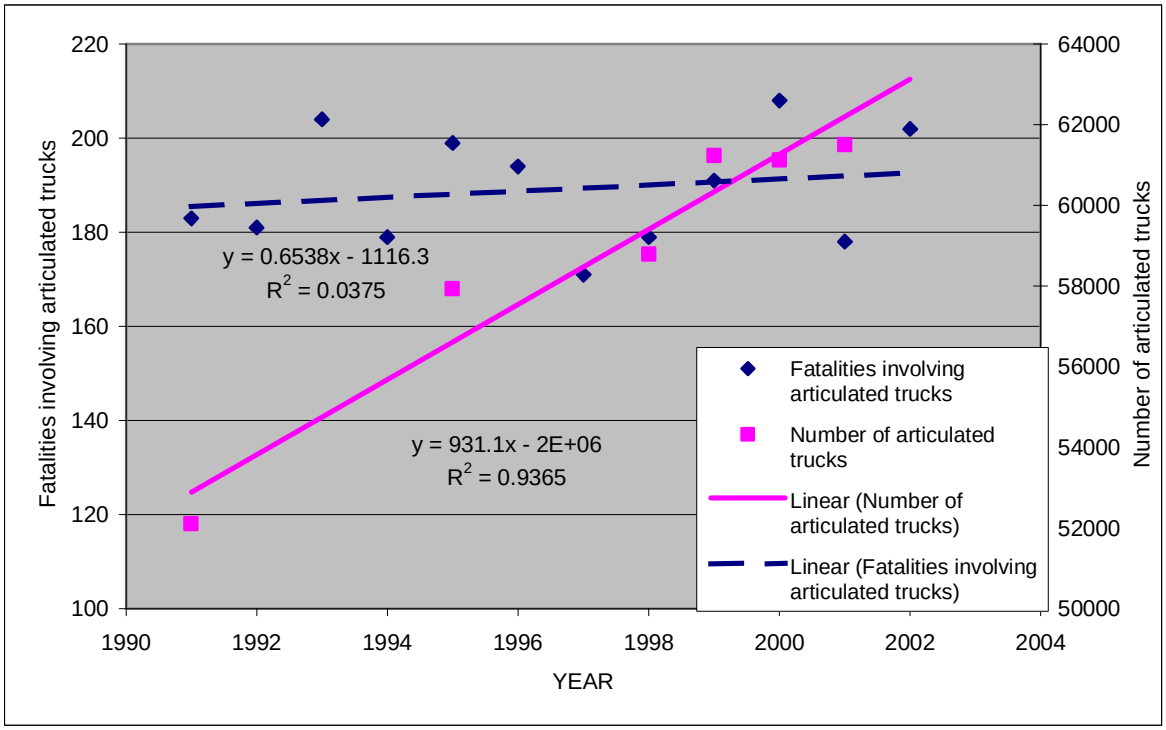

Figure 14 Number of Articulated Trucks vs Fatalities Involving Articulated Trucks

Figure 14 indicates that there is little relationship between the increase in registered articulated trucks in Australian and the rate of fatalities involving articulated trucks. The number of articulated trucks has increased at a relatively steady rate, whereas fatal crashes involving articulated trucks has remained fairly steady with a high degree of variability. There is a strong correlation of increasing truck registrations per year as demonstrated by the R^2 value of 0.9365 (being very close to unity). Conversely. there is no statistically significant relationship between articulated trucks per year, as demonstrated by the R^2 value of 0.0375.

Log trucks are a subset of the articulated truck registrations and fatalities, and therefore it is likely that there is also little correlation of fatalities and registrations for this heavy vehicle type.

Log Truck Crash Trends

The TIA of the Draft IIS stated that there were no apparent trends on log truck and high productivity vehicle crashes in Tasmania over the past five years. Figure 15 provides a representation of these crashes, with a linear trendline. It can be seen that an overall downward trend can be interpreted from this dataset obtained by linear regression techniques. The R-squared coefficient relates to the 'goodness of fit' of the linear regression trendline, with a number close to 1.0 representing a strong correlation between the axes. In this case the R-squared coefficient is 0.51 indicating a poor fit.

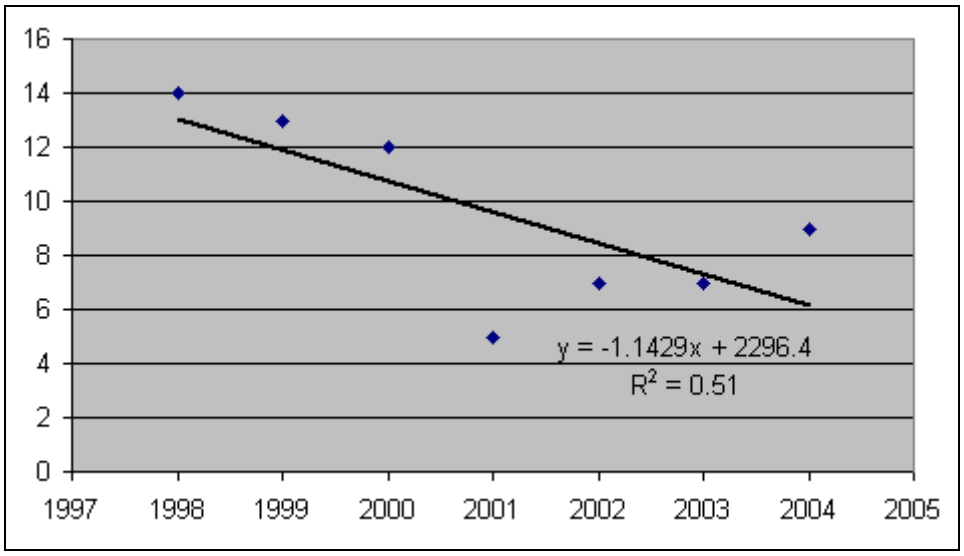

Figure 15 Log Truck and High Productivity Vehicle Crashes in Tasmania

Furthermore, the average crash rate per year between 1998 and 2005 was 9.6 crashes per year, with a standard deviation of 3.5. If a constant log truck and high productivity crash rate were assumed for these years, then a high degree of variation is evident across this timeframe.

It is therefore my opinion that the crash data for log trucks and high productivity vehicles does not follow any specific trends over the five-year timeframe of data. It would therefore not be possible to draw any specific conclusions regarding log truck and high productivity crashes with regards to their respective increases or decreases in their volumes or kilometres travelled.

4.10.3 East Tamar Highway

Table 4 provides the total traffic generation, into and out of site, for rail and no rail scenarios on significant roads in the Tasmanian road network. The worst-case scenario for the East Tamar Highway according to this table is Snapshot 2 under the Plantation strategy, which indicates an increase of approximately 446 log trucks per day without rail.

In my opinion this increase is reasonable since the East Tamar Highway provides the sole access to the proposed pulp mill. In my opinion the East Tamar Highway has the capacity to cater for this increased volume. Construction and Operational traffic associated with the pulp mill will lead to a significant increase in heavy vehicle traffic, which in turn may lead to pavement implications for the East Tamar Highway. However the Federal Government in the last election committed $60 million of funding for East Tamar Highway road infrastructure improvements. DIER is currently allocating money to various projects along the highway to improve safety, and general operating efficiency as a result of Federal Government's commitment of $60M for this road corridor. Such projects are likely to include:

- Intersection redesigns;
- Shoulder widening;
- Road bypasses;
- General traffic engineering improvements; and

» Resealing works.

It is considered that these projects under the funding package should address the safety capacity issues associated with the increase in heavy vehicles and general traffic associated with the proposed pulp mill and other developments along the East Tamar Highway.

4.10.4 George Town Traffic

It is difficult to accurately quantify the likely traffic in George Town as a result of the pulp mill. It is unlikely that there would be a large increase in heavy vehicle traffic in George Town when the pulp mill is operational, but there will be increased light vehicle traffic as a result of workers living in this region and other indirect impacts (such as more trade in George Town to cater for increased localised population, etc).

There is an estimated 275 light vehicle movements to the pulp mill each day, I have assumed that 40% of these trips originate in George Town (consistent with Section 6.1 of the TIA of the Draft IIS), then there is a traffic generation of approximately 110 vehicles per day. Accounting for return trips, as well as non-mill related local activities, there may be approximately 280 vehicles per day in the George Town region.

As highlighted in Section 4.5 of this report there is likely to be an increase of 1,200 vehicles per day in and around George Town associated with the proposed workers accommodation facility. Additional traffic is also likely as a result other worker accommodation in the region, increased trade of the area to support increased population, and other factors. In my opinion, this traffic can be readily absorbed into George Town's road network. As with all local road networks, the road safety performance and capacity of intersections should be monitored during the construction and operational phases of the pulp mill and appropriate traffic management solutions to identified issues incorporated where necessary.

4.10.5 Launceston Traffic

The city of Launceston is the second largest urban centre in Tasmania. Its close proximity to the proposed pulp mill is likely to result in an increase of log truck traffic through the major arterial roads through it.

The main routes connecting to, or traversing Launceston include:

» Bathurst Street;

» Tasman Highway;

» West Tamar Highway

» East Tamar Highway; and

» Wellington Street.

Table 4 in Section 4.6.3 confirms that there will be an increase in log trucks travelling on Launceston's major arterial roads from the proposed pulp mill. These volumes take into account unladen log truck movements.

The largest increase in log truck movements is expected on the East Tamar Highway as discussed in Section 4.10.3, which could expect an additional 446 movements per day under the Snapshot 2, Plantation Strategy compared to the Control Strategy for Snapshot 2. This represents an increase of less than 10% of the 2003 traffic volume, and is therefore not likely to have any impact on capacity. It is

likely that the extra movements on the East Tamar Highway will feed to or from the major connecting arterial roads identified above to timber resource regions.

Wellington Street is likely to experience an increase of 164 log trucks per day under a no-rail, Plantation Strategy in Snapshot 2. This represents an increase of less than 1% of the 2005 traffic volume, and is therefore not likely to have any impact on capacity. The log truck volume increases are significantly lower than this under the rail scenario, with 26 and 72 additional trucks with the Plantation Strategy for Snapshots 1 and 2 respectively.

West Tamar Highway, south of the Batman Highway turnoff is likely to experience an increase of 282 to 286 log trucks per day for Snapshots 2 and 1 respectively under the no-rail, Plantation Strategy. This represents an increase of less than 8% of the 2003 traffic volume, and is therefore not likely to have any impact on capacity. The log truck volume increases are significantly lower than this under the rail scenario, with 50 additional trucks under the Plantation Strategy for both Snapshots 1 and 2.

Tasman Highway, near Orford is likely to experience a decrease of up to 152 log trucks per day for Snapshots 2 under the rail and no-rail, Plantation Strategy. Tasman Highway, east of Scottsdale is likely to experience no change in log truck traffic for rail and no-rail scenarios and all strategies.

Bathurst Street is expected to experience a similar increase to that of Wellington Street, therefore an increase in the order of 1% of the 2005 traffic volume would be expected under a no-rail, Plantation Strategy in Snapshot 2.

It should be noted that the changes in log truck volumes shown in Table 4 represent the difference between the Anticipated and Plantation Strategies with the Control Strategy for each Snapshot. It is not the difference between the current traffic volumes. The Control Strategy volumes of log trucks for Snapshots 1 and 2 will differ from the original traffic volumes since they have been factored to represent a future volume of log trucks with existing chip mill operations (ie. no construction of a pulp mill), however the background traffic volume will also increase over time, so the percentages represent a likely occurrence in log truck changes and may in fact be a conservative estimate.

4.10.6 Log Truck Volume Percentage Increase

Several submissions were received commenting on the quoted percentage decrease of 227% and 241% of truck volumes for Colebrook Main Road Table 20 in the TIA of the Draft IIS for Anticipated and Plantation Strategies respectively. Comments relating to this issue referred to the impossibility of achieving a decrease of more than 100%.

This particular table compared recorded 2003 heavy vehicle volumes on selected roads with the difference between various strategies (Anticipated and Plantation with Control) in future timeframes. This was undertaken to provide a general comparison of existing heavy vehicle volumes with the likely change in log truck volumes over time. For Colebrook Main Road, the difference between Anticipated and Plantation to Control Strategies is more than twice the heavy vehicle volume as recorded by DIER in 2003. In absolute terms, it means that there is a low volume of heavy vehicles currently utilising this road, and there is likely to be an increase for the Control Strategy over time.

The actual reduction in log truck movements for this scenario was in the order of 50 laden log trucks compared to the Control Strategy.

4.10.7 Access Junction to Pulp Mill

Access to the pulp mill is proposed via the existing road that connects to the East Tamar Highway approximately 3.5 kilometres north of the Batman Highway junction. East Tamar Highway has two northbound lanes adjacent to the access junction, and an outside passing lane for the southbound lane for vehicles to pass stationary right turning vehicles entering the Chip Mill access.

Gunns access road is approximately 1.2 kilometres in length provides the primary access to the existing Chip Mill. The access road is two-lane/ two-way configuration and has a posted speed limit of 60 kilometres per hour.

In the Draft IIS submission, an Austroads Type C junction treatment was recommended for the access junction to the proposed pulp mill. Since the preparation of the Draft IIS, the Austroads 2005, Guide to Traffic Engineering Practice – Part 5: Intersections at Grade has been released. Under the new guidelines, the intersection treatment required for the junction is a Type CHR Rural Intersection Layout with deceleration lanes for vehicles turning into the access from both directions on the Highway, and accelerating lanes to shelter heavy vehicles turning out of the site and entering the high speed zone of the East Tamar Highway.

Heavy vehicles traversing between the pulp mill and the landfill/quarry site are required to merge with traffic on the East Tamar Highway on an incline, then travel 1.4km to the landfill/quarry site and make a right turn across traffic into this access. An acceleration lane adequate in length to accommodate the heavy vehicles exiting the pulp mill site is required as part of the intersection design, as is the provision of sufficient right turning storage room for vehicles entering the pulp mill site from the East Tamar Highway.

4.10.8 Identified Route Analysis

A number of submissions were made in relation to particular routes presumed to be effected by the proposed pulp mill development. Some of these roads have been previously addressed in this report, in particular the East Tamar Highway, and the major roads through George Town and Launceston. In particular the following roads were part of a number of concerns:

- Frankford Main Road;
- Batman Highway;
- Birralee Main Road;
- West Tamar Highway; and
- Brooker Highway.

Frankford Main Road

Several submissions highlighted road safety concerns relating to increased log truck volumes on Frankford Main Road.

In the worst-case scenario Frankford Main Road under the Snapshot 1 (note that Snapshot 2 has a slightly lower log truck difference of 141 vehicles compared to the Control Strategy), Plantation Strategy with no rail scenario is an increase in 388 log trucks per day. Whilst the increase in overall traffic for Frankford Main Road is only approximately 22% under this operational strategy, the increase in heavy vehicle traffic was 123%. This large heavy vehicle percentage increase for Frankford Main Road and

Batman Highway is due to an increase in resource usage for the proposed pulp mill from the northwest region, which currently stays within the northwest region under existing conditions.

This increase in log truck traffic in Frankford Main Road is considered to be a negative impact due to the narrow and winding geometry of this road. If rail is not to be used for the proposed pulp mill, then it is my opinion that a detailed route corridor assessment should be undertaken to ensure that associated traffic management measures are undertaken for this potential log truck traffic increase. Such measures may include road widening or edge sealing, improved delineation through curves, and improved line marking.

Batman Highway

The Batman Highway will experience the same increase in log truck volumes as the Frankford Main Road, meaning an increase of 388 log trucks will be expected under the Snapshot 1, Plantation Strategy with no rail scenario. The log truck volume increases are significantly lower than this under the rail scenario, with 50 additional trucks under the Plantation Strategy for both Snapshots 1 and 2. The increase in overall traffic for the Batman Highway is only approximately 19% under this operational strategy, however the increase in heavy vehicle traffic is expected to be 114%. However the Batman Highway will more likely be able to adequately accommodate this increase in heavy vehicles.

Birralee Main Road

A number of submissions made reference to the impact on Birralee Main Road under the proposed pulp mill, however it is anticipated that under both the rail and no rail scenarios there will be no change in log truck volumes on the Birralee main rd.

West Tamar Highway

In the worst-case scenario the West Tamar Highway under the Snapshot 1, Plantation Strategy with no rail scenario will experience an increase in 286 log trucks per day. The log truck volume increases are significantly lower than this under the rail scenario, with 50 additional trucks under the Plantation Strategy for both Snapshots 1 and 2. The increase in overall traffic for the West Tamar Highway is only approximately 7% under this operational strategy, however the increase in heavy vehicle traffic is expected to be 69%.

Brooker Highway

Log truck volumes on the Brooker Highway are anticipated to decrease under the rail scenario, and there will be no change under the no-rail scenario.

Roads Near Pipers River and Bridport

A submission was received regarding concerns about log truck movements in and around Pipers River and Bridport. Specific mention was made of Routes B82, B83 and B84.

Bridport Main Road (Routes B82 and B84) connects between Bridport and George Town. The road currently carries between 6,000 vehicles per day near Scottsdale to 1,500 vehicles per day near East Tamar Highway[4]. Under all modelling scenarios (rail, no rail, Anticipated Strategy, Plantation Strategy) and timeframes, there are no changes in log truck volumes when compared to the Control Strategy.

Pipers River Secondary Road (Route B83) connects between Rocherlea and Pipers River. The road currently carries between 500 vehicles per day near Pipers River and 1,200 vehicles per day near

[4] DIER AADT estimates, 2003

Lilydale Main Road[5]. Specific modelling of log truck movements was not undertaken for this road in the TIA of the Draft IIS. The resource zone the connects to this road is Lilydale. Log truck generation from the Lilydale zone averages to 15 laden trips per day for all scenarios (Control, Anticipated and Plantation) in Startup timeframe, and increases to 23 laden trips per day for all scenarios (Control, Anticipated and Plantation) in Snapshot 2 timeframe. Therefore there will be no net change in log truck volumes travelling along this road corridor as a result of the pulp mill (ie. there is no difference between Control and pulp mill strategies). This applies to both rail and no rail scenarios.

Avoca, Cressy, Longreach and Perth Townships

A submission was received detailing concerns regarding increased traffic in the abovementioned townships. Concerns related to increased truck movements and associated noise, traffic, congestion, conflict with pedestrian and historic values.

The townships of Avoca and Perth will not experience any change in log truck movements as a result of the pulp mill compared to the Control Strategy.

Gunns currently operate two woodchip mills in Long Reach, which is the proposed site of the pulp mill. This location will have the greatest increase of truck and other traffic of any location in the State. The details of increased truck and traffic movements have been detailed in the TIA. When considering unladen truck movements for log trucks, chemical and boiler residue, Table 9 details the increases along the main access road into Gunns.

Table 9 Gunns Pulp Mill Access Log Truck Comparison to Control Strategy

	Startup		Anticipated		Plantation	
	Anticipated	Plantation	Anticipated	Plantation	Anticipated	Plantation
Rail	0	0	0	76	0	126
No Rail	78	78	210	440	218	446

It can be seen that there is no change under the rail/ Anticipated Strategy, and a small increase for the rail/ Plantation Strategy. There is a large increase in log truck (laden and unladen) volumes without the use of rail. The TIA assessed the intersection of the access road with East Tamar Highway, and concluded that the junction will provide a high level of service

4.10.9 Rail Option

Numerous submissions received in response to the Draft IIS related to the use of rail. These included:

» The pulp mill's reliance on rail for its operational viability; and

» Operational details of rail into the pulp mill site.

[5] DIER AADT estimates, 2003

The analysis undertaken in the TIA and this expert witness statement consider both rail and no-rail scenarios for the haulage of some timber resources around the state associated with the pulp mill. Gunns have expressed a preference for the use of rail as part of its operational strategy for the pulp mill.

Negotiations are currently underway at a Government level as to the future of rail. Details of these negotiations between Government agencies, rail operator and other key stakeholders was not publicly available at the time of preparing this witness statement.

The analysis of log truck movements on a statewide basis clearly demonstrates a large reduction of log truck movements can be achieved through the use of rail. This is highlighted in Table 4, where shaded cells in the table indicate a reduction of log truck movements for selected roads. For this reason, my opinion is that the use of rail is a preferable strategy.

The analysis has also concluded that the State's road network can adequately cater for both the Anticipated and Plantation Strategies with the use of rail. The current operation of Gunns chip mills around the State do not utilise rail, and therefore an increase in log truck movements will be experienced regardless of whether the pulp mill proceeds.

4.10.10 Chemical Delivery Transport

Several submissions commented on some discrepancies relating to the transport of chemicals to the pulp mill between sections of the Draft IIS, or within individual tables of the Draft IIS. Specifically Table 13 of the TIA and Volume 6, Table 3-28. A number of submissions highlighted concern regarding the transport of caustic soda from Hobart by road transport.

Chemical delivery transport volumes have been updated to include laden and unladen truck movements in Section 4.7. It was found that the revised number of chemical transportation trucks is very low in comparison to the future traffic growths and log truck movements, and will not adversely affect the road network.

As discussed in Section 4.7, the delivery of caustic soda is now to be by sea direct to pulp mill berth as opposed to being shipped to Hobart and transported by road to the pulp mill. Thus reducing the road safety risk of transporting dangerous goods via road.

5. Response to BECA AMEC Report

5.1 Rail Infrastructure

The Beca AMEC report stated:

> *"Anticipated scenario combined with rail is the preferred option – but there is little discussion as to the infrastructure, capacity or capability of rail".*

The use of the rail network is highly dependent on the success or otherwise of the future upgrade of rail in Tasmania. At the time of preparing the TIA and this expert witness statement, it was unclear as to the condition of the existing rail network, or the status of the proposed upgrades currently being investigated by State Government. It is for these reasons that the use of rail, whilst identified as having strong benefits for the proposed pulp mill and Tasmania's road network, cannot be assured. The operation of the proposed pulp mill has also been modelled without the use of rail to determine the potential impacts if this mode of log transport is not utilised.

5.2 Log Truck Queuing Analysis

The Beca AMEC report stated:

> *"Unloading at the proposed pulp mill proposes that 80% of trucks will arrive between 6am and 6pm. An assumed average weighbridge/ unloading time of 11 minutes could lead to some very long queues or the requirement for additional weighbridges/ waiting lanes. These aspects have not been quantified in the document".*

From basic queuing theory, the queue length not exceeded 95% of the time can be determined from the following formula:

$$P(n>N) = (r/s)^{N+1}$$

Where –

n = queue length

N = 95%ile queue length

P(n>N) = probability of queue length exceeding N (in this case P = 0.95)

r = arrival rate of log trucks

s = service rate (equals 11 minutes on average to unload a log truck)

Assuming a worst case scenario of 763 laden log trucks arriving at the pulp mill (this is Snapshot 2, Plantation and no-rail scenario, providing the highest arrival rate of all scenarios). A total of 610 trucks will arrive in the twelve-hour period between 6am and 6pm (being 80% of daily volume). This equates to an average of 51 trucks per hour.

The total service time to unload each log truck is 11 minutes. This includes weigh-in, unloading and weight out components, of which there may be multiple trucks within the full process at any one time.

The existing operations currently utilise up to three Raygo Wagners vehicles (specialised trucks used in the unloading of logs from log trucks). The proposed pulp can readily utilise four or more of these vehicles to increase capacity of throughput. This provides a service rate of 120 trucks per hour. Queuing associated with this activity with a maximum arrival rate of 51 trucks per hour would be less than 1 vehicle 95% of the time. Similarly, if only 3 unloading Raygo Wagners are used, queues would not exceed 2 trucks 95% of the time.

The existing weigh-in procedure currently takes on average 2 minutes per truck. This process involves a weighing and load inspection that is usually undertaken by one operator. During high delivery times, two operators are often used to decrease the service time for this component of the unloading. This reduces the service rate to around one minute or less. With arrivals of 51 trucks per hour, and a service rate of 60 vehicles per hour, queues would not exceed 18 trucks 95% of the time.

The weigh-out procedure is conducted by the truck driver as they exit the unloading area. The weighbridge is not manned – the driver moves onto the weighbridge, exits his vehicle to obtain a docket and drives off. This procedure takes less than one minute and therefore queuing associated with this activity would be less than 18 trucks 95% of the time.

It should be noted that the average total time from the log truck being unloaded to exiting the weigh-out station is around 3 minutes (as stated in Section 2.2.3 of the TIA of the Draft IIS). This time would include time waiting in any queue associated with the weigh-out bridge as well as travel time between these two components.

Therefore under the worst-case scenario, queuing is not likely to cause any operational issues for the pulp mill. All predicted queues can readily be accommodated within the pulp mill site.

5.3 Road Safety

The Beca AMEC report provided some comments on the road safety, particularly the use of crash rates per vehicle kilometres travelled or per trucks registered. Comprehensive additional road safety analysis is provided in Section 4.10.2 of this witness statement that addresses these concerns.

5.4 Launceston Crashes

The Beca AMEC report noted differences in the crash numbers in Launceston City between Figure 7 and Table 4 of the TIA (being 9 and 4 crashes respectively).

It should be noted that Figure 7 and Table 4 within the TIA of the Draft IIS represent different crash information. Figure 7 provides a Statewide log truck and high productivity crash rate summary by local government area. Table 4 provides crash rates by road and road owner. Table 4 in the TIA of the Draft IIS indicates that 4 crashes occurred on roads *owned* by Launceston City Council. The remaining 5 recorded crashes in this municipality occurred on State owned roads.

5.5 Davey St, Macquarie St, Wellington St & Bathurst St Heavy Vehicle Percentages

The Beca AMEC report requested heavy vehicle percentages for Davey, Macquarie, Wellington and Bathurst Streets. Whilst it is agreed that this information would be useful, no recent data was available from Hobart City Council, Launceston City Council or DIER.

5.6 Total Log Truck Generation

Beca AMEC reported that in Section 6.4 of the TIA of the Draft IIS, the last two cells of Table 15 in the bottom row should read “418” and “855” respectively. This has been reviewed, and a revised table is provided in Table 10 below.

Table 10 Revised Total Truck Volume Generated

Model	Trucks per day – South	Trucks per day – North West	Trucks per day – North East	TOTAL
Startup (2008/2009)	175	125	351	**651**
Snapshot 1 (2013-2015)	153	226	366	**745**
Snapshot 2 (2019-2021)	186	251	418	**855**

This minor typographical error did not transfer onto any other analysis undertaken in the TIA of the Draft IIS.

6. Conclusions

6.1 Summary of Rating Assessment

Based on the findings contained in this statement, my opinion remains unchanged from the findings of the Draft IIS, with the preferred scenario is clearly rail utilising the anticipated scenario. Due to the uncertainties in the future of the rail network in Tasmania; a "No Rail" scenario was also tested in the Draft IIS. Whilst Tasmania's road network can accommodate the traffic associated with this scenario, the increased log truck traffic on some roads creates some negative impacts on the road transport system. It should be further noted that the loss of Tasmania's rail network for the haulage of freight would have implications for the road transport system irrespective of the pulp mill proceeding, as it would generate a significant increase in heavy vehicle traffic on Tasmania's road system.

The transport impacts arising from the proposed pulp mill vary substantially depending on the use of rail infrastructure, resource strategy and timeframe. For this reason the summary of key transport impacts has been separated into general, rail and no-rail categories.

As with the TIA of the Draft IIS, transport impacts have been categorised into a rating system.

Transport impacts arising from the proposed pulp mill may be direct or indirect, adverse or beneficial, short or long term, temporary or irreversible. Each cost and benefit is rated in terms of the level or severity of the potential impact. Mitigation strategies, where appropriate, are defined and the impact of the mitigation rated in general terms. Taking the mitigation impact into account, a final cost/ benefit rating for each cost and benefit is provided. The key for each rating used within the cost-benefit assessment as utilised in the TIA of the Draft IIS is provided in Table 11.

Table 11 Key For Each Rating Used Within The Cost-Benefit Assessment

Rating	Nature and Scale of Impact	Interpretation
+++	Major positive impact	Classed as impacts that are beneficial to the physical, biological or human environment. The impact is likely to have a significant effect on the environment.
++	Moderate positive impact	Classed as the impacts that are beneficial to the physical, biological or human environment. The impact may be managed through normal and appropriate environmental management practices to enhance the impact, or not have any long term impact on the physical, biological or human environment.
+	Minor positive impact	Classed as the absence of no acceptable long-term impacts on the physical, biological or human environment.
0	Insignificant impact	No negative or positive impact on the physical, biological or human environment.

Rating	Nature and Scale of Impact	Interpretation
-	Minor negative impact	Classed as the presence of no unacceptable long-term impacts on the physical, biological or human environment.
--	Moderate negative impact	Classed as the impacts that are manageable through normal and appropriate environmental management practices and which will not have any unacceptable long term impacts on the physical, biological or human environment.
---	Major negative impact	Classed as impacts that are likely to have a significant effect on the environment. Long term impacts on the physical, biological or human environment even with environmental management practices.
----	Catastrophic negative impact	Classed as impacts that are likely to have a catastrophic effect on the environment. This could include regional or national extinction of flora and fauna species, short and long term human health impacts or significant changes to the physical environment on a regional scale.

6.1.1 Construction Phase Key Transport Impacts

The major impacts arising from the construction phase of the proposed pulp mill are summarised in Table 12.

Table 12 Summary of Key Construction Transport Impacts

Potential Impact	Proposed Management	Potential Impact Rating	Management Impact	Cost/ Benefit Rating
Additional traffic generated from construction of workers accommodation facility	Consult with DIER. Undertake detailed traffic impact assessment to determine appropriate access locations and traffic distribution. Undertake appropriate traffic management measures in George Town area to accommodate general increase in traffic.	--	+	-
Short term traffic issues associated with	Consult with DIER.	--	+	-

Potential Impact	Proposed Management	Potential Impact Rating	Management Impact	Cost/ Benefit Rating
construction of effluent pipeline	Prepare suitable traffic management plan for construction. Consult with adjacent land owners and effected stakeholders.			
New permanent intersection on East Tamar Highway for quarry, landfill and water storage reservoir	Consult with DIER. Comply with Forest Practices Code 2000. Monitor traffic operations during the early stages of the development to evaluate and amend trucking operations if required.	-	0	-
New temporary access roads	Consult with DIER. Comply with Forest Practices Code 2000.	-	0	-
Reduction of Level Of Service of existing Gunns access to pulp mill site during construction	Consult with DIER. Modify junction to Austroads Type C with extended left turn lane exit. Monitor traffic operations during early stages to evaluate and amend if necessary. Conduct road corridor review to determine additional construction warning signage requirements, and identify existing road safety deficiencies with road.	--	+	-

6.1.2 Rail Scenario Summary of Key Impacts

The major impacts arising from the operational phase of the proposed pulp mill when utilising rail are summarised in Table 13.

Table 13 Summary of Key Operational Log Truck Transport Impacts - Rail

Potential Impact	Proposed Management	Potential Impact Rating	Management Impact	Cost/ Benefit Rating
Decreased traffic on identified road corridors	None	+	0	+
Decreased log truck VKT on Tasmanian road network due to utilisation of rail	None	+	0	+
Increase in rail freight movements resulting from the use of rail	Consult with DIER. Monitor all rail level crossings on haulage routes for safety. Ensure rail infrastructure is in an adequate and serviceable state.	-	+	0
Road pavement deterioration arising from increased log truck activity	Consult with DIER roads maintenance branch. Monitor roads with identified increased log truck and heavy vehicle traffic movements and upgrade as necessary.	-	0	-

6.1.3 No Rail Scenario Summary of Key Impacts

The major impacts arising from the operational phase of the proposed pulp mill when not utilising rail are summarised in Table 14.

Table 14 Summary of Key Operational Log Truck Transport Impacts – No Rail

Potential Impact	Proposed Management	Potential Impact Rating	Management Impact	Cost/ Benefit Rating
Increased log truck traffic on Frankford Main Road if rail is not utilised.	Consult with DIER traffic engineering branch. Prepare detailed route corridor assessment to ensure traffic management along corridor is adequate.	--	+	-

6.1.4 General Operational Key Transport Impacts

The major transport impacts arising from the operational phase of the proposed pulp mill are summarised in Table 15.

Table 15 Summary of General Operational Key Transport Impacts

Potential Impact	Proposed Management	Potential Impact Rating	Management Impact	Cost/ Benefit Rating
Transport of chemicals to the pulp mill.	Transport of dangerous goods must be in accordance with ADG Code and Tas DG legislation.	--	+	-
Increase in truck movements in northeast region for boiler fuel transport	Consult with DIER traffic engineering branch.	-	0	-
Increased noise along transport routes where identified truck volume increases occur	Detailed noise assessment be undertaken on identified routes	-	0	-
Decreased noise along transport routes where identified truck volume decreases occur	None	+	0	+

6.2 Conclusions

This report reviewed the original TIA as well as additional analysis as a result of submissions received regarding the project. The analysis undertaken in this expert witness statement in conjunction with the TIA component of the Draft IIS demonstrates that the changes in freight and other operational movements arising from Gunns preferred operation of the proposed pulp mill (being Anticipated Strategy, utilising the rail network for some long-haul freight of resources) would not have any substantial adverse impacts on Tasmania's road network in terms of capacity and road safety.

The adoption of this operational strategy results in an overall decrease in log truck movements across Tasmanian roads when compared to the Control Strategy, with some localised increases on some roads that remain well below their capacity.

The use of the rail network for the pulp mill will be dependent on the success of negotiations between government agencies, rail operator, and other key stakeholders/ organisations to ensure that the associated infrastructure is capable of being utilised for this purpose.

The Plantation Strategy without the use of rail provides the 'worst-case' operational strategy for the proposed pulp mill as it results in a net increase in log truck movements on Tasmania's road network, however this increase does not substantially reduce the level of service of investigated roads to unacceptable levels. The East Tamar Highway carries the highest increase in traffic in absolute terms due to it being the sole vehicular access to the pulp mill.

The Anticipated Strategy, which is Gunns preferred operational strategy generally had lesser impacts compared to the Plantation Strategy, particularly when utilising rail. The Anticipated Strategy is therefore the logical compromise between the Control and Plantation Strategies in terms of minimising on transport impacts.

Analysis of the Control Strategy (being no pulp mill) identified that an overall increase in log truck movements will result over time regardless of the construction of the proposed pulp mill.

The analysis of the traffic generation associated construction phase of the proposed pulp mill indicates that a localised increase in traffic movements (both light and heavy vehicles) will result on East Tamar Highway between the site's access and George Town. This increase also maintains an acceptable level of service for this road, although some reduction in level of service can be expected for the pulp mill access road at its junction with East Tamar Highway. Measures can be put in place to minimise the impacts for this approach to the intersection. Traffic in and around the township of George Town should be accommodated by the existing road network.

Concerns arising from numerous submissions to the Draft IIS have been investigated, and whilst some data has been revised, my opinions regarding traffic and transport have not been altered from the original TIA.

In my opinion, the proposed pulp mill at Long Reach is acceptable on traffic and transport grounds, with the preferred operational strategy being the Anticipated Strategy with the use of rail for some longhaul freight movements.

7. Provisional Opinion

The opinions that I have expressed in this report are based on my experience and the experience and advice provided to me by Gunns Limited and the consultants engaged to carry out specialist studies for the Bell Bay Pulp Mill Project. Subject to any limitations and exclusions identified in this statement, my opinions are complete and accurate in every respect.

8. Declaration

I have made all the inquiries that I believe are desirable and appropriate and no matters of significance which I regard as relevant have, to my knowledge, been withheld from the Commission.

Appendix A

Qualifications and Experience

Keith Midson

Qualifications

Bachelor of Engineering (Civil)	- University of Tasmania, 1996
Master of Traffic	- Monash University, 2004
Master of Transport	- Monash University, 2006

Professional Associations

Association	Status	Comments
Institute of Engineers Australia (IEAust)	Member	
Institute of Transportation Engineers (ITE)	Member	Australia & New Zealand Executive Board member
Institute of Public Works Engineers Australia	Member	Past executive committee member (general committee, Secretary and Vice President), Tasmania
Association of Professional Engineers, Scientists and Managers Australia (APESMA)	Member	

Conference Presentations

» Local Road Safety and Traffic Engineering Conference *(November 2006)*, Sydney

– Strip Shopping Centres, The Road Safety Dilemma

– Increased Road Safety for Strip Shopping Centres, the bigger picture for Australia

» Australian Institute of Transport Planning and Management (AITPM), 2005 annual conference, Brisbane

– Conflicts and Crashes – A Tale of Three Strip Shopping Centres

» National Parking Workshop, Newcastle 2003

– Parking as a Road Safety Tool

» Institute of Public Works Engineers Australia, Tasmanian Annual Conference, 2001, Hobart

– Reduced Urban Speed Limits

Employment History

Dates	Employer	Title	Roles
Nov 2005 to current	GHD Pty Ltd	Manager Transportation	Business Group Manager of Transportation, which includes Traffic Engineering and Transport Planning, and Roads Service Groups. Also Service Group Manager of Traffic Engineering and Transport Planning service group. Part of Tasmanian Operating Centre management team. Responsible for management and business development of a team comprising of approximately 15 professional staff.

Dates	Employer	Title	Roles
			Ongoing technical role as Senior Traffic Engineer. Project Director and/or Project Manager for following projects: » Sorell Traffic Study – DIER » Clarence Plains Outline Development Plan » Lorinna Road Engineering Assessment and Technical Review – Kentish Council. » Midland Highway Transport Study – DIER » Tasman Bridge, Review of Tidal Flow Operations – DIER » Launceston General Hospital Traffic and Parking Study » Huonville High School Traffic Management Study » Numerous Traffic Impact Assessments for large and small scale developments throughout Tasmania Other projects include: » Traffic engineering input into design of East Tamar Highway/ Batman Highway grade separated interchange » Brooker Highway transport study » Springvale Road and Burwood Highway Operational Route Management Strategies (Victoria)
Oct 2004 – Nov 2005	GHD Pty Ltd	Senior Traffic Engineer	Project Manager for following projects: » Kingston and Environs Transport Study – DIER » Droughty Point Transport Study – DIER & Others » Launceston Direction Signage – Launceston City Council » South Arm Traffic Study – Clarence City Council » Kennedy Drive Access Study - Clarence City Council » Numerous Traffic Impact Assessments for large and small scale developments throughout Tasmania
Nov 2000 – Oct 2004	Glenorchy City Council	Traffic Engineer/ Deputy Manager Roads and Recreation	Monitoring and road safety review of GCC's transport network. Countermeasure design and assessment. Traffic engineering input for various road designs and reconstructions. Management of Council's on and off street parking. Traffic engineering advice on numerous large and small scale developments, including transport depots, shopping centres, industrial, commercial and residential developments. Project manager of series of 12 Local Area Traffic Management Schemes – development and implementation. GCC Project manager for Community Road Safety Partnership Programme with DIER. Implementation of various initiatives. Deputy manager of Roads and Recreation Department from time-to-time.
2000	Ratio Consultants	Traffic Engineer	Worked on various projects, including: » City of Glenorchy Traffic Study – GCC » Sullivans Cove Pedestrian Study – HCC » Bostik factory pedestrian and road safety review – Bostik

Dates	Employer	Title	Roles
			» Glen Eira Road Safety Strategy – Glen Eira City Council » Bayside City Council Road Safety Strategy – Bayside City Council » Road Safety Black Spot Scheme assessments for various Victorian Councils » Midland Highway, Perth Bypass Transport Planning » Numerous Traffic Impact Assessments for various developments throughout Victoria
1999	Pitt and Sherry	Traffic Engineer	Worked on various projects including: » Crash analysis and countermeasure investigation, Arthur Highway – DIER » Road Safety Evaluation of Lime Kiln Point access, Lyell Highway – DIER » Road Safety Assessment of Rokeby Main Road, Butonia and Diosma Streets - DIER » Numerous Traffic Impact Assessments for various developments throughout Tasmania
1996 - 1999	Hobart City Council	Traffic Engineer	Responsible for day-to-day traffic engineering activities including: » Local Area Traffic Management Schemes – development and implementation » Crash investigations and remedial treatments » Arterial route management » Council officer responsible for traffic impact assessment of various developments » On and off street parking management » Road closure traffic management for special events

Appendix B

Truck Volumes

Summary Data

GHD

www.ghd.com.au
Tel. (03) 6210 0600 Fax. (03) 6223 8246
162 Macquarie St HOBART Tas 7000

Gunns Northern Tasmania Pulp Mill - 321170905
Truck Volumes - North East Region

Note: A positive number in the difference column denotes an increase in trucks on that particular road link, a negative value denotes a reduction.

RAIL SCENARIO			Laden and Unladen Trucks Per Day									Differences in Truck Volumes Comparing Strategies within Snapshot Timeframes							
			Startup Model Avg 2008/09			Snapshot Model 1 Avg 2013/2014/2015			Snapshot Model 2 Avg 2019/2020/2021			Control strategy for startup compared to Anticipated and plantation strategies for startup		Control strategy for startup compared to control for snapshot 1, Anticipated and plantation strategies compared control for snapshot 1			Control strategy for startup compared to control for snapshot 2, Anticipated and plantation strategies compared control for snapshot 2		
Road	ID number	Location	Control	Anticipated	Plantation	Control	Anticipated	Plantation	Control	Anticipated	Plantation	Anticipated Strategy	Plantation Strategy	Control Strategy	Anticipated Strategy	Plantation Strategy	Control Strategy	Anticipated Strategy	Plantation Strategy
North East Region												difference	difference	difference	difference	difference	difference	difference	difference
Bass Highway	44	near deloraine	78	78	78	80	80	80	76	76	76	0	0	2	0	0	-2	0	0
Bass Highway	43	near westbury	78	78	78	80	80	80	76	76	76	0	0	2	0	0	-2	0	0
Bass Highway	42	west of launceston	24	24	24	22	22	22	22	22	22	0	0	-2	0	0	-2	0	0
Batman Highway	28	near batman bridge	184	184	184	192	192	242	194	194	244	0	0	8	0	50	10	0	50
Birralee Main Road	45	south of birralee	78	78	78	80	80	80	76	76	76	0	0	2	0	0	-2	0	0
Birralee Main Road	46	north of birralee	118	118	118	126	126	126	128	128	128	0	0	8	0	0	10	0	0
Blessington Main Road	47	blessington	44	44	44	44	44	44	58	58	58	0	0	0	0	0	14	0	0
Blessington Main Road	48	near launceston	44	44	44	44	44	44	58	58	58	0	0	0	0	0	14	0	0
Bridport Main Road	35	near scottsdale	80	80	80	124	124	124	150	150	150	0	0	44	0	0	70	0	0
Bridport Main Road	34	near bridport	80	80	80	124	124	124	150	150	150	0	0	44	0	0	70	0	0
Bridport Main Road	33	west of bridport	146	146	146	188	188	188	228	228	228	0	0	42	0	0	82	0	0
Bridport Main Road	32	east of pipers river	146	146	146	188	188	188	228	228	228	0	0	42	0	0	82	0	0
Bridport Main Road	31	west of pipers river	146	146	146	188	188	188	228	228	228	0	0	42	0	0	82	0	0
Bridport Main Road	30	east of east tamar hwy turnoff	146	146	146	188	188	188	228	228	228	0	0	42	0	0	82	0	0
East Tamar Highway	29	north of batman hwy turnoff	556	556	556	544	544	620	608	608	734	0	0	-12	0	76	52	0	126
East Tamar Highway	40	south of batman hwy turnoff	354	354	354	334	334	360	390	390	466	0	0	-20	0	26	36	0	76
Esk Main Road	52	west of fingal	66	66	66	62	62	62	74	74	74	0	0	-4	0	0	8	0	0
Frankford Main Road	25	west of frankford	24	24	24	24	24	74	20	20	70	0	0	0	0	50	-4	0	50
Frankford Main Road	26	east of glengary	142	142	142	150	150	200	148	148	198	0	0	8	0	50	6	0	50
Lake Leake Main Road	58	near lake leake	0	0	0	0	0	6	0	0	10	0	0	0	0	6	0	0	10
Lilydale Main Road	103	east of rocherlea	44	44	44	50	50	50	64	64	64	0	0	6	0	0	20	0	0
Midland Highway	51	epping forrest	154	154	154	134	134	146	132	132	160	0	0	-20	0	12	-22	0	28
Midland Highway	50	perth	212	212	212	182	182	208	200	200	272	0	0	-30	0	26	-12	0	72
Midland Highway	49	north of breadalbane	212	212	212	182	182	208	200	200	272	0	0	-30	0	26	-12	0	72
Poatina Main Road	57	near miena	58	58	58	48	48	62	68	68	112	0	0	-10	0	14	10	0	44
Poatina Main Road	56	south of poatina	58	58	58	48	48	62	68	68	112	0	0	-10	0	14	10	0	44
Poatina Main Road	55	north of poatina	58	58	58	48	48	62	68	68	112	0	0	-10	0	14	10	0	44
Poatina Main Road	54	near cressy	58	58	58	48	48	62	68	68	112	0	0	-10	0	14	10	0	44
Poatina Main Road	53	south of Longford	58	58	58	48	48	62	68	68	112	0	0	-10	0	14	10	0	44
Tasman Highway	38	near derby	80	80	80	124	124	124	150	150	150	0	0	44	0	0	70	0	0
Tasman Highway	37	near branxholm	80	80	80	124	124	124	150	150	150	0	0	44	0	0	70	0	0
Tasman Highway	36	east of scottsdale	80	80	80	124	124	124	150	150	150	0	0	44	0	0	70	0	0
Wellington Street	102	city	280	280	280	248	248	274	280	280	352	0	0	-32	0	26	0	0	72
West Tamar Highway	27	south of batman hwy turnoff	162	162	162	168	168	218	170	170	220	0	0	6	0	50	8	0	50
West Tamar Highway	60	north of batman hwy turnoff	22	22	22	24	24	24	24	24	24	0	0	2	0	0	2	0	0
Gunns access road to Chip Mill/ Pulp Mill			702	702	702	732	732	808	836	836	962	0	0	30	0	76	134	0	126

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Truck Volumes - North West

Note: A positive number in the difference column denotes an increase in trucks on that particular road link, a negative value denotes a reduction.

RAIL SCENARIO			Laden and Unladen Trucks Per Day									Differences in Truck Volumes Comparing Strategies within Snapshot Timeframes							
			Startup Model Avg 2008/09			Snapshot Model 1 Avg 2013/2014/2015			Snapshot Model 2 Avg 2019/2020/2021			Control strategy for startup compared to Anticipated and plantation strategies for startup		Control strategy for startup compared to control for snapshot 1, Anticipated and plantation strategies compared control for snapshot 1			Control strategy for startup compared to control for snapshot 2, Anticipated and plantation strategies compared control for snapshot 2		
Road	ID number	Location	Control	Anticipated	Plantation	Control	Anticipated	Plantation	Control	Anticipated	Plantation	Anticipated Strategy	Plantation Strategy	Control Strategy	Anticipated Strategy	Plantation Strategy	Control Strategy	Anticipated Strategy	Plantation Strategy
North West Region																			
Bass Highway West of Burnie																			
Bass Highway	1	west of smithon	38	38	38	44	44	44	60	60	60	0	0	6	0	0	22	0	0
Bass Highway	2	east of smithton	38	38	38	44	44	44	60	60	60	0	0	6	0	0	22	0	0
Bass Highway	3	east of smithton	50	50	50	80	80	80	102	102	102	0	0	30	0	0	52	0	0
Bass Highway	4	west of wiltshire rail head	66	66	66	118	118	118	150	150	150	0	0	52	0	0	84	0	0
Bass Highway	5	east of wiltshire rail head	66	66	66	118	16	16	150	42	72	0	0	52	-102	-102	84	-108	-78
Bass Highway	6	near rocky cape	66	66	66	118	16	16	150	42	72	0	0	52	-102	-102	84	-108	-78
Bass Highway	7	near sisters creek	66	66	66	118	16	40	150	42	72	0	0	52	-102	-78	84	-108	-78
Bass Highway	8	east of boat harbour	66	66	66	118	16	40	150	42	72	0	0	52	-102	-78	84	-108	-78
Bass Highway	9	near wynyard	66	66	66	118	16	40	150	42	72	0	0	52	-102	-78	84	-108	-78
Bass Highway	10	near somerset	66	66	66	118	16	134	150	42	162	0	0	52	-102	16	84	-108	12
Bass Highway	11	east of murchison highway turnoff	66	66	66	118	16	134	150	42	162	0	0	52	-102	16	84	-108	12
Bass Highway East of Burnie																			
Bass Highway	12	east of burnie	18	18	18	22	22	10	18	18	6	0	0	4	0	-12	0	0	-12
Bass Highway	13	near penguin	18	18	18	22	22	10	18	18	6	0	0	4	0	-12	0	0	-12
Bass Highway	14	near ulverstone	18	18	18	22	22	10	18	18	6	0	0	4	0	-12	0	0	-12
Bass Highway	15	west of devonport	18	18	18	22	22	10	18	18	6	0	0	4	0	-12	0	0	-12
Guildford Hampshire Main Road	16	south of hampshire mill	10	10	10	12	12	12	12	12	12	0	0	2	0	0	2	0	0
Murchison Highway	17	south of guildford hampshire road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Murchison Highway	18	north of guildford hampshire road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Murchison Highway	19	near Hellyer gorge	56	56	56	130	130	12	144	144	54	0	0	74	0	-118	88	0	-90
Murchison Highway	20	near elliott	0	0	0	0	0	94	0	0	90	0	0	0	0	94	0	0	90
Murchison Highway	21	south of bass highway	0	0	0	0	0	94	0	0	90	0	0	0	0	94	0	0	90
Ridgley Main Road	22	near ridgley	84	84	84	140	38	78	168	50	128	0	0	56	-102	-62	84	-118	-40
Ridgley Main Road	23	north of hampshire	84	84	84	140	38	78	168	50	128	0	0	56	-102	-62	84	-118	-40
Waratah Main Road	24	south of waratah	10	10	10	12	12	12	12	12	12	0	0	2	0	0	2	0	0
Hampshire woodchip mill access			250	250	250	452	354	68	502	382	96	0	0	58	-98	-384	86	-120	-406

ave the same number of trucks entering the Hampshire mill due to the proposed Gunns strategies, however the truck link volumes differ from

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Gunns Northern Tasmania Pulp Mill - 321170905
Truck Volumes - Southern Region

Note: A positive number in the difference column denotes an increase in trucks on that particular road link, a negative value denotes a reduction.

RAIL SCENARIO			Laden and Unladen Trucks Per Day									Differences in Truck Volumes Comparing Strategies within Snapshot Timeframes							
												Control strategy for startup compared to Anticipated and plantation strategies for startup		Control strategy for startup compared to control for snapshot 1, Anticipated and plantation strategies compared control for snapshot 1			Control strategy for startup compared to control for snapshot 2, Anticipated and plantation strategies compared control for snapshot 2		
			Startup Model Avg 2008/09			Snapshot Model 1 Avg 2013/2014/2015			Snapshot Model 2 Avg 2019/2020/2021										
Road	ID number	Location	Control	Anticipated	Plantation	Control	Anticipated	Plantation	Control	Anticipated	Plantation	Anticipated Strategy	Plantation Strategy	Control Strategy	Anticipated Strategy	Plantation Strategy	Control Strategy	Anticipated Strategy	Plantation Strategy
Southern Region																			
Arthur Highway	74	north of taranna	22	22	22	20	20	16	32	32	32	0	0	-2	0	-4	10	0	0
Arthur Highway	75	north of eaglehawk neck	22	22	22	20	20	16	32	32	32	0	0	-2	0	-4	10	0	0
Arthur Highway	76	south of dunalley	22	22	22	20	20	16	32	32	32	0	0	-2	0	-4	10	0	0
Arthur Highway	77	north of dunalley	22	22	22	20	20	16	32	32	32	0	0	-2	0	-4	10	0	0
Arthur Highway	78	near copping	22	22	22	20	20	16	32	32	32	0	0	-2	0	-4	10	0	0
Arthur Highway	79	near forcett	0	0	0	0	0	4	0	0	14	0	0	0	0	4	0	0	14
Arthur Highway	80	east of sorell	0	0	0	0	0	4	0	0	14	0	0	0	0	4	0	0	14
Brooker Highway	97	near granton	122	44	44	116	8	98	106	6	42	-78	-78	-6	-108	-18	-16	-100	-64
Bruny Main Road	81	neck between south and north bruny	10	10	10	8	8	8	6	6	6	0	0	-2	0	0	-4	0	0
Bruny Main Road	82	east of the ferry access	10	10	10	8	8	8	6	6	6	0	0	-2	0	0	-4	0	0
Channel Highway	83	north of kettering	10	10	10	8	8	8	6	6	6	0	0	-2	0	0	-4	0	0
Colebrook Main Road	101	south of fingerpost main road	244	166	166	218	110	186	254	154	148	-78	-78	-26	-108	-32	10	-100	-106
Fingerpost Main Road	93	east of richmond	244	166	166	218	110	186	254	154	148	-78	-78	-26	-108	-32	10	-100	-106
Glen Huon Main Road	89	near judbury	34	78	78	32	76	34	38	62	58	44	44	-2	44	2	4	24	20
Glen Huon Main Road	90	near huonville	34	78	78	32	76	34	38	62	58	44	44	-2	44	2	4	24	20
Huon Highway	85	north of dover	78	78	78	76	76	76	62	62	62	0	0	-2	0	0	-16	0	0
Huon Highway	86	south of geevston	78	78	78	76	76	76	62	62	62	0	0	-2	0	0	-16	0	0
Huon Highway	87	north of geevston	78	78	78	76	76	76	62	62	62	0	0	-2	0	0	-16	0	0
Huon Highway	88	near franklin	78	78	78	76	76	76	62	62	62	0	0	-2	0	0	-16	0	0
Huon Highway	91	east of grove	112	34	34	108	0	90	100	0	36	-78	-78	-4	-108	-18	-12	-100	-64
Plenty Link Road (Forestry Road)	100	-	0	78	78	0	108	18	0	100	64	78	78	0	108	18	0	100	64
Lyell Highway	69	north of hamilton	110	110	110	90	90	76	130	130	86	0	0	-20	0	-14	20	0	-44
Lyell Highway	70	south of hamilton	110	110	110	90	90	76	130	130	86	0	0	-20	0	-14	20	0	-44
Lyell Highway	71	west of new norfolk	110	110	110	90	90	76	130	130	86	0	0	-20	0	-14	20	0	-44
Lyell Highway	72	east of new norfolk	110	110	110	90	90	76	130	130	86	0	0	-20	0	-14	20	0	-44
Midland Highway	73	north of bridgewater	232	154	154	206	98	182	236	136	152	-78	-78	-26	-108	-24	4	-100	-84
Midland Highway	98	south of campbell town	0	0	0	0	0	6	0	0	18	0	0	0	0	6	0	0	18
Southern Outlet	92	north of kingston	122	44	44	116	8	98	106	6	42	-78	-78	-6	-108	-18	-16	-100	-64
Macquarie Street	99	city	122	44	44	116	8	98	106	6	42	-78	-78	-6	-108	-18	-16	-100	-64
Tasman Highway	64	near Buckland	276	198	198	246	138	204	294	194	156	-78	-78	-30	-108	-42	18	-100	-138
Tasman Highway	63	south of Orford	276	198	198	246	138	204	294	194	156	-78	-78	-30	-108	-42	18	-100	-138
Tasman Highway	62	triabunna	52	52	52	40	40	34	46	46	34	0	0	-12	0	-6	-6	0	-12
Triabunna Chip Mill Access		Tribaunna	350	272	272	306	198	254	372	272	208	-78	-78	-44	-108	-52	22	-100	-164
Tea Tree Secondary Road	95	east of brighton	232	154	154	206	98	182	236	136	150	-78	-78	-26	-108	-24	4	-100	-86
Tea Tree Secondary Road	94	west of colebrook main road	244	166	166	218	110	186	254	154	148	-78	-78	-26	-108	-32	10	-100	-106
Wielengta Road (Forestry owned road)	96	south of Orford	22	22	22	20	20	16	32	32	18	0	0	-2	0	-4	10	0	-14

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Gunns Northern Tasmania Pulp Mill - 321170905
Truck Volumes Per Day - North East Region

Note: A positive number in the difference column denotes an increase in trucks on that particular road link, a negative value denotes a reduction.

NO RAIL SCENARIO			Laden and Unladen Trucks Per Day									Differences in Truck Volumes Comparing Strategies within Snapshot Timeframes							
			Startup Model Avg 2008/09			Snapshot Model 1 Avg 2013/2014/2015			Snapshot Model 2 Avg 2019/2020/2021			Control strategy for startup compared to Anticipated and plantation strategies for startup		Control strategy for startup compared to control for snapshot 1, Anticipated and plantation strategies compared control for snapshot 1			Control strategy for startup compared to control for snapshot 2, Anticipated and plantation strategies compared control for snapshot 2		
Road	ID Number	Location	Control	Anticipated	Plantation	Control	Anticipated	Plantation	Control	Anticipated	Plantation	Anticipated Strategy	Plantation Strategy	Control Strategy	Anticipated Strategy	Plantation Strategy	Control Strategy	Anticipated Strategy	Plantation Strategy
North East Region												difference	difference	difference	difference	difference	difference	difference	difference
Bass Highway	44	near deloraine	78	78	78	80	80	80	76	76	76	0	0	2	0	0	-2	0	0
Bass Highway	43	near westbury	78	78	78	80	80	80	76	76	76	0	0	2	0	0	-2	0	0
Bass Highway	42	west of launceston	24	24	24	22	22	22	22	22	22	0	0	-2	0	0	-2	0	0
Batman Highway	28	near batman bridge	184	184	184	192	294	580	194	312	476	0	0	8	102	388	10	118	282
Birralee Main Road	45	south of birralee	78	78	78	80	80	80	76	76	76	0	0	2	0	0	-2	0	0
Birralee Main Road	46	north of birralee	118	118	118	126	126	126	128	128	128	0	0	8	0	0	10	0	0
Blessington Main Road	47	blessington	44	44	44	44	44	44	58	58	58	0	0	0	0	0	14	0	0
Blessington Main Road	48	near launceston	44	44	44	44	44	44	58	58	58	0	0	0	0	0	14	0	0
Bridport Main Road	35	near scottsdale	80	80	80	124	124	124	150	150	150	0	0	44	0	0	70	0	0
Bridport Main Road	34	near bridport	80	80	80	124	124	124	150	150	150	0	0	44	0	0	70	0	0
Bridport Main Road	33	west of bridport	146	146	146	188	188	188	228	228	228	0	0	42	0	0	82	0	0
Bridport Main Road	32	east of pipers river	146	146	146	188	188	188	228	228	228	0	0	42	0	0	82	0	0
Bridport Main Road	31	west of pipers river	146	146	146	188	188	188	228	228	228	0	0	42	0	0	82	0	0
Bridport Main Road	30	east of east tamar hwy turnoff	146	146	146	188	188	188	228	228	228	0	0	42	0	0	82	0	0
East Tamar Highway	29	north of batman hwy turnoff	556	634	634	544	754	984	608	826	1054	78	78	-12	210	440	52	218	446
East Tamar Highway	40	south of batman hwy turnoff	354	432	432	334	442	386	390	490	554	78	78	-20	108	52	36	100	164
Esk Main Road	52	west of fingal	66	66	66	62	62	62	74	74	74	0	0	-4	0	0	8	0	0
Frankford Main Road	25	west of frankford	24	24	24	24	126	412	20	138	302	0	0	0	102	388	-4	118	282
Frankford Main Road	26	east of glengary	142	142	142	150	252	538	148	266	430	0	0	8	102	388	6	118	282
Lake Leake Main Road	58	near lake leake	0	0	0	0	0	6	0	0	10	0	0	0	0	6	0	0	10
Lilydale Main Road	103	east of rocherlea	44	44	44	50	50	50	64	64	64	0	0	6	0	0	20	0	0
Midland Highway	51	epping forrest	154	232	232	134	242	172	132	232	252	78	78	-20	108	38	-22	100	120
Midland Highway	50	perth	212	290	290	182	290	234	200	300	364	78	78	-30	108	52	-12	100	164
Midland Highway	49	north of breadalbane	212	290	290	182	290	234	200	300	364	78	78	-30	108	52	-12	100	164
Poatina Main Road	57	near miena	58	58	58	48	48	62	68	68	112	0	0	-10	0	14	10	0	44
Poatina Main Road	56	south of poatina	58	58	58	48	48	62	68	68	112	0	0	-10	0	14	10	0	44
Poatina Main Road	55	north of poatina	58	58	58	48	48	62	68	68	112	0	0	-10	0	14	10	0	44
Poatina Main Road	54	near cressy	58	58	58	48	48	62	68	68	112	0	0	-10	0	14	10	0	44
Poatina Main Road	53	south of Longford	58	58	58	48	48	62	68	68	112	0	0	-10	0	14	10	0	44
Tasman Highway	38	near derby	80	80	80	124	124	124	150	150	150	0	0	44	0	0	70	0	0
Tasman Highway	37	near branxholm	80	80	80	124	124	124	150	150	150	0	0	44	0	0	70	0	0
Tasman Highway	36	east of scottsdale	80	80	80	124	124	124	150	150	150	0	0	44	0	0	70	0	0
Wellington Street	102	city	280	358	358	248	356	300	280	380	444	78	78	-32	108	52	0	100	164
West Tamar Highway	27	south of batman hwy turnoff	162	162	162	168	270	556	170	288	452	0	0	6	102	388	8	118	282
West Tamar Highway	60	north of batman hwy turnoff	22	22	22	24	24	24	24	24	24	0	0	2	0	0	2	0	0
Gunns access road to Chip Mill/ Pulp Mill			702	780	780	732	942	1172	836	1054	1282	78	78	30	210	440	134	218	446

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Truck Volumes Per Day - North West Region

Note: A positive number in the difference column denotes an increase in trucks on that particular road link, a negative value denotes a reduction.

NO RAIL SCENARIO			Laden and Unladen Trucks Per Day									Differences in Truck Volumes Comparing Strategies within Snapshot Timeframes							
												Control strategy for startup compared to Anticipated and plantation strategies for startup		Control strategy for startup compared to control for snapshot 1, Anticipated and plantation strategies compared control for snapshot 1			Control strategy for startup compared to control for snapshot 2, Anticipated and plantation strategies compared control for snapshot 2		
			Startup Model Avg 2008/09			Snapshot Model 1 Avg 2013/2014/2015			Snapshot Model 2 Avg 2019/2020/2021										
Road	ID Number	Location	Control	Anticipated	Plantation	Control	Anticipated	Plantation	Control	Anticipated	Plantation	Anticipated Strategy	Plantation Strategy	Control Strategy	Anticipated Strategy	Plantation Strategy	Control Strategy	Anticipated Strategy	Plantation Strategy
North West Region																			
Bass Highway West of Burnie																			
Bass Highway	1	west of smithon	38	38	38	44	44	44	60	60	60	0	0	6	0	0	22	0	0
Bass Highway	2	east of smithton	38	38	38	44	44	44	60	60	60	0	0	6	0	0	22	0	0
Bass Highway	3	east of smithton	50	50	50	80	80	80	102	102	102	0	0	30	0	0	52	0	0
Bass Highway	4	west of wiltshire rail head	66	66	66	118	118	118	150	150	150	0	0	52	0	0	84	0	0
Bass Highway	5	east of wiltshire rail head	66	66	66	118	118	118	150	150	150	0	0	52	0	0	84	0	0
Bass Highway	6	near rocky cape	66	66	66	118	118	118	150	150	150	0	0	52	0	0	84	0	0
Bass Highway	7	near sisters creek	66	66	66	118	118	142	150	150	150	0	0	52	0	24	84	0	0
Bass Highway	8	east of boat harbour	66	66	66	118	118	142	150	150	150	0	0	52	0	24	84	0	0
Bass Highway	9	near wynyard	66	66	66	118	118	142	150	150	150	0	0	52	0	24	84	0	0
Bass Highway	10	near somerset	66	66	66	118	118	236	150	150	240	0	0	52	0	118	84	0	90
Bass Highway	11	east of murchison highway turnoff	66	66	66	118	118	236	150	150	240	0	0	52	0	118	84	0	90
Bass Highway East of Burnie																			
Bass Highway	12	east of burnie	18	18	18	22	124	348	18	136	238	0	0	4	102	326	0	118	220
Bass Highway	13	near penguin	18	18	18	22	124	348	18	136	238	0	0	4	102	326	0	118	220
Bass Highway	14	near ulverstone	18	18	18	22	124	348	18	136	238	0	0	4	102	326	0	118	220
Bass Highway	15	west of devonport	18	18	18	22	124	348	18	136	238	0	0	4	102	326	0	118	220
Guildford Hampshire Main Road	16	south of hampshire mill	10	10	10	12	12	12	12	12	12	0	0	2	0	0	2	0	0
Murchison Highway	17	south of guildford hampshire road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Murchison Highway	18	north of guildford hampshire road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Murchison Highway	19	near Hellyer gorge	56	56	56	130	130	12	144	144	54	0	0	74	0	-118	88	0	-90
Murchison Highway	20	near elliott	0	0	0	0	0	94	0	0	90	0	0	0	0	94	0	0	90
Murchison Highway	21	south of bass highway	0	0	0	0	0	94	0	0	90	0	0	0	0	94	0	0	90
Ridgley Main Road	22	near ridgley	84	84	84	140	38	78	168	50	128	0	0	56	-102	-62	84	-118	-40
Ridgley Main Road	23	north of hampshire	84	84	84	140	38	78	168	50	128	0	0	56	-102	-62	84	-118	-40
Waratah Main Road	24	south of waratah	10	10	10	12	12	12	12	12	12	0	0	2	0	0	2	0	0
Hampshire woodchip mill access			250	250	250	452	354	68	502	382	96	0	0	58	-98	-384	86	-120	-406

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Gunns Northern Tasmania Pulp Mill - 321170905
Truck Volumes Per Day - Southern Region

Note: A positive number in the difference column denotes an increase in trucks on that particular road link, a negative value denotes a reduction.

NO RAIL SCENARIO			Laden and Unladen Trucks Per Day									Differences in Truck Volumes Comparing Strategies within Snapshot Timeframes							
			Startup Model Avg 2008/09			Snapshot Model 1 Avg 2013/2014/2015			Snapshot Model 2 Avg 2019/2020/2021			Control strategy for startup compared to Anticipated and plantation strategies for startup		Control strategy for startup compared to control for snapshot 1, Anticipated and plantation strategies compared control for snapshot 1			Control strategy for startup compared to control for snapshot 2, Anticipated and plantation strategies compared control for snapshot 2		
Road	ID Number	Location	Control	Anticipated	Plantation	Control	Anticipated	Plantation	Control	Anticipated	Plantation	Anticipated Strategy	Plantation Strategy	Control Strategy	Anticipated Strategy	Plantation Strategy	Control Strategy	Anticipated Strategy	Plantation Strategy
Southern Region																			
Arthur Highway	74	north of taranna	22	22	22	20	20	16	32	32	32	0	0	-2	0	-4	10	0	0
Arthur Highway	75	eaglehawk neck	22	22	22	20	20	16	32	32	32	0	0	-2	0	-4	10	0	0
Arthur Highway	76	south of dunalley	22	22	22	20	20	16	32	32	32	0	0	-2	0	-4	10	0	0
Arthur Highway	77	north of dunalley	22	22	22	20	20	16	32	32	32	0	0	-2	0	-4	10	0	0
Arthur Highway	78	near copping	22	22	22	20	20	16	32	32	32	0	0	-2	0	-4	10	0	0
Arthur Highway	79	near forcett	0	0	0	0	0	4	0	0	14	0	0	0	0	4	0	0	14
Arthur Highway	80	east of sorell	0	0	0	0	0	4	0	0	14	0	0	0	0	4	0	0	14
Brooker Highway	97	near granton	122	122	122	116	116	116	106	106	106	0	0	-6	0	0	-16	0	0
Bruny Main Road	81	neck between south and north bruny	10	10	10	8	8	8	6	6	6	0	0	-2	0	0	-4	0	0
Bruny Main Road	82	east of the ferry access	10	10	10	8	8	8	6	6	6	0	0	-2	0	0	-4	0	0
Channel Highway	83	north of kettering	10	10	10	8	8	8	6	6	6	0	0	-2	0	0	-4	0	0
Colebrook Main Road	101	south of fingerpost main road	244	166	166	218	110	186	254	154	148	-78	-78	-26	-108	-32	10	-100	-106
Fingerpost Main Road	93	east of richmond	244	166	166	218	110	186	254	154	148	-78	-78	-26	-108	-32	10	-100	-106
Glen Huon Main Road	89	near judbury	34	34	34	32	32	32	38	38	38	0	0	-2	0	0	4	0	0
Glen Huon Main Road	90	near huonville	34	34	34	32	32	32	38	38	38	0	0	-2	0	0	4	0	0
Huon Highway	85	north of dover	78	78	78	76	76	76	62	62	62	0	0	-2	0	0	-16	0	0
Huon Highway	86	south of geevston	78	78	78	76	76	76	62	62	62	0	0	-2	0	0	-16	0	0
Huon Highway	87	north of geevston	78	78	78	76	76	76	62	62	62	0	0	-2	0	0	-16	0	0
Huon Highway	88	near franklin	78	78	78	76	76	76	62	62	62	0	0	-2	0	0	-16	0	0
Huon Highway	91	east of grove	112	112	112	108	108	108	100	100	100	0	0	-4	0	0	-12	0	0
Plenty Link Road (Forestry Road)	100	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lyell Highway	69	north of hamilton	110	110	110	90	90	76	130	130	86	0	0	-20	0	-14	20	0	-44
Lyell Highway	70	south of hamilton	110	110	110	90	90	76	130	130	86	0	0	-20	0	-14	20	0	-44
Lyell Highway	71	west of new norfolk	110	110	110	90	90	76	130	130	86	0	0	-20	0	-14	20	0	-44
Lyell Highway	72	east of new norfolk	110	110	110	90	90	76	130	130	86	0	0	-20	0	-14	20	0	-44
Midland Highway	73	north of bridgewater	232	232	232	206	206	192	236	236	192	0	0	-26	0	-14	4	0	-44
Midland Highway	98	south of campbell town	0	78	78	0	108	32	0	100	108	78	78	0	108	32	0	100	108
Southern Outlet	92	north of kingston	122	122	122	116	116	116	106	106	106	0	0	-6	0	0	-16	0	0
Macquarie Street	68	city	122	122	122	116	116	116	106	106	106	0	0	-6	0	0	-16	0	0
Tasman Highway	64	near Buckland	276	198	198	246	138	204	294	194	156	-78	-78	-30	-108	-42	18	-100	-138
Tasman Highway	63	south of Orford	276	198	198	246	138	204	294	194	156	-78	-78	-30	-108	-42	18	-100	-138
Tasman Highway	62	triabunna	52	52	52	40	40	34	46	46	34	0	0	-12	0	-6	-6	0	-12
Triabunna Chip Mill Access		Tribaunna	350	272	272	306	198	254	372	272	208	-78	-78	-44	-108	-52	22	-100	-164
Tea Tree Secondary Road	95	east of brighton	232	154	154	206	98	182	236	136	150	-78	-78	-26	-108	-24	4	0	-86
Tea Tree Secondary Road	94	west of colebrook main road	244	166	166	218	110	186	254	154	148	-78	-78	-26	-108	-32	10	-100	-106
Wielengta Road (Forestry owned road)	96	south of Orford	22	22	22	20	20	16	32	32	18	0	0	-2	0	-4	10	0	-14

Appendix C

Boiler Fuel Data

Laden Vehicles

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Gunns - Northern Tasmania Pulp Mill
Boiler Fuel Residue Transport Summary

One-way distances from origin to pulp mill.

Chip Mills	Mill distance	Centroid distance	trucks per day	Trucks per year
WK	8	70	0.22	52.8
DM	10	20	0.54	129.6
DM	10	20	2.01	482.4
DM	10	20	2.83	679.2
WK	30	70	2.32	556.8
DM	10	20	1.49	357.6
BL	40	160	2.14	513.6
LL	40	110	0.64	153.6
BL	38	160	1.49	357.6
BL	43	160	1.09	261.6
BL	38	160	0.37	88.8
BL	38	160	2.23	535.2
BL	51	160	1.18	283.2
BL	43	160	0.06	14.4
BL	54	160	0.54	129.6
BL	54	160	0.07	16.8
LZ	110	160	0.29	69.6
M7	86	130	1.09	261.6
NG	220	60	0.68	163.2
NG	220	60	0.62	148.8

Zones	Centroid d	trucks per day	Trucks per year
BL	160	2.63	631.2
CB	210	2.63	631.2
DM	20	2.63	631.2
DT	160	2.63	631.2
FG	320	2.63	631.2
HI	350	2.63	631.2
LL	110	2.63	631.2
LZ	160	2.63	631.2
M7	130	2.63	631.2
M8	270	2.63	631.2
MQ	220	2.63	631.2
RV	100	2.63	631.2
SN	230	2.63	631.2
SQ	190	2.63	631.2
SZ	250	2.63	631.2
TR	44	2.63	631.2
WK	74	2.63	631.2

Appendix D

Vehicles Kilometres Travelled

Revised Data

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3212970 - Gunns Pulp Mill:
Vehicle Kilometres travelled by trucks generated from each region
Truck volume totals generated from each region

RAIL SCENARIO

Daily Data (veh.km)

	Startup			Snapshot 1			Snapshot 2		
	Control	Anticipated	Plantation	Control	Anticipated	Plantation	Control	Anticipated	Plantation
South	52,101	44,395	44,395	45,900	34,780	45,750	53,830	43,450	52,150
Northwest	17,930	17,930	17,930	31,550	22,370	29,380	29,030	25,800	33,910
Northeast	71,240	71,240	71,240	74,060	74,060	74,060	85,280	85,280	85,280
Total	141,271	133,565	133,565	151,510	131,210	149,190	168,140	154,530	171,340

Daily Data (trucks)

	Startup			Snapshot 1			Snapshot 2		
	Control	Anticipated	Plantation	Control	Anticipated	Plantation	Control	Anticipated	Plantation
South	350	350	350	306	306	306	372	372	372
Northwest	250	250	250	452	452	452	500	500	500
Northeast	702	702	702	732	732	732	836	836	836
Total	1,302	1,302	1,302	1,490	1,490	1,490	1,708	1,708	1,708

Yearly Data (veh.km based on trucks operating 240 days of the year)

	Startup			Snapshot 1			Snapshot 2		
	Control	Anticipated	Plantation	Control	Anticipated	Plantation	Control	Anticipated	Plantation
South	12,504,348	10,654,891	10,654,891	11,016,000	8,347,200	10,980,000	12,919,200	10,428,000	12,516,000
Northwest	4,303,200	4,303,200	4,303,200	7,572,000	5,368,800	7,051,200	6,967,200	6,192,000	8,138,400
Northeast	17,097,600	17,097,600	17,097,600	17,774,400	17,774,400	17,774,400	20,467,200	20,467,200	20,467,200
Total	33,905,148	32,055,691	32,055,691	36,362,400	31,490,400	35,805,600	40,353,600	37,087,200	41,121,600
Difference		-1,849,457	-1,849,457		-4,872,000	-556,800		-3,266,400	768,000

Yearly Data (trucks based on 240 days of operation)

	Startup			Snapshot 1			Snapshot 2		
	Control	Anticipated	Plantation	Control	Anticipated	Plantation	Control	Anticipated	Plantation
South	84,000	84,000	84,000	73,440	73,440	73,440	89,280	89,280	89,280
Northwest	60,000	60,000	60,000	108,480	108,480	108,480	120,000	120,000	120,000
Northeast	168,480	168,480	168,480	175,680	175,680	175,680	200,640	200,640	200,640
Total	312,480	312,480	312,480	357,600	357,600	357,600	409,920	409,920	409,920

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3212970 - Gunns Pulp Mill:
Vehicle Kilometres travelled by trucks generated from each region
Truck volume totals generated from each region

NO RAIL SCENARIO

	Daily Data (veh.km)								
	Startup			Snapshot 1			Snapshot 2		
	Control	Anticipated	Plantation	Control	Anticipated	Plantation	Control	Anticipated	Plantation
South	52,101	63,505	63,505	45,900	61,560	51,960	53,830	68,330	73,470
Northwest	17,930	17,930	17,930	31,550	43,280	80,590	29,030	49,970	61,410
Northeast	71,240	71,240	71,240	74,060	74,060	74,060	85,280	85,280	85,280
Total	141,271	152,675	152,675	151,510	178,900	206,610	168,140	203,580	220,160

	Daily Data (trucks)								
	Startup			Snapshot 1			Snapshot 2		
	Control	Anticipated	Plantation	Control	Anticipated	Plantation	Control	Anticipated	Plantation
South	350	350	350	306	306	306	372	372	372
Northwest	250	250	250	452	452	452	500	500	500
Northeast	702	702	702	732	732	732	836	836	836
Total	1,302	1,302	1,302	1,490	1,490	1,490	1,708	1,708	1,708

	Yearly Data (veh.km based on trucks operating 240 days of the year)								
	Startup			Snapshot 1			Snapshot 2		
	Control	Anticipated	Plantation	Control	Anticipated	Plantation	Control	Anticipated	Plantation
South	12,504,348	15,241,291	15,241,291	11,016,000	14,774,400	12,470,400	12,919,200	16,399,200	17,632,800
Northwest	4,303,200	4,303,200	4,303,200	7,572,000	10,387,200	19,341,600	6,967,200	11,992,800	14,738,400
Northeast	17,097,600	17,097,600	17,097,600	17,774,400	17,774,400	17,774,400	20,467,200	20,467,200	20,467,200
Total	33,905,148	36,642,091	36,642,091	36,362,400	42,936,000	49,586,400	40,353,600	48,859,200	52,838,400
Difference		2,736,943	2,736,943		6,573,600	13,224,000		8,505,600	12,484,800

	Yearly Data (trucks based on 240 days of operation)								
	Startup			Snapshot 1			Snapshot 2		
	Control	Anticipated	Plantation	Control	Anticipated	Plantation	Control	Anticipated	Plantation
South	84,000	84,000	84,000	73,440	73,440	73,440	89,280	89,280	89,280
Northwest	60,000	60,000	60,000	108,480	108,480	108,480	120,000	120,000	120,000
Northeast	168,480	168,480	168,480	175,680	175,680	175,680	200,640	200,640	200,640
Total	312,480	312,480	312,480	357,600	357,600	357,600	409,920	409,920	409,920

Appendix E

East Tamar Log Truck Volumes

Gunns Nothern Tasmania Pulp Mill
East Tamar Highway Traffic Volumes - Mill access to Batman Hwy

	Startup (2008/09)			Snapshot 1 (2013-2015)			Snapshot 2 (2019-2021)		
RAIL	Control Strategy	Anticipated Strategy	Plantation Strategy	Control Strategy	Anticipated Strategy	Plantation Strategy	Control Strategy	Anticipated Strategy	Plantation Strategy
Light vehicles - entry	105	275	275	105	275	275	105	275	275
Light vehicles - exit	105	275	275	105	275	275	105	275	275
Laden logtrucks	556	556	556	544	544	620	608	608	734
Unladen log trucks	556	556	556	544	544	620	608	608	734
Laden chemical trucks	0	5	5	0	5	5	0	5	5
Unladen chemical trucks	0	5	5	0	5	5	0	5	5
Boiler fuel trucks	0	20	20	0	20	20	0	20	20
Unladen boiler fuel trucks	0	20	20	0	20	20	0	20	20
TOTAL	**1322**	**1712**	**1712**	**1298**	**1688**	**1840**	**1426**	**1816**	**2068**
Difference from Control		**390**	**390**		**390**	**542**		**390**	**642**

	Startup (2008/09)			Snapshot 1 (2013-2015)			Snapshot 2 (2019-2021)		
No Rail	Control Strategy	Anticipated Strategy	Plantation Strategy	Control Strategy	Anticipated Strategy	Plantation Strategy	Control Strategy	Anticipated Strategy	Plantation Strategy
Light vehicles - entry	105	275	275	105	275	275	105	275	275
Light vehicles - exit	105	275	275	105	275	275	105	275	275
Laden logtrucks	556	634	634	544	754	984	608	826	1054
Unladen log trucks	556	634	634	544	754	984	608	826	1054
Laden chemical trucks	0	5	5	0	5	5	0	5	5
Unladen chemical trucks	0	5	5	0	5	5	0	5	5
Boiler fuel trucks	0	20	20	0	20	20	0	20	20
Unladen boiler fuel trucks	0	20	20	0	20	20	0	20	20
TOTAL	**1322**	**1868**	**1868**	**1298**	**2108**	**2568**	**1426**	**2252**	**2708**
Difference from Control		**546**	**546**		**810**	**1270**		**826**	**1282**

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