

# Chapter 15

# Transport



This chapter discusses the potential transport impacts associated with the construction and operation of the Gas Import Jetty and Pipeline Project (the Project). This chapter is based on the impact assessment presented in EES Technical Report J: *Transport impact assessment*.

## 15.1 Overview

The development and operation of the Project may result in changes to the transport network and traffic conditions within the Project Area. The operation of the transport network in a safe and efficient manner is crucial to how a community travels through its neighbourhood and how people, goods and services move around.

Identifying and understanding the potential transport impacts of the Project that have a risk of adversely affecting road users, the community and businesses is essential in reducing the level of disruption. During construction, potential transport impacts may affect travel routines and create safety risks for those who live and work within the Project Area. It is also important to understand any resulting changes to the transport network once the Project was operating.

Minimising impacts on the functionality, operation and safety of the transport network during the Project's construction and operation would be key to ensuring road users and local communities can continue to travel safely and efficiently.

## 15.2 EES evaluation objective

The scoping requirements for the EES set out the following relevant draft evaluation objectives:

**Energy efficiency, security, affordability and safety – To provide for safe and cost-effective augmentation of Victoria's natural gas supply in the medium to longer term.**

**Social, economic, amenity and land use – To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.**

To assess the potential effects of the Project on transport networks and traffic conditions, a transport impact assessment was undertaken (see ESS Technical Report J: *Transport impact assessment*).

### 15.3 Methodology

The approach adopted for the transport impact assessment involved the following key tasks:

- a review of relevant Commonwealth, state and local legislation and policy
- a desktop review of relevant baseline data and reports, including network jurisdictions and classifications
- site-based assessment of the roads within the study area
- characterisation of existing transport networks and traffic conditions through analysis of traffic data, road safety data, bus routes and designated heavy vehicle routes and restrictions
- consultation with regulatory bodies and key stakeholders including VicRoads, Mornington Peninsula Shire, City of Casey and Cardinia Shire Council to discuss key transport issues that may arise from the Project
- a risk assessment as described in **Chapter 5** Key approvals assessment framework to inform the impact assessment and development of additional mitigation measures
- assessment of transport impacts during construction and operation of the Project
- development of mitigation measures in response to the transport impact assessment.

### 15.4 Study area

The study area for the transport impact assessment is shown in **Figure 15-1** and was divided into seven segments. The study area includes declared roads and local roads that may be impacted by the construction and/or operation of the Project.

### 15.5 Existing conditions

The assessment of existing conditions characterises and summarises the existing road network, traffic conditions and findings from the desktop review and site inspections in the study area.



#### Declared road classification

Declared roads are classified as Freeways, Arterial Roads and Non-Arterial Roads. The declared road network is under management and operation by VicRoads, and are categorised into four classes; M, A, B and C. Each class reflects the function and quality of the roads within the network and has a minimum set of physical standards in regard to the width of lanes and shoulders, number of lanes, shoulder surface type and traffic volumes.

**M** – Roads are duplicated freeways or expressways connecting the capital cities and major provincial centres, and linking major centres of production with Victoria's export terminals;

**A** – Roads are two-lane two-way roads which serve the same role as M roads but carry less traffic.

**B** – Roads provide the primary link between major regions not served by A roads, and also highly significant tourism regions.

**C** – Roads provide the more important links between other centres of populations, and between these centres and the primary transport network.

#### 15.5.1 Declared road network

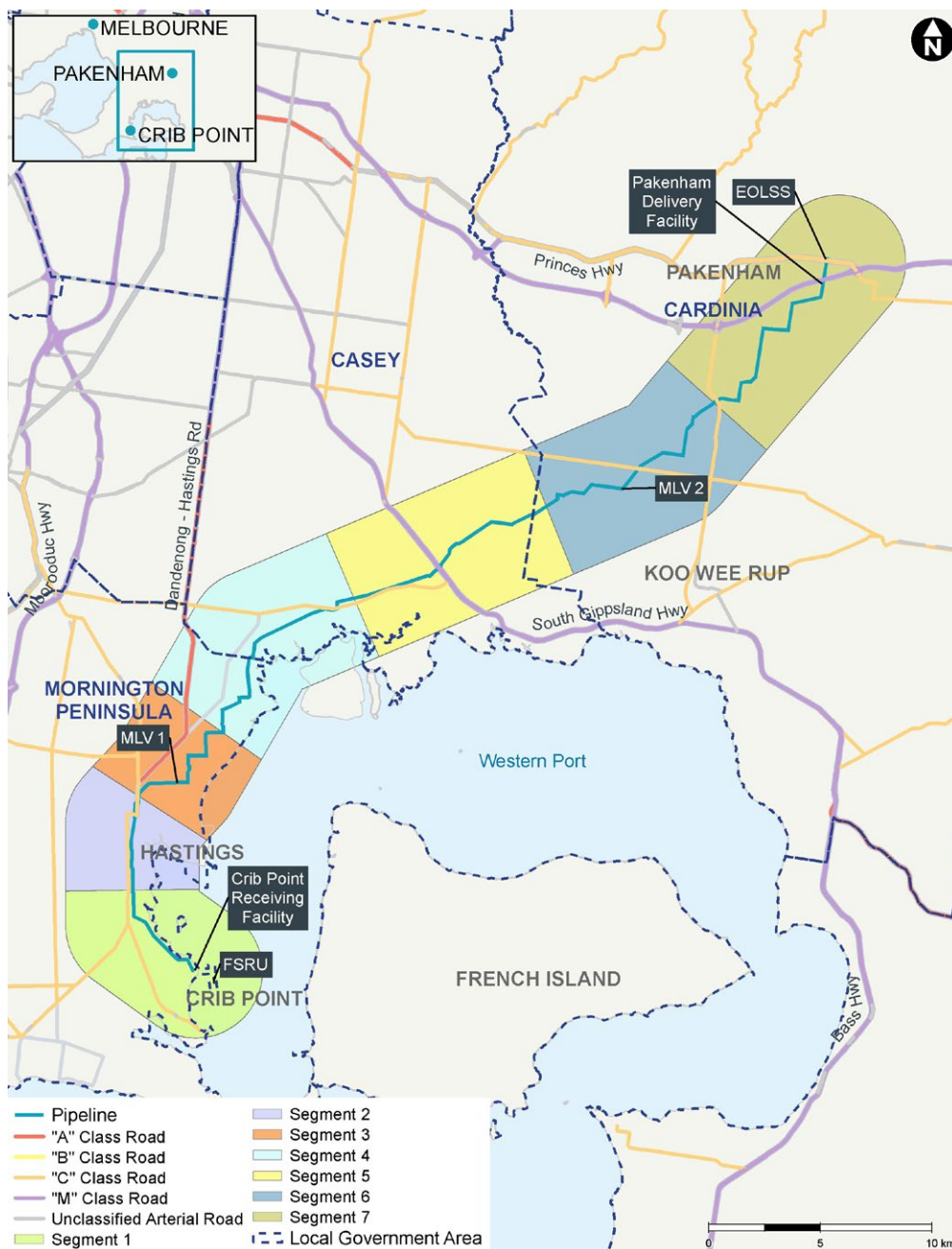
Under the Road Management Act 2004, declared roads are classified as Freeways, Arterial Roads and Non-Arterial State Roads. Generally, the declared roads within the study area meet the VicRoads cross-section and seal width requirements. The following roads are included in the declared road network within the study area:

- Stony Point Road
- Frankston–Flinders Road
- Baxter–Tooradin Road
- Dandenong–Hastings Road
- Ballarto Road
- Healesville–Koo Wee Rup Road
- Koo Wee Rup Road
- Rossiter Road
- Princes Highway
- South Gippsland Highway
- Nar Nar Goon Road
- Western Port Highway.

Three planned road upgrade proposals that might be impacted by the Project have been identified during consultation with VicRoads:

- Healesville–Koo Wee Rup Road in Pakenham South – planned to start in late 2020
- Frankston–Flinders Road in Hastings.
- Baxter–Tooradin Road, Devon Meadows/Cannons Creek – completion expected in 2020

It is estimated the Healesville-Koo Wee Rup Road upgrade would coincide with the Project construction, but the Frankston–Flinders Road upgrade is only in the planning stages and yet to be a committed project. Installing safety features along Baxter–Tooradin Road between Fisheries Road and South Gippsland Highway is planned to reduce the risk of collisions and improve road safety. Works are currently underway and are expected to be completed in late 2020.



15.5.2 Local road network

Local roads fall under the responsibility of the local councils Cardinia Shire Council, the City of Casey and Mornington Peninsula Shire. Primarily local roads provide connections between traffic routes and abutting land uses as well as circulation routes within local networks.

Within the northern section of the study area many local roads are situated on poorly drained and low lying land on the old Koo Wee Rup swamp. Several drainage gullies that are likely to be filled with soft silts and clays are present in this area, which are likely to be of low bearing strength. This area also experiences cool and wet winters, which can lead to degradation of the road conditions throughout certain periods of the year, particularly through flooding.

15.5.3 B-double, higher mass limits and oversize over mass vehicles

The National Heavy Vehicle Regulator (NHVR) outlines access for B-double and higher mass limits (HML) trucks on road networks. HML classification enables certain heavy vehicles to access additional mass entitlements and allows for a significant increase in the productivity of road freight transport vehicles.

Local roads within the study area that are restricted for B-double and HML vehicles are:

- Tooradin Station Road, Tooradin
- Dalmore Road, Dalmore
- Manks Road, Cardinia
- Marine Parade, Hastings (HML restricted only).

During construction, over-dimensional loads would likely be used to transport large equipment to the Project Area. For the movement of oversize loads, the NHVR outlines the necessary requirements and provides dimensional limits depending on vehicle types. HML and B-double vehicle operators must obtain permits from the road manager to operate on any roads which are not a part of the approved networks. Further permission is required from the Department of Transport if any of these over dimensional vehicles are required to cross train tracks which are at grade level.

15.5.4 Traffic volumes

Most of the roads within the study area are within the local road network. Existing traffic volumes have been estimated for these roads based on their respective road classification. The traffic volumes based on road classification are conservative in nature and expected to exceed the actual observable traffic volumes on each.

Overall, traffic volumes for the local road network are low compared with the declared road network, ranging from about 500 vehicles to approximately 7,000 vehicles per day.



What are B-double, higher mass limits and oversize over mass vehicles?

**Oversize over mass vehicles** – a heavy vehicle or combination which alone, or together with its load, exceeds prescribed mass or dimension requirements and is carrying a large indivisible item.

**Higher mass limits (HML)** – allow particular heavy vehicles to access additional mass entitlements providing drivers are accredited, vehicles are fitted with certified road friendly suspension, and that vehicles are on an authorised HML route.

**B-double** – a class 2 heavy vehicle that consists of a prime mover towing two semitrailers. A B-double must comply with prescribed mass and dimension requirements. Typical B-doubles range from 19 to 25 metres in length depending on the number of axles.

The Project is also expected to use several declared roads, some of which accommodate higher daily traffic volumes. Of the declared roads identified, the Princes Freeway was recorded to have the highest number of vehicles with an Annual Average Daily Traffic (AADT) of 13,000 vehicles. Annual Average Daily Traffic (seven-day average) is a measure of traffic demand that represents the total volume of vehicle traffic passing a given point on a road in a year divided by 365 days.

**Table 15-1** shows the traffic volumes of local roads. **Table 15-2** summarises traffic volumes of declared roads within the study area. Traffic volume data was provided by VicRoads.

Consideration of seasonal variation in traffic conditions and volumes is important in understanding the future performance of the declared road network. Traffic profiles vary daily depending on the day of the week, as there is a noticeable difference between peak volumes on weekdays and weekends.

Given the Project Area includes the popular holiday destination of the Mornington Peninsula Shire, traffic volume is predicted to increase in these areas during most of the summer months. During this time, the Mornington Peninsula population can double from an estimated 150,000 to 300,000. It is to be noted that seasonal variation in Hastings is not as high as other areas in Mornington Peninsula and so traffic volumes might be approximately 20 per cent higher in summer in the vicinity of the Project. Casey and Cardinia shires do not experience a large seasonal variation in traffic volumes on roads within the study area.



**Table 15-1:** Summary of local road traffic volumes

Road name	Location	Standardised road classification	AADT*	Location of highest volume
The Esplanade	Mornington Peninsula Shire	Urban collector	430	North and south of Crib Point Jetty
Reid Parade	Mornington Peninsula Shire	Urban collector	3,300	Between Railway Crescent and James Hird Drive
Graydens Road	Mornington Peninsula Shire	Urban arterial	6,000	Between Boes Road and Watts Road
Whitneys Road	Mornington Peninsula Shire	Rural local	690	Between Tyabb–Tooradin Road and Lumeah Road
Tyabb Tooradin Road	Mornington Peninsula Shire	Rural arterial	7,100	Between Bungower Road and Bembridge Road
Bungower Road	Mornington Peninsula Shire	Rural arterial	3,400	Between Lower Somerville Road and Dandenong–Hastings Road
Bald Hill Road	Cardinia Shire	Rural arterial	1,500	Between Ryan Road and Coop Road

\*A growth factor of three per cent has been applied to account for growth between the count year and 2019

**Table 15-2:** Summary of declared road traffic volumes

Road name	Class	AADT*	Heavy vehicle percentage	Location of highest volume
Stony Point Road	C	3,300	2% (80)	Between Frankston–Flinders Road and Woolleys Road
Frankston–Flinders Road	C	7,900	29% (500)	Between High Street and Frankston–Flinders Road/ Watts Road Between Graydens Road and Hodgins Road
Baxter–Tooradin Road	C	4,700	9% (430)	Between Larnach Road and Cannons Creek Road
Dandenong–Hastings Road	A	6,700	8% (540)	Between The Crescent And Frankston–Flinders Rd
Ballarto Road	C	840	11% (90)	Between Clyde-Five Ways Road and Koo Wee Rup Road
Healesville–Koo Wee Rup Road	C	6,300	16% (1000)	Between Racecourse Road and Ballarto Road
Koo Wee Rup Road	C	4,300	16% (678)	Between Ballarto Road and Manks Road
Rossiter Road	C	1,500	11% (160)	Near South Gippsland Highway
Princes Highway	C	2,800	7% (200)	Between Princes Freeway East and Dore Road
Princes Freeway	M	13,000	14% (1,800)	Between Koo Wee Rup Road and Nar Nar Goon Road
South Gippsland Highway	A	7,100–8,800	11–20% (780–1,760)	Between Tooradin Station Road and Baxter–Tooradin Road
Nar Nar Goon Road	C	1,500	10% (150)	Between Princes Freeway East and Carney Street
Western Port Highway	A	6,700–10,000	9–12% (460–990)	Between Cranbourne Road and North Road

\*Annual Average Daily Traffic (seven-day average)

### 15.5.5 Crash analysis

Using the VicRoads Crash Stats database from 2013 to 2017 a crash analysis within the study area was undertaken. The analysis showed six locations where five or more crashes had occurred within the five-year period. The six study intersections have all had more than five crashes in the one location, but no recorded fatalities have been recorded and none of the crashes involved pedestrians. **Figure 15-2** shows the location of the six study intersections. This increased concentration of crashes in Hastings can be attributed to higher density of traffic volumes and additional exposure of motorists to conflicting movements at intersections. These are both typical characteristics of developed urban areas such as Hastings.

### 15.5.6 Bus routes

Metropolitan and regional bus routes exist within the study area and generally use declared roads. Bus service 782 runs through Hastings along High Street and along several roads within the study area, including:

- Stony Point Road
- Woolleys Road
- Frankston–Flinders Road (between Stony Point Road and Hodgins Road)
- Hodgins Road (between Marine Parade and Wallaroo Place)
- Frankston–Flinders (between Graydens Road/ Marine Parade and Western Port Highway).

Bus service 783 also runs through Hastings along the following roads within the study area, including:

- Hodgins Road (between Marine Parade and Wallaroo Place)
- Frankston–Flinders (between Graydens Road/ Marine Parade and Western Port Highway).

These lines operate from 5:30 am to 10 pm on weekdays and are scheduled approximately every hour. School buses are also common throughout each of the municipalities, mostly within built up areas.

There is a bus line that operates near the Koo Wee Rup laydown area where pipe and equipment storage areas are expected to be located. This bus service operates from Pakenham to Koo Wee Rup via Rossiter Road and Koo Wee Rup Road and runs from 7 am to 6 pm on weekdays, approximately seven times a day.

### 15.5.7 Level crossings

The following train lines exist within the vicinity of the study area:

- Stony Point Line (Metro) – operates between Frankston and Stony Point railway stations
- Gippsland Line (V-Line) – operates between Southern Cross and Bairnsdale railway stations.

Trains run approximately every 90 minutes on the Stony Point Line during peak and off-peak hours. The Gippsland line runs five services between Southern Cross and Bairnsdale on weekdays, and operates services between Southern Cross and Traralgon approximately every 60 minutes. Within the study area there are nine level crossings present along the proposed pipeline alignment:

- Stony Point Road, between Frankston–Flinders Road and Seaglades Lane
- Frankston–Flinders Road, between Reid Parade and Lady Nelson Parkway
- Reid Parade, between Frankston–Flinders Road and Railway Crescent
- High Street, between Arthur Street and Plymouth Street
- Cool Store Road, between Wallis Drive and Ranklin Road
- Hodgins Road, between Wallis Drive and Penhurst Avenue
- Frankston–Flinders Road, between Kanowa Street and Marine Parade
- Frankston–Flinders Road, between Denham Road and Marin Parade
- Oakview Lane, between Bald Hill Road and Princes Freeway.

### 15.5.8 Pedestrians and cyclists

Discussions with Mornington Peninsula Shire, Cardinia Shire Council and the City of Casey determined there is no significant pedestrian and cycling activity in the vicinity of the Project. However, within Hastings pedestrians and cyclists were frequently observed on High Street during site investigations. These levels are expected to increase during summer and school holidays.

**Figure 15-2:**  
Crashes in the last five years within the study area



## 15.6 Risk assessment

The risk assessment identified the risks associated with transport and traffic impacts of Project's construction and operation. In accordance with the method described in **Chapter 5** Key approvals and assessment framework. These considered the environmental, social, economic and health and safety consequences of each risk and their likelihood of occurring.

Transport risks associated with construction and operation of the Project are summarised in **Table 15-3**. Nine risks have been identified that are associated with construction of the Project, with three of these risks rated medium following implementation of appropriate mitigation. The remaining construction risks have been assigned a rating of low. Three risks have been identified for the operation of the Project: one risk rated as medium and two risks rated as low.

Risk ratings were applied to each of the identified risk pathways in **Table 15-3** assuming that initial mitigation measures were in place. Where the initial risk ratings were categorised as medium or higher, additional mitigation measures were developed to lower the residual risk where possible. A complete risk register, including the likelihood and consequence of each risk pathway is located in EES Attachment III: *Environmental risk report*.

The identified transport risks are further discussed in **Section 15.7** (Construction impacts) and **Section 15.8** (Operation impacts) of this chapter. Mitigation measures for transport impacts are presented in **Section 15.10** (Mitigation measures) of this chapter and in **Chapter 25** *Environmental Management Framework*.

**Table 15-3:** Transport risks

Risk ID	Works area	Risk pathway	Initial mitigation measures	Initial risk rating	Additional mitigation measures	Residual risk rating
<b>Construction</b>						
TP1	Gas Import Jetty Works and Pipeline Works	Additional traffic during construction may result in increased congestion exceeding level of service D, and ultimately compromising road safety within the vicinity of the Project Area	<b>MM-TP01</b> Traffic Management Plan	Low	No additional mitigation measures identified	Low
TP2	Pipeline Works	Road/lane closures in Hastings result in impacts on business operation and access	<b>MM-TP01</b> Traffic Management Plan <b>MM-TP03</b> Stakeholder consultation on transport changes	Medium	Pipeline alignment change to Stony Point rail corridor in accordance with mitigation measure listed in <b>Chapter 19</b> Business (MM-BU01)	Low
TP3*	Gas Import Jetty Works and Pipeline Works	Public roads experience deterioration in the quality of the pavement due to the movement of heavy vehicles, machinery and plant	<b>MM-TP01</b> Traffic Management Plan <b>MM-TP05</b> Pavement strength survey – Pavement rehabilitation Road integrity surveillance Regular meetings with authorities	Medium	<b>MM-TP05</b> Pavement strength survey – Upgraded pavement for Woolleys Road and the Esplanade (subject to the pavement strength survey results)	Low



Risk ID	Works area	Risk pathway	Initial mitigation measures	Initial risk rating	Additional mitigation measures	Residual risk rating
TP4	Gas Import Jetty Works and Pipeline Works	Plant and spoil trucks deposit construction debris on public roads leading to dust generation and perceived loss of amenity and public health and safety issues	<b>MM-TP01</b> Traffic Management Plan – dust and debris management strategies  <b>MM-TP03</b> Stakeholder consultation on transport changes	Medium	<b>MM-TP01</b> Traffic Management Plan – Monitor condition of roads.  Dust suppression methods in accordance with mitigation measures listed in <b>Chapter 12</b> Air quality (MM-AQ01 and MM-AQ05)	Low
TP5	Gas Import Jetty Works and Pipeline Works	Additional project generated traffic and construction works impact pedestrians and cyclists resulting in a reduction in public safety and amenity.  Increased safety risk to school children in school zones, walking to/ from school and school crossings in the impacted area	<b>MM-TP01</b> Traffic Management Plan – Pedestrian and cyclist connectivity  <b>MM-TP03</b> Stakeholder consultation on transport changes	Medium	Pipeline alignment change to Stony Point rail corridor in accordance with mitigation measures listed in <b>Chapter 19</b> Business (MM-BU01)	Low
TP6	Gas Import Jetty Works and Pipeline Works	Movement of pipes, plant and heavy machinery as well as potential road closures impacts on public transport safety and access for school buses	<b>MM-TP06</b> Public Transport Disruption Management sub-plan  <b>MM-TP03</b> Stakeholder consultation on transport changes – PTV and local schools	Medium	<b>MM-TP01</b> Traffic Management Plan - Avoid truck (pipeline and other activities) movements in Hastings between school hours (7:30 to 9 am and 2:30 to 4 pm) and avoid school zone areas, where possible  Driver induction to inform driver requirements from outcomes of the Public Transport Disruption Management sub-plan.	Medium
TP7	Pipeline Works	Road/lane closures outside of Hastings due to Pipeline Works (along road due to narrow ROW and across roads due to open cut trenching) impacting access to properties	<b>MM-TP01</b> Traffic Management Plan  <b>MM-TP03</b> Stakeholder consultation on transport changes	Medium	<b>MM-TP01</b> Traffic Management Plan – Construction activities to occur in off-peak periods when demands are low. Minimise the number and duration of road closures	Low

Risk ID	Works area	Risk pathway	Initial mitigation measures	Initial risk rating	Additional mitigation measures	Residual risk rating
TP8	Pipeline Works	Risk of crash at intersection of access track and public road due to non-complying sight lines, stopping distance and lack of lighting	<b>MM-TP01</b> Traffic Management Plan <b>MM-TP04</b> Road Safety Audit	High	<b>MM-TP04</b> Road Safety Audit – minor relocation of non-compliant access tracks to achieve conforming sight distance requirements <b>MM-TP01</b> Traffic Management Plan – Provide flag lighting during active access track use.	Medium
TP9	Pipeline Works	Crash with a train at a level crossing due to increased traffic activity and new access tracks	<b>MM-TP01</b> Traffic Management Plan – route options analysis for construction vehicles	High	<b>MM-TP02</b> Level Crossing Audit – identify required measures to conform to safety standards	Medium
<b>Operation</b>						
TP10*	Gas Import Jetty Works and Pipeline Works	Roads experience pavement deterioration due to the movement of nitrogen trucks (up to 900/year for 20 years) especially along Woolleys Road and the Esplanade (not B-double approved)	<b>MM-TP07</b> Nitrogen Transport Plan <b>MM-TP05</b> Pavement strength survey	Medium	<b>MM-TP03</b> Stakeholder consultation on transport changes – Regular meetings with Mornington Peninsula Shire to agree and confirm pavement upgrades of impacted local roads around Crib Point. Upgrade pavement of impacted local roads, subject to the pavement strength survey results	Low
TP11*	Gas Import Jetty Works	Transport of nitrogen in B-doubles (up to 900/year for 20 years) through Frankston Flinders Road increase the crash risk with road users (vehicles, buses, pedestrians and cyclists), impacting amenity and traffic operations in Hastings town centre	<b>MM-TP07</b> Nitrogen Transport Plan	High	<b>MM-TP07</b> Nitrogen Transport Plan – Using alternatives roads to bypass Hastings and Somerville town centre	Medium
TP12	Gas Import Jetty Works and Pipeline Works	Additional traffic during operation may result in increased congestion exceeding level of service D, and ultimately compromising road safety within the vicinity of the Project Area.	No initial mitigation measures identified	Low	No additional mitigation measures identified	Low

\* Note: the Traffic Management Plan and Nitrogen Transport Plan in conjunction with pavement strength survey will verify the final designated truck access route can be supported by the roads it travels.

## 15.7 Construction impacts

This section discusses the potential traffic impacts of the Project's construction including impacts on road links and intersections, road infrastructure, intersection safety and public transport.

### 15.7.1 Construction traffic volumes for assessment

An increase in traffic volumes is expected during the peak of construction activity on several roads in the study area. Increases in traffic volumes due to construction traffic would generally be short in duration (one to three weeks) due to the progressive nature of the pipeline construction. Construction at the Crib Point Receiving Facility and the Pakenham Delivery Facility would occur over a longer period, up to 18 to 27 months, with resultant extended durations of increases in traffic volumes. In addition, pipeline construction in Hastings would progress slower than in less urban areas with associated increases in traffic volumes over a longer period, up to 10 months.

The values identified in this section are representative of the busiest period at the peak of construction under a conservative evaluation scenario, with the movements anticipated to be an estimated maximum.

The main reason for the anticipated additional traffic is due to the construction workforce, which is expected to reach approximately 400 people at the peak of the pipeline's construction. Concurrent activities could lead to a total of 800 movements per day during peak periods of construction activities. However, most of the pipeline construction activities would not occur at the same time and are anticipated to occur in a specific construction sequence. Less workers would be required on site for most of the construction. It is anticipated that 120 workers would be required on average during the pipeline's construction. Approximately 50 personnel would also be required on site each day for the Pakenham Delivery Facility's construction.

An estimated 90 personnel would be required on-site each day for construction of the Gas Import Jetty Works. On-site parking would be provided to accommodate construction worker vehicles which would be outlined in the Traffic Management Plan (see mitigation measure MM-TP01). Alternative transport arrangements such as shuttles would likely be used to reduce overall traffic impacts of construction workers arriving and departing. Daily heavy vehicle movements are anticipated during the construction peak for the Crib Point and Pakenham facilities. However, these vehicles are not expected to generate movements outside the vicinity of the construction site.

Existing AADT traffic volumes and AADT traffic volumes that include predicted return trips for all roads anticipated to be used during construction are provided in **Table 15-4**.

Construction workforce numbers and the distribution of the construction workforce across project construction worksites means that construction traffic volumes would generally be lower than those used for the transport impact assessment.

**Table 15-4:** Estimated daily traffic generation during the peak of construction activity (includes return trips)

Roads	Municipality	Road authority	Existing AADT volumes*	Existing AADT volumes and construction traffic
Woolleys Road	Mornington Peninsula Shire	Mornington Peninsula Shire	3,000	4100
The Esplanade	Mornington Peninsula Shire	Mornington Peninsula Shire	400	1600
Seaglades Lane	Mornington Peninsula Shire	Mornington Peninsula Shire	500	1300
Stony Point Road	Mornington Peninsula Shire	VicRoads	3,300	4300
Frankston Flinders Road	Mornington Peninsula Shire	VicRoads	7,900	9000
Reid Parade	Mornington Peninsula Shire	Mornington Peninsula Shire	3,300	4100
High Street	Mornington Peninsula Shire	Mornington Peninsula Shire	3,500	4300
Cool Store Road	Mornington Peninsula Shire	Mornington Peninsula Shire	500	1300
Kanowna Street	Mornington Peninsula Shire	Mornington Peninsula Shire	500	1300
Graydens Road	Mornington Peninsula Shire	Mornington Peninsula Shire	6,000	6800
Hodgins Road	Mornington Peninsula Shire	Mornington Peninsula Shire	3,000	3800
Dandenong-Hastings Road	Mornington Peninsula Shire	VicRoads	6,700	7800
Denham Road	Mornington Peninsula Shire	Mornington Peninsula Shire	500	2100
Whitneys Road	Mornington Peninsula Shire	Mornington Peninsula Shire	700	1500
McKirdys Road	Mornington Peninsula Shire	Mornington Peninsula Shire	500	1400
Pikes Road	Mornington Peninsula Shire	Mornington Peninsula Shire	500	1300
Tyabb Tooradin Road	Mornington Peninsula Shire	Mornington Peninsula Shire	7,100	7900
Bungower Road	Mornington Peninsula Shire	Mornington Peninsula Shire	3,400	4200
South Boundary Road East	Mornington Peninsula Shire	Mornington Peninsula Shire	3,000	3800
Western Port Highway	Mornington Peninsula Shire	VicRoads	10,000	11,400
Callanans Lane	City of Casey	City of Casey	500	1,300
Vowell Drive	City of Casey	City of Casey	500	1,300
Craigs Road	City of Casey	City of Casey	3,000	3,800
Craigs Lane	City of Casey	City of Casey	500	1,300
Baxter-Tooradin Road	City of Casey	City of Casey	4,700	6,000
Healesville-Koo Wee Rup Road	City of Casey	VicRoads	6,300	7,100
Koo Wee Rup Road	City of Casey	VicRoads	4,300	5,500
Rossiter Road	City of Casey	VicRoads	2,200	3,400
Fisheries Road	City of Casey	City of Casey	3,000	3,800
South Gippsland Highway	City of Casey	VicRoads	8,800	10,000
Adeneys Road	City of Casey	City of Casey	3,000	3,800
Lynes Road	City of Casey	City of Casey	500	1,300
Manks Road	City of Casey	City of Casey	3,000	3,900
Muddy Gates Lane	City of Casey	City of Casey	500	1,300
Tooradin Station Road	City of Casey	City of Casey	3,000	3,800



Roads	Municipality	Road authority	Existing AADT volumes*	Existing AADT volumes and construction traffic
Dalmore Road	Cardinia Shire Council	Cardinia Shire Council	3,000	3,800
Ballarto Road	Cardinia Shire Council	VicRoads	800	1,900
Soldiers Road	Cardinia Shire Council	Cardinia Shire Council	500	1,300
McGregors Road	Cardinia Shire Council	Cardinia Shire Council	500	1,300
McDonalds Drain Road	Cardinia Shire Council	Cardinia Shire Council	500	1,400
Princes Highway	Cardinia Shire Council	VicRoads	2,800	3,700
Bald Hill Road	Cardinia Shire Council	VicRoads	1,500	4,000
Princes Freeway	Cardinia Shire Council	VicRoads	13,000	1,3900
Oakview Lane	Cardinia Shire Council	Cardinia Shire Council	500	1,500
Mt Ararat Road South	Cardinia Shire Council	Cardinia Shire Council	500	1,300
Mt Ararat Road North	Cardinia Shire Council	Cardinia Shire Council	500	1,300
Nar Nar Goon Road	Cardinia Shire Council	VicRoads	1,500	2,300

## 15.7.2 Road link and intersection capacity (Risk ID TP1 and TP2)

The level of service (LOS) of roads within the study area was analysed to assess the cumulative impacts of the traffic generated by the Project's construction on overall traffic operating conditions. This was measured based on calculating volume-to-capacity (V/C) ratios and maximum service flow rates as shown below in **Table 15-5**. Typically, LOS D is considered the limit of acceptable traffic performance.

The road link analysis results are shown in **Table 15-6**. Most roads within the study area would operate as LOS C or better with only one road, Frankston–Flinders Road, expected to operate at LOS D which is still within the limit of acceptable performance. The road link analysis is based on conservative values and typical days are anticipated to perform at improved service levels. It should also be noted that impacts to traffic operations during construction would represent a temporary condition, and not be permanent.

**Table 15-5:** Level of service indicators for surface roads

Level of service	V/C ratio	Flow conditions	
A	0.0 – 0.34	Free flow operations	Uncongested flow conditions
B	0.35 – 0.50	Reasonably free flow operations	Uncongested flow conditions
C	0.50 – 0.74	Stable operations	Uncongested flow conditions
D	0.75 – 0.90	Bordering on unstable operations	Uncongested flow conditions
E	0.90 – 0.99	Extremely unstable flow operations	Near capacity flow conditions
F	1.00 or >	Forced or breakdown operation	Congested flow conditions
		Incident situation operation	Congested flow conditions

**Table 15-6:** Anticipated level of service during peak of construction activity (peak hour)

Impacted roads	Municipality	Existing V/C ratio	Existing LOS	Anticipated V/C ratio	Anticipated LOS
Woolleys Road	Mornington Peninsula Shire	0.250	A	0.342	A
The Esplanade	Mornington Peninsula Shire	0.036	A	0.130	A
Seaglades Lane	Mornington Peninsula Shire	0.042	A	0.110	A
Stony Point Road	Mornington Peninsula Shire	0.275	A	0.358	B
Frankston–Flinders Road	Mornington Peninsula Shire	0.658	C	0.753	D
Reid Parade	Mornington Peninsula Shire	0.275	A	0.342	A
High Street	Mornington Peninsula Shire	0.292	A	0.358	B
Cool Store Road	Mornington Peninsula Shire	0.042	A	0.108	A
Kanowna Street	Mornington Peninsula Shire	0.042	A	0.108	A
Graydens Road	Mornington Peninsula Shire	0.498	B	0.569	C
Hodgins Road	Mornington Peninsula Shire	0.250	A	0.317	A
Dandenong–Hastings Road	Mornington Peninsula Shire	0.560	C	0.648	C
Denham Road	Mornington Peninsula Shire	0.042	A	0.176	A
Whitneys Road	Mornington Peninsula Shire	0.057	A	0.126	A
McKirdys Road	Mornington Peninsula Shire	0.042	A	0.115	A
Pikes Road	Mornington Peninsula Shire	0.042	A	0.112	A
Tyabb Tooradin Road	Mornington Peninsula Shire	0.592	C	0.661	C

Impacted roads	Municipality	Existing V/C ratio	Existing LOS	Anticipated V/C ratio	Anticipated LOS
Bungower Road	Mornington Peninsula Shire	0.283	A	0.353	B
South Boundary Road East	Mornington Peninsula Shire	0.250	A	0.319	A
Western Port Highway	Mornington Peninsula Shire	0.417	B	0.473	B
Callanans Lane	City of Casey	0.042	A	0.110	A
Vowell Drive	City of Casey	0.042	A	0.110	A
Craigs Road	City of Casey	0.250	A	0.317	A
Craigs Lane	City of Casey	0.042	A	0.109	A
Baxter–Tooradin Road	City of Casey	0.392	B	0.503	C
Healesville–Koo Wee Rup Road	City of Casey	0.525	C	0.592	C
Koo Wee Rup Road	City of Casey	0.358	B	0.455	B
Rossiter Road	City of Casey	0.183	A	0.280	A
Fisheries Road	City of Casey	0.250	A	0.317	A
South Gippsland Highway	City of Casey	0.367	B	0.416	B
Adeneys Road	City of Casey	0.250	A	0.319	A
Lynes Road	City of Casey	0.042	A	0.110	A
Manks Road	City of Casey	0.250	A	0.323	A
Muddy Gates Lane	City of Casey	0.042	A	0.108	A
Tooradin Station Road	City of Casey	0.250	A	0.319	A
Dalmore Road	Cardinia Shire Council	0.250	A	0.320	A
Ballarto Road	Cardinia Shire Council	0.070	A	0.157	A
Soldiers Road	Cardinia Shire Council	0.042	A	0.111	A
McGregors Road	Cardinia Shire Council	0.042	A	0.108	A
McDonalds Drain Road	Cardinia Shire Council	0.042	A	0.121	A
Princes Highway	Cardinia Shire Council	0.117	A	0.152	A
Bald Hill Road	Cardinia Shire Council	0.125	A	0.331	A
Princes Freeway	Cardinia Shire Council	0.542	C	0.578	C
Oakview Lane	Cardinia Shire Council	0.042	A	0.121	A
Mt Ararat Road South	Cardinia Shire Council	0.042	A	0.113	A
Mt Ararat Road North	Cardinia Shire Council	0.042	A	0.110	A
Nar Nar Goon Road	Cardinia Shire Council	0.125	A	0.193	A

The performance of an intersection can be affected when generated construction traffic creates significant additional traffic volumes during peak periods. Several critical intersections have been identified that have potential to be impacted by the Project's construction traffic. These intersections are located along Frankston–Flinders Road, as these locations accommodate significant existing traffic volumes.

Level of service and degree of saturation have been used to determine how these key intersections will perform under the anticipated traffic conditions, including the additional traffic generated by construction activity. **Table 15-7** summarises the existing LOS and volume to capacity (V/C) ratio and the anticipated LOS and V/C ratios for these critical intersections. Projected impacts on intersection performance are expected to be minimal as LOS is projected to remain within the threshold of acceptable performance, being LOS D.

### 15.7.3 Road network infrastructure (Risk ID TP3)



In addition to assessing the performance and LOS of roads within the study area, the suitability of roads to manage traffic movements was assessed. This assessment was based on existing road cross sections, anticipated traffic volumes and site observations. Relevant VicRoads design guidelines were also consulted. For the assessment, most declared roads were categorised as Preferred Regional Routes, although sections of Frankston–Flinders Road within Hastings were categorised as Alternate Regional Routes due to safety issues associated with truck movements in a densely populated urban environment. Only two local roads have been categorised as ‘Inappropriate for Use’: Whitneys Road (between Lumeah Road and Yaringa Road) and Mt Ararat North Road.

Most movements associated with over-dimensional loads would occur during construction. A route audit would be undertaken to assess route options, safety and clearance to potential obstructions where required. This may involve undertaking pavement strength surveys before construction started to determine the suitability of roads to accommodate projected heavy vehicles (see mitigation measure MM-TP05). Given the existing standardised policies and processes and the low number of expected over-dimensional trips, any impacts are expected to be minor.

#### Preferred Regional Routes and Alternative Regional Routes

**Preferred Regional Routes** – Declared roads designed for the regional movement of people and goods. Generally satisfy cross section design requirements and have no significant road pavement or infrastructure issues, and no observed road safety issues.

**Alternative Regional Routes** – Declared roads designed for the regional movement of people and goods that may have; some sections of road that do not satisfy cross section requirements, some significant sections of poor road pavement or infrastructure issues, or some minor road safety issues observed.

Table 15-7: Frankston–Flinders Road intersection performance summary during peak period

Intersection	Existing V/C ratio	Existing LOS	Anticipated V/C ratio	Anticipated LOS
Frankston–Flinders Road/Stony Point Road	0.528	C	0.62	C
Frankston–Flinders Road/High Street	0.32	A	0.37	B
Frankston–Flinders Road/Hodgins Road	0.55	C	0.57	C
Frankston–Flinders Road/Graydens Road	0.55	C	0.63	C
Frankston–Flinders Road/Marine Parade	0.54	C	0.54	C
Frankston–Flinders Road/Dandenong–Hastings Road/Denham Road	0.63	C	0.78	D



#### 15.7.4 Intersection safety (Risk ID TP8, TP9)

Safe Intersection Sight Distance (SISD) was assessed within the study area. The 2017 Austroads Guide to Road Design Part 4a states the design requirements for cars are 181 metres, 214 metres and 248 metres for posted speed limits of 80 kilometres per hour (km/hr), 90 km/hr and 100 km/hr respectively. Most access tracks that meet the public road network satisfy these design requirements. However, 11 construction access track intersections do not comply. A Road Safety Audit would be undertaken once the proposed construction access tracks are finalised to ensure safe vehicle movements (see mitigation measure MM-TP04).

Given that some construction traffic movements may occur during night-time, it is necessary to consider the potential requirements for roadway lighting at intersections between construction access tracks and the road network. There is currently no street lighting in the vicinity, which could increase the risks of collisions in isolated rural intersections where anticipated construction traffic movements would be entering and egressing the ROW in high-speed areas. This is particularly a concern in areas where the SISD requirements are not met. Construction management measures would be implemented such as advanced warning signage and appropriate line markings at all intersections when the access track is in use. Where SISD requirements were not met, flag lighting would be undertaken during active use of the access track (see mitigation measure MM-TP01).

#### 15.7.5 Transport impacts during road closures (Risk ID TP2 and TP7)

Several short-term road and lane closures would be required during the pipeline's construction. It is anticipated that 14 roads would require temporary closure for a maximum duration of 48 hours during construction activities. These are local roads with low traffic volumes and provide access to up to 12 local properties and businesses. Measures would be implemented so that access to affected properties and businesses was maintained at all times.

Due to constraints along the Esplanade near Crib Point, the ROW is expected to encroach upon the road reducing the two-way, two-lane road to one lane during the pipeline's construction. It is anticipated the Esplanade would still perform to Level of Service A even with one lane closed and temporary signals in place. However, although the road is not over capacity, some delays may be expected during peak periods due to the introduction of temporary traffic signals.

Initial design of the pipeline alignment involved trenching along Frankston–Flinders Road in Hastings, which would have resulted in impacts from roads closures and restricted access to pedestrians and vehicles. To minimise these impacts, the alignment was revised to re-locate the alignment in the Stony Point rail corridor using horizontal directional drilling (HDD). Furthermore, with the additional mitigation of using HDD in the rail corridor, amenity impacts on sensitive receptors in Hastings would be further reduced (see mitigation measure MM-BU01 in **Chapter 19 Business**). The Traffic Management Plan (TMP) would aim to reduce the impact of road closures on the transport network by developing suitable route options for construction vehicles that minimise the use of local roads and maintain connectivity for road and footpath users (see mitigation measure MM-TP01). Stakeholder consultation with affected residents and businesses would be undertaken before works started to provide advanced warning of any temporary road closures (see mitigation measure MM-TP03). Traffic surveys would be included as part of the TMP to understand local traffic volumes at locations where road closures may occur, so that construction could occur without disruption to businesses.

### 15.7.6 Impacts on public transport (Risk ID TP6)

Bus route 782 and 783 would be impacted with potential delays, route detours and temporary closures of bus stops during construction. All other metropolitan and regional bus routes which the pipeline would traverse are on roads which would be bored under and so no impacts would occur to these services.

There is also an increased crash risk with school and public buses due to interactions with plant and heavy machinery and non-conforming intersection layouts. Impacts on public transport would be managed through the Public Transport Disruption Management sub-plan of the TMP which would aim to minimise the disruptions to the network (see mitigation measure MM-TP01). Consultation with Public Transport Victoria (PTV) and local schools would help manage the potential safety risks associated with the movement of heavy vehicles and machinery along bus routes (see mitigation measure MM-TP03).

Additionally, truck movements (pipeline and other activities) in Hastings would be avoided at school pick up and drop off times (generally from 7:30 to 9 am and 2:30 to 4 pm) where possible. At the start of the Project, truck drivers would be on-boarded and undertake driver training to make them aware of desired travel routes, driving times and other aspects included within the Public Transport Disruption Management sub-plan.

Interactions between construction vehicles and buses would increase along the Pakenham–Koo Wee Rup PTV bus route, although these interactions are anticipated to have negligible impacts in terms of bus operation and safety.

### 15.7.7 Pedestrian and cycling impacts (Risk ID TP5)

Construction activities are expected to have a minimal impact on pedestrian and cyclist connectivity within Hastings. The risk of crashes may increase if measures are not implemented to provide safe, convenient and continuous pedestrian and cyclist alternatives particularly at locations where road closures are anticipated.

Appropriate traffic management and communication protocols would be incorporated in the TMP to minimise/mitigate potential impacts on pedestrian and cyclist connectivity. These include providing adequate notice to affected residents and ensuring continuous alternative detour routes are in place (see mitigation measure MM-TP01).

### 15.7.8 Dust impact on the road network (Risk ID TP4)

Construction activities associated with the Project are expected to generate dust deposits from vehicle movements and earthworks. The deposition of dust and debris may be an inconvenience and could impact the quality of road networks and nearby residential dwellings. Key construction activities expected to generate dust include the transport of spoiled and excavated material off-site, vehicle movements on gravel roads and the mobilisation of plant and equipment.

To minimise potential impacts from dust, mitigation measures aimed at reducing the level of dust would be implemented. These include dust suppression techniques such as water sprays and the covering of construction vehicles with potential for loss of loads when using public roads (see mitigation measures MM-AQ01 and MM-AQ05 in **Chapter 12 Air quality**).

### 15.7.9 Level crossings (Risk ID TP9)

All at-grade level crossings within the study area, except for the informal level crossing on Frankston–Flinders Road between Reid Parade and Lady Nelson Parkway are considered suitable for construction traffic movement. This is because they provide adequate sight distances and active controls such as roadside warning equipment. The informal level crossing would still be used by construction traffic, with an audit to be undertaken to determine the degree of upgrade for the crossing.

## 15.8 Operation impacts

This section discusses the potential traffic impacts of the Project's operation, including impacts on road links and intersections and the overall road network

### 15.8.1 Traffic volumes

Maintenance of the gas pipeline and facilities at Crib Point would lead to small volumes of intermittent traffic movements for an expected 20-year period.

For the purpose of this assessment, it was assumed the FSRU workforce would live on board the ship. However, to conduct a conservative assessment of potential impacts on the road network during operation, it was assumed that 36 employees would travel to the site; 50 per cent from Melbourne and 50 per cent from local areas. The roads expected to be impacted are Woolleys Road, The Esplanade, Stony Point Road and Frankston–Flinders Road.

An estimated maximum of 900 trucks per year would be required to provide the liquid nitrogen for the preparation of a rich LNG shipment. Nitrogen deliveries would occur at frequent intervals throughout the year to the Crib Point Receiving Facility. During these periods, it is anticipated that up to five truck deliveries would occur daily (10 two-way movements) with the potential for two trucks to be located at the facility at one time. Odorant deliveries originating from inner Melbourne would depend on the volume of gas vaporised by the FSRU and is not expected to be more frequent than every two months.

The Nitrogen Transport Plan would manage these potential traffic impacts by identifying preferred routes, implementing management measures at key intersections and identifying permit requirements for access roads that are not B-double approved (see mitigation measure MM-TP01). A recommended route for truck deliveries has been identified via Mornington Peninsula Freeway, Frankston–Flinders Road and Coolart Road. A pavement strength survey would also be undertaken to determine if Woolleys Road and the Esplanade are fit to accommodate the projected heavy vehicles (see mitigation measure MM-TP05).

While no operational workforce movements would occur for the pipeline, daily routine corridor inspections are anticipated to monitor the pipeline easement for any operational or maintenance issues. These light vehicle movements occurring once a day along certain sections of the proposed pipeline alignment have been used as a conservative estimate for the purpose of this impact assessment.

The total anticipated vehicle movements for the Project's operating phase are summarised in **Table 15-8**. The number of movements is conservative as operational traffic is not expected to be travelling to and from the FSRU and/or the Crib Point Receiving Facility daily, but instead on intermittently, primarily to restock nitrogen and odorant and by the operational workforce.

### 15.8.2 Road link assessment (Risk ID TP12)

Roads within the study area are expected to be impacted by workforce and truck movements. However, the road impacts are expected to be insignificant to minor under the conservative operational traffic assessment scenario with all key study area roads expected to perform at an acceptable LOS.

Roads anticipated to be impacted due to transport of nitrogen B-double trucks would be subject to mitigation to manage and mitigate safety, amenity and traffic operation risks within Hastings (see mitigation measure MM-TP01). A pavement strength survey would also determine if the selected roads are fit to accommodate the projected heavy vehicles from operational traffic (see mitigation measure MM-TP05).

### 15.8.3 Intersection capacity (Risk ID TP12)

The capacity and/or safety of an intersection can be potentially influenced where generated project traffic creates significant additional traffic volumes for extended periods of times. Several key intersections have been identified that operational traffic may impact. These identified intersections are located within the alignment of Frankston–Flinders Road and accommodate significant existing traffic volumes. The traffic analysis shows capacity impacts are minor with all key intersections performing at an acceptable LOS. This is due to the relatively low traffic volumes generated during the Project’s operation. There would be minor increases in the volume to capacity ratio at the modelled intersections, but these changes are not expected to be noticeable.

**Table 15-8:** Total daily operational traffic generation (return movements)

Impacted roads	Total anticipated operational two-way movements
Woolleys Road	90
The Esplanade	90
Stony Point Road	90
Coolart Road	14
Frankston–Flinders Road	88
Hodgins Road	14
Graydens Road	14
Denham Road	2
Western Port Highway	2
Mt Ararat Road South	2
Mt Ararat Road North	2
Oakview Lane	2
Princes Freeway	2



### 15.8.4 Road network assessment (Risk ID TP11)

The most direct truck route identified for B-double truck movements is via the Mornington Peninsula Freeway and Frankston–Flinders Road. However, alternative routes were investigated with consideration of the following:

- road hierarchy and identification of routes suitable for heavy vehicles
- routes where physical constraints and sensitive land uses were identified
- environmental and traffic factors to minimise social, economic, amenity and land use impacts particularly in denser urban areas such as Hastings and Somerville.

Two alternative routes were identified as shown in **Figure 15-3**: via Coolart Road; and via Western Port Highway/Dandenong–Hastings Road and Coolart Road. Both routes minimise potential social, economic and amenity impacts by avoiding Hastings and Somerville. Both routes are also approved for B-doubles and would provide additional benefits relative to the Frankston–Flinders Road route:

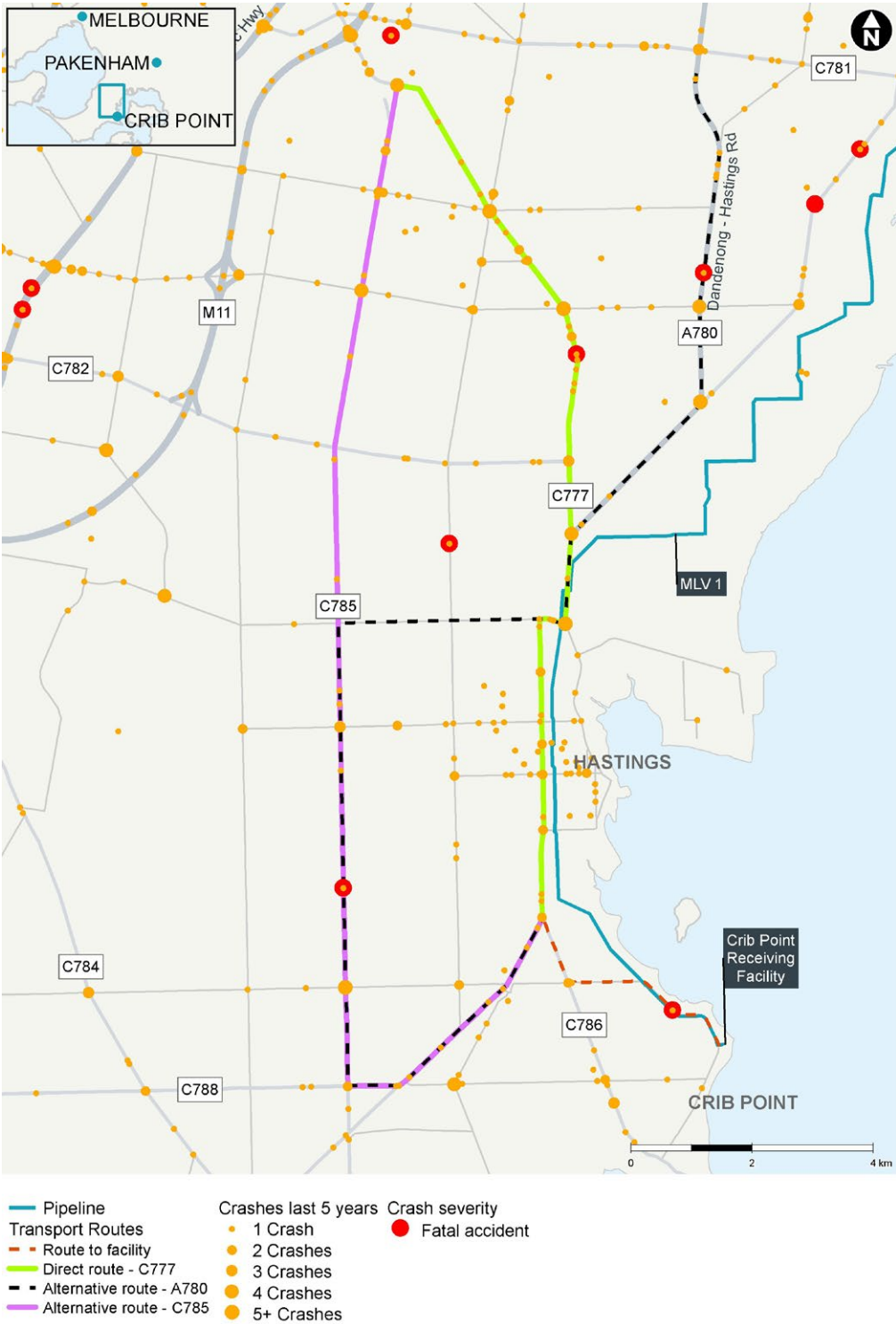
- reducing social impacts by avoiding Hastings and Somerville
- reducing traffic delays by avoiding industrial and activity centres (Hastings and Somerville)
- minimising impact on public and school bus routes
- reducing cyclist and pedestrian crash risk by avoiding areas of activity
- reducing vehicular crash risk by avoiding multiple black spots.

However, it should be noted that while the second alternative via Western Port Highway and Coolart Road provides comparable benefits, there are a number of roundabouts along its length that could result in increased delays and risks. Comparatively, the first alternative via only Coolart Road accommodates less traffic and is therefore safer while decreasing potential (2013-2017)

Once routes have been identified and confirmed as part of the TMP (see mitigation measure MM TP01), a road safety audit would review intersection design and safety requirements on the existing road network and access tracks (see mitigation measure MM-TP04).

Impacts on bus services during the Project's operation are expected to be negligible from a road capacity perspective. As up to 12 truck movements a day (intermittently during the year) would occur for a 20-year duration, interactions between school/public buses and B-double vehicles may increase the risk of crashes on roads within Hastings. This risk increase is also the case for interactions between B-double vehicles and pedestrians/cyclists. Nitrogen transportation is therefore recommended via Coolart Road away from the Hastings town centre to mitigate potential safety impacts (see mitigation measures MM-TP07 and MM-TP01).

Additionally, the frequency of operational traffic movements and recurring heavy loads over 20 years may augment the deterioration of pavement surface on roads anticipated to be used. This is particularly the case for the Esplanade and Woolleys Road as these roads carry lower volumes of traffic and are designed to lower design standards than arterial and B-double-approved roads. Potential impacts of operational traffic on the road network would be further assessed as part of a recommended pavement strength survey (see mitigation measure MM-TP05).



delays.  
**Figure 15-3:**  
Alternative routes  
and crashes in  
the last five years

## 15.9 Residual impacts and legacy impacts

The construction and operation of the Project would unlikely result in significant long-term impacts on the road network surrounding the study area, although consideration of potential residual and legacy impacts is required.

During construction, a minimal temporary increase in traffic volumes would occur across the wider area as the pipeline construction activities move along the alignment. This additional traffic would primarily comprise light vehicles with a small number of buses and heavy vehicles and is expected to be less than 120 vehicles during peak hours on key roads within the study area.

Road pavements along the roads identified for use within the wider region are likely to be of a sufficient standard to cater for the weight and number of vehicles travelling along these roads. However, asset protection permits would be sought from the Cardinia Shire Council, City of Casey and Mornington Peninsula Shire to document and agree on the condition of existing infrastructure and intervention levels should deterioration occur. The intention is to ensure the road network remains in the same or better condition than recorded before their use by the Project.

Once the Project was operating, traffic volumes along roads within the study area would generally revert to existing conditions, with the exception of Woolleys Road and the Esplanade providing access to the Crib Point Receiving Facility. These additional volumes are not anticipated to exceed road capacity.

### 15.10 Cumulative impacts

There is potential for the construction phase of the Project to coincide with other construction works proposed to be undertaken by the Port of Hastings Development Authority (PoHDA) at the Crib Point Jetty. These works would involve the upgrading of existing berth facilities at the Crib Point Jetty, involving three main activities:

- Remediation work to the existing jetty structures
- Demolition and removal of the existing pier head at Berth 2, and construction of a new replacement
- New berthing and mooring facilities, new platforms and catwalks, new marine equipment and navigation aids.

It is currently estimated that 120 personnel would be required on average per day during the upgrade works. While most construction personnel are expected to use marine transportation to arrive at site, it is anticipated approximately 40 workers would be arriving via roads. This would result in a daily total of 80 light vehicle movements generated during the upgrade works, leading to increased traffic on local roads particularly Woolleys Road and the Esplanade.

These upgrade works may occur concurrently or sequentially with the Project for a potential period of six months. However, scheduled timing for the Crib Point Jetty upgrade works is yet to be confirmed. In the event that the PoHDA jetty upgrade works coincide with the Project, the relatively low traffic volumes expected to be generated by the upgrade works are anticipated to have minor impacts. Because the traffic would be minimal, changes in volume to capacity ratio on roads within the study area are assumed to be minor and not expected to be noticeable given the residual spare capacity on these roads.

Additionally, it should be noted that alternative transport methods such as shuttles are being considered by PoHDA to transport the workforce to and from the construction site which would reduce potential traffic impacts from the upgrade works, should they coincide with the construction phase of the Project.

Consideration of potential cumulative impacts associated with the PoHDA Crib Point Jetty upgrade works would be given in the TMP prepared for the Project. In addition, PoHDA is committed to ensuring that the development of the TMP for the jetty upgrade works aligns with the TMP developed for the Project once the upgrade works are confirmed.

### 15.11 Mitigation measures

The mitigation measures developed for transport impacts are summarised in **Table 15-9**. Mitigation measures have been developed to address transport impacts as part of other Technical Reports prepared for the EES. Specific mitigation measures relating to noise, dust and business impacts during construction of the Project are provided in:

- **Chapter 12** Air quality
- **Chapter 13** Noise and vibration
- **Chapter 19** Business.

Table 15-9: Transport mitigation measures

Mitigation measure ID	Mitigation measure	Works area	Project phase
MM-TP01	<b>Traffic Management Plan (TMP)</b> A Traffic Management Plan (TMP) will be prepared and implemented for construction by an appointed contractor for approval by the relevant local government authorities and VicRoads. The TMP will include specific measures for discrete components or stages of the works having the potential to impact on roads, shared use paths, bicycle paths, footpaths or public transport infrastructure. The TMP will include a number of sub-plans including: <ul style="list-style-type: none"> <li>• Public Transport Disruption Management sub-plan</li> <li>• Pedestrian and cyclist connectivity</li> </ul>	Gas Import Jetty Works and Pipeline Works	Construction
MM-TP02	<b>Level Crossing Audit</b> An audit of the existing level crossing with passive control adjacent to Frankston–Flinders Road will be carried out and advanced notice given to affected residents, businesses or industries. This includes measures such as letter notification to inform residents and businesses of upcoming works and road closures. Stakeholder engagement and communications strategies will be established in the TMP and the Stakeholder Engagement Management Strategy to be prepared for the Project. Stakeholders may include local councils, road authorities, business operators and residents among others. During operation, regular meetings will occur with Mornington Peninsula Shire and an agreement will be reached with the local council to confirm pavement upgrades of impacted local roads around Crib Point, subject to the pavement strength survey results.	Pipeline Works	Design and Construction
MM-TP03	<b>Stakeholder consultation on transport changes</b> Prior to commencement of works and any temporary road closures, stakeholder consultation will be carried out and advanced notice given to affected residents, businesses or industries. This includes measures such as letter notification to inform residents and businesses of upcoming works and road closures. Stakeholder engagement and communications strategies will be established in the TMP and the Stakeholder Engagement Management Strategy to be prepared for the Project. Stakeholders may include local councils, road authorities, business operators and residents among others. During operation, regular meetings will occur with Mornington Peninsula Shire and an agreement will be reached with the local council to confirm pavement upgrades of impacted local roads around Crib Point, subject to the pavement strength survey results.	Gas Import Jetty Works and Pipeline Works	Construction and Operation
MM-TP04	<b>Road Safety Audit</b> Intersections will be designed and constructed to provide safe vehicle movements to the satisfaction of the responsible road management authority. A Road Safety Audit will be undertaken upon finalisation of the proposed routes and access tracks to confirm mitigation measures. This will consider investigating existing warning signage, lighting, turning movement lane provision and sight clearance and access track alignment modifications to improve safe intersection sight distance (SISD) for those that are non-conforming. This includes management measures such as advanced warning signage and flag lighting. In order to provide a safe route for the operation stage, signage improvements and speed reduction measures will be considered at Hunts Road to minimise the likelihood of collision with other vehicles at the black spot identified at the intersection between Hunts Road and the Coolart Road. The Road Safety Audit will be undertaken in consultation with local councils.	Gas Import Jetty Works and Pipeline Works	Construction and Operation
MM-TP05	<b>Pavement strength survey</b> A pavement strength survey will be undertaken for Woolleys Road and the Esplanade prior to construction to determine suitability to accommodate projected heavy vehicles for construction and operation phases. The survey's results will determine potential location where road upgrade may be required. Key gravel roads within the study area will be assessed separately and will be subject to specific maintenance checks. These roads will be named within the Traffic Management Plan once the Project details have been confirmed. Pavement will be restored to existing condition or better after construction.	Gas Import Jetty Works and Pipeline Works	Design, Construction and Operation



Mitigation measure ID	Mitigation measure	Works area	Project phase
MM-TP06	<b>Public Transport Disruption Management sub-plan</b> Prior to commencement of works affecting public transport services, a plan to minimise disruption to public transport services resulting from Project construction activities will be developed and implemented. The plan will be developed in consultation with relevant authorities such as Public Transport Victoria and the Department of Transport and will be included as a sub-plan to the TMP.	Gas Import Jetty Works and Pipeline Works	Construction
MM-TP07	<b>Nitrogen Transport Plan</b> A Nitrogen Transport Plan will be developed. This plan will include identifying the preferred route(s), management measures at key intersections and permit requirements for access to roads that are not approved B-double routes. Alternative roads to bypass Hastings and Somerville town centres will be used where possible.	Gas Import Jetty Works	Operation

## 15.12 Conclusion

Project-related activities during construction would likely temporarily impact traffic operations within the Project Area. Transport impacts are expected to be most pronounced at the peak of the construction period when the construction workforce volume is at its highest. Impacts on traffic volumes, intersection safety, road closures, pedestrians and cycling, as well as public transport would likely be experienced during construction. A TMP and Public Transport Disruption Management sub-plan would be the primary mitigation measures. Other mitigation measures include:

- limiting road/lane closures to off-peak periods or proposing alternative methods to avoid the impact all together
- transporting workforce by bus to key destinations
- audits of key intersections and level crossings identified as unsafe before construction
- optimising any Hastings works for pedestrian and cyclist connectivity
- avoiding and minimising debris on road (spoil removal plan)
- maintaining emergency vehicle access.

The assessment of operational impacts showed that the additional workforce, nitrogen and odorant truck movements would result in minor impacts on the level of service of key local and declared roads within the study area. Identifying the preferred route for nitrogen and odorant trucks would be the key management measure to enable safe and efficient operation of the transport network, by reducing the likelihood of unacceptable impacts on road and intersection safety (particularly pedestrian, cyclists and bus passengers within Hastings) and amenity. Implementation of the mitigation measures would lead to the efficient and safe operation of the transport network during construction and operation, reducing the likelihood of adverse impacts on travel time, reliability and road safety.

In response to the social, economic, amenity and land use, and the energy efficiency, security, affordability and safety draft evaluation objectives, impacts of the Project on transport have been assessed and mitigation measures have been identified to reduce or minimise these impacts.

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