

# **APPENDIX 2**

## **PRELIMINARY TRAFFIC REVIEW**



Our ref: PS118451-TDP-LTR-001 Rev 01

6 May 2020

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Dear David,

## 1. INTRODUCTION

To assist with the preparation of the Mornington Peninsula Shire Industrial Areas Strategy, WSP have undertaken a traffic review of investigation area to determine which location may present the best opportunity for future rezoning for industrial use. Figure 1.1 following shows the wider investigation area that is being considered.

Figure 1.1 Investigation areas



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Within this wider investigation area, it is understood that 3 precincts exist which, with consideration to the wider area, have been identified as possible locations for the future rezoning.

For the purposes of this assessment, it is therefore these 3 identified precincts which have been the primary focus. The 3 precincts (including associated land offerings) that are under investigation are listed below and shown in Figure 1.2 following.

1. Somerville – 120.8hA
2. Tyabb – 113.9hA
3. Hastings – 191.7hA

Figure 1.2 Investigation precincts





Figure 1.3 shows the locations of the precincts within the context of the wider surrounding road network and Peninsula.

Figure 1.3 Precinct Context Plan – Surrounding Road Network



Source: <http://www.street-directory.com.au/>

A traffic engineering review has subsequently been undertaken of each precinct in order to identify which location, from a traffic perspective, is the preferred location for the proposed rezoning. In undertaking this review, consideration has been given to the following elements for each of the identified locations:

- Surrounding road network and heavy vehicle connectivity options;
- Precinct accessibility and restrictions;
- Condition of the surrounding roads;
- Location with respect to nearby residential and town areas;
- Anticipated precinct generated traffic volumes, distributions, and resultant impacts;
- Future development (roads) of the surrounding area and road network upgrades; and
- Public transport accessibility and options.

Subsequently, an opportunities and constraints assessment has been undertaken for each of the 3 identified precincts. Based on this, a preferred precinct from a traffic perspective has been identified.



## 2. PRECINCT CONSIDERATIONS

### 2.1 AREA REQUIREMENTS

In identifying each of the 3 possible precincts, consideration has been given to the current and future industrial area requirements that will need to be accommodated.

Based on a review of provided background material, it is understood that historical growth (2005 – 2015) in total industrial land requirements has generally been around 2.9hA per annum.

Further to this, the Economical Assessment undertaken as part of this study indicates that to meet current and future demands, between 40hA – 60hA industrial land should be allowed for within the chosen precinct to accommodate industrial growth over the next 15 years. This equates to growth rates of industrial land demand of between 2.7hA – 4.0hA per annum.

Conservatively assuming the higher growth rate of 4.0hA per annum, it is therefore considered that over the next 10 years, approximately 40hA of industrial area will need to be accommodated within the chosen precinct which should be possible based on the above noted area provisions for each of the 3 considered locations.

### 2.2 TRAFFIC GENERATION

In estimating traffic volumes for the future industrial precinct, the following assumptions have been applied:

- A built form rate of 45% the total precinct area. This allows for the provision of road reserves, parking areas, and other ancillary uses to the industrial precinct within the remain land area.
- Typical daily traffic generation rate of 4.6 movements per 100sqm of floor area (RTA Guide to Traffic Generating Developments – TDT 2013/04a – August 2013). It is noted that this rate is an average across varying sizes of industrial uses and, with respect to case study data for a variety of industrial uses held by WSP, is considered conservatively high with respect to larger scale developments.
- Typical peak hour traffic generation for the AM peak of 0.52 vehicle movements per 100sqm of floor area, and the PM peak of 0.56 vehicle movements per 100sqm of floor area (RTA Guide to Traffic Generating Developments – TDT 2013/04a – August 2013)

Based on these assumptions, the industrial precinct could be anticipated to generate in the order of 8,300 vehicle movements per day with between 940 – 1,010 vehicle movements in each of the AM and PM peak hours.

These anticipated volumes are inclusive of both light (passenger vehicles, vans) and heavy (large rigid trucks and semi-trailers) vehicle movements as would typically be generated by an industrial precinct.

Of these movements, available DoT data for the surrounding road network in conjunction with investigations of other industrial areas, indicates that between 15% – 20% could be attributable to heavy vehicles. This equates to up to 1,660 daily heavy vehicle movements, with approximately 190 – 200 occurring during each of the AM and PM peak periods.



## 2.3 TRAFFIC DISTRIBUTIONS

With regards to the distributions of traffic to and from the precinct, it is anticipated that this will vary between light and heavy vehicle movements and are subsequently presented separately for both options.

Based on the location of the precinct with respect to the surrounding area and Western Port Bay, distribution of vehicle movements will typically be possible in the following directions:

- North – towards the Melbourne CBD and the wider surrounding transport network.
- South – towards Hastings (including port facilities) and the southern extent of Mornington Peninsula.
- West – towards Port Phillip Bay and the Mornington Peninsula Freeway.

It is noted that these distributions are high level only and are based on a review of surrounding conditions and like key points of travel. Should more detailed analysis be required then data collection and strategic modelling will need to be undertaken.

### 2.3.1 LIGHT VEHICLES

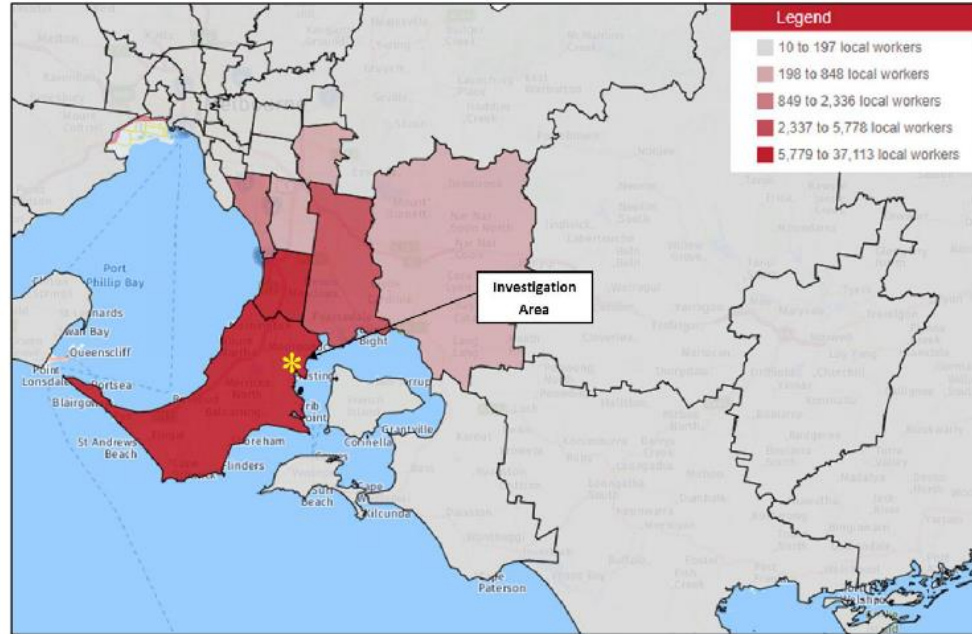
Light vehicle movements (passenger vehicles, vans, etc) will typically be generated by workers travelling to and from the precinct, as well as smaller delivery vehicles that will typically be servicing the surrounding area. Given the intent of the precinct is to facilitate local needs and growth, it is anticipated that these movements will primarily be drawn from the nearby surrounding residential and commercial areas.

Subsequently, to identify where employees within the peninsula will be travelling from for work, place of residence data for employees working within the Mornington Peninsula Shire has been reviewed. This data indicates that 75% of workers reside within the shire, with a further 12% coming from the adjacent Frankston Council municipality. The remaining 13% of workers are distributed across other nearby council areas.

Figure 2.1 provides a summary of place of residence density for employees within the Mornington Peninsula Shire.



Figure 2.1 2016 ABS Data – Mornington Peninsula Shire – Workers Place of Residence



Source: <https://profile.id.com.au/mornington-peninsula/workers>

With regards to the residential populations of surrounding areas, and 2016 journey to work data, distributions of these movements would therefore be anticipated to be as follows:

- North - 25%
- South - 30%
- West - 45%

### 2.3.2 HEAVY VEHICLES

In terms of heavy vehicles (large rigid trucks and semi-trailers), it is anticipated that these will primary be distributed to/from the primary transport nodes within the area. This includes the Hastings Port as well as the key transport corridors of the Mornington Peninsula Freeway and Western Port Highway, and by extension Eastlink, the Monash Freeway, and Princes Freeway.

Based on the location of these transport corridors with respect to the identified precincts, distributions of these movements could therefore be anticipated to be as follows:

- North - 55%
- South - 15%
- West - 30%



## 2.4 ROAD CONNECTIONS

Within proximity of the chosen precincts, a network of roads already exist that are gazetted for B-double use. These roads would allow a direct means of connection to the wider transport network for the larger industrial vehicles that are likely to be generated through rezoning of one of the chosen precincts.

Figure 2.2 shows the location and proximity of each precinct to the surrounding gazetted road network with Figure 2.3 showing the connections to the wider surrounding gazetted network.

Figure 2.2 Precinct Context - Gazetted B-Double Road Network

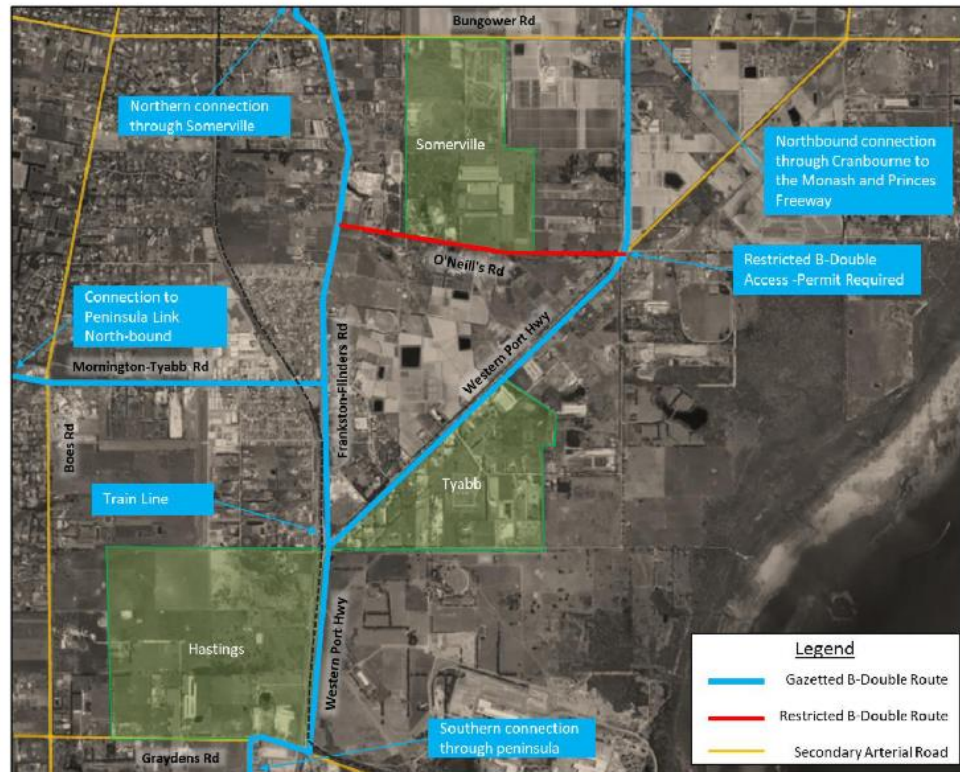
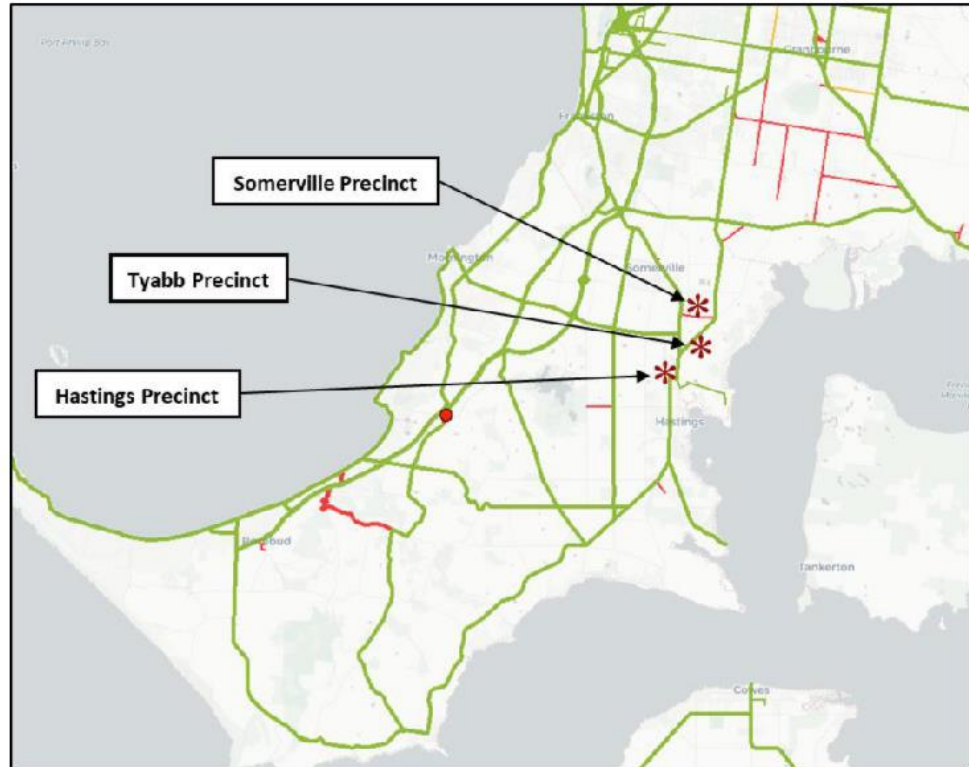




Figure 2.3 Victoria's Gazetted B-Double Network



Source: <https://www.vicroads.vic.gov.au/business-and-industry/heavy-vehicle-industry/heavy-vehicle-map-networks-in-victoria>

## 2.5 ROAD NETWORK CAPACITY

In line with guidance from the Austroads Guide to Traffic Management (Part 3), arterial roads comprising a single width carriageway with a single lane of travel in each direction can generally accommodate up to 15,000 – 18,000 two-way daily vehicle movements. Once this threshold is reached consideration is generally given to duplication of the road.

For the purposes of the investigation being undertaken, it has therefore been considered that given all of the arterial roads that will likely be utilised within the investigation area generally comprise a single width carriageway with a single lane of travel in each direction, that they will all have a theoretical capacity for up to 15,000 – 18,000 two-way daily vehicle movements.

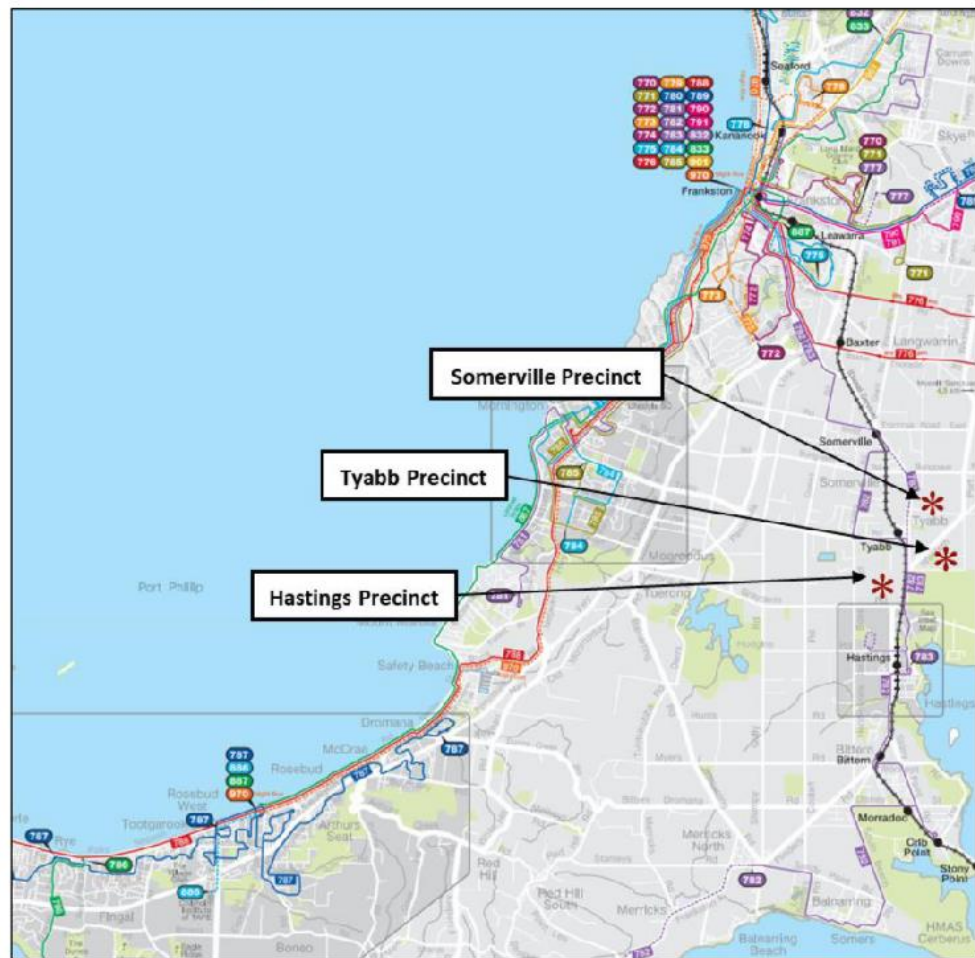


## 2.6 PUBLIC TRANSPORT

Public transport along the Mornington Peninsula consists primarily of buses along the Port Phillip Bay side of the Peninsula, with both buses and a train line operating for connection to the Western Port Bay side. Connection between the public transport options for both sides of the Peninsula currently only occurs in Frankston, with no direct public transport crossover currently provided between Port Phillip Bay and Western Port Bay.

Figure 2.4 below shows the public transport network available along the Peninsula and the proximity of each of the investigation precincts to this network.

Figure 2.4 Public Transport Network



Source: [https://www.ptv.vic.gov.au/assets/default-site/more/maps/Local-area-maps/Metropolitan/ef1e6e9e77/38\\_Mornington\\_Peninsula\\_LAM.pdf](https://www.ptv.vic.gov.au/assets/default-site/more/maps/Local-area-maps/Metropolitan/ef1e6e9e77/38_Mornington_Peninsula_LAM.pdf)



### 3. SOMERVILLE PRECINCT

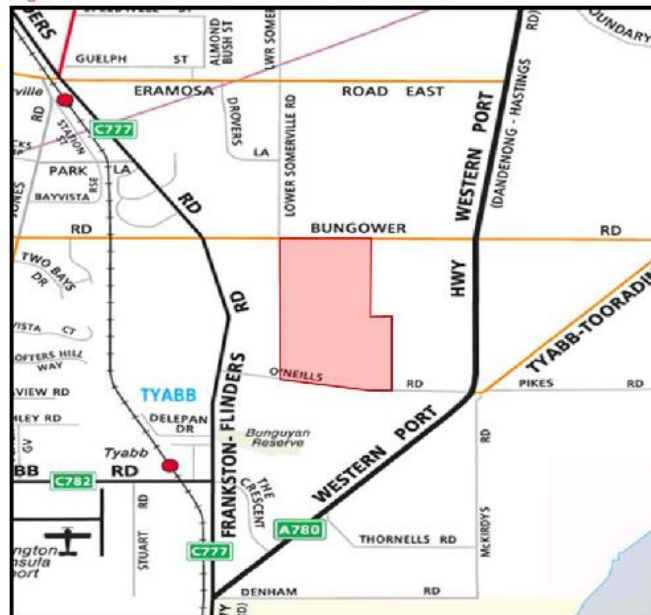
#### 3.1 PRECINCT CONSIDERATIONS

##### 3.1.1 LOCATION

The Somerville precinct is located less than 1km south-east of the outer fringes of the Somerville township, and is situated approximately midway between Frankston-Flinders Road and the Western Port Highway. The identified land parcel extends from Bungower Road along its northern frontage down to O'Neill's Road along its southern boundary and accommodates a total area of 120.8ha.

Figure 3.1 shows the location of the precinct within the context of the surrounding road network.

Figure 3.1 Somerville - Precinct Context Plan



Source: <http://www.street-directory.com.au/>

##### 3.1.2 PRECINCT ACCESS

Based on the layout of the investigation precinct, it is considered that access could be facilitated primarily via Bungower Road along its northern frontage, as the current arrangement and use O'Neill's Road to the south is probably not sufficient for the proposed industrial use.

Based on future traffic volumes, consideration may need to be given to upgrading the existing road conditions in order to provide dedicated turn treatments, or if warranted, controlled intersections into the precinct. Further detailed investigation is required to determine the treatment or intersection requirements.

##### 3.1.3 PUBLIC TRANSPORT PROXIMITY

As identified in Figure 2.4, bus route #783 currently operates within approximately 1km of the precinct. This route provides connection to both Somerville and Tyabb train stations which are also both located within 2.5km proximity of the precinct.

Based on future demand and development, opportunity could therefore exist for this bus route to be re-routed, providing more direct access to the industrial precinct.

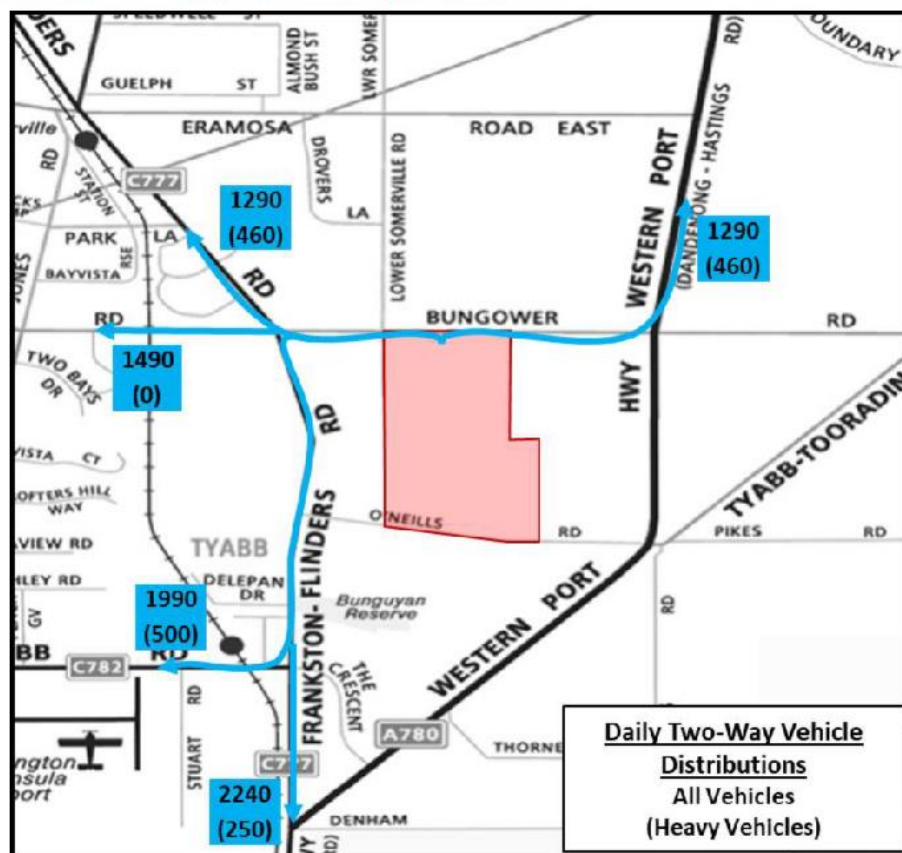


### 3.2 TRAFFIC AND DISTRIBUTIONS

#### 3.2.1 ANTICIPATED DISTRIBUTIONS

Based on the traffic volume and distribution analysis undertaken in Section 2.2 and 2.3, Figure 3.2 has been prepared to show the anticipated traffic distributions (total vehicles and heavy vehicles) from the Somerville precinct. In preparing these distributions, it has been assumed that whilst generally taking the most direct path, where possible, any heavy vehicle movements will also typically travel along gazetted B-double approved roads.

Figure 3.2 Somerville Precinct - Traffic Distribution



#### 3.2.2 IMPACTS

Based on the preceding distributions, the following possible impacts on surrounding towns have been noted:

- Somerville – 1,290 additional daily vehicle movements, including 460 heavy vehicles.
- Tyabb – 4,230 additional daily vehicle movements, including 750 heavy vehicles.
- Hastings – 2,240 additional daily vehicle movements, including 250 heavy vehicles.

Based on these additional traffic movements, further investigation is likely required to assess the impact that this would have on the operation of existing intersections and roads within proximity of the investigation area. It is also noted that these increased volumes may have impacts on existing amenity and liveability in these towns.



### 3.3 ROAD NETWORK

The road network within direct proximity of the precinct consists of:

#### BUNGOWER ROAD

Bungower Road runs in an east-west alignment along the northern frontage of the investigation area and is classified as a secondary arterial (Road Zone 2). It comprises a single width carriageway accommodating a single lane of travel in each direction.

Whilst not part of the gazetted B-double network, precinct observations indicate that it is currently accommodating movements by large rigid and articulated trucks and appears to be in adequate condition to continue this operation.

The following figure shows the existing conditions along Bungower Road.

*Figure 3.3 Bungower Road – Typical Existing Configuration*



Source: [www.nearmap.com.au](http://www.nearmap.com.au)

Further detailed investigation may however need to be conducted to ensure that the existing pavement depth and composition is adequate to support additional traffic and heavy vehicle movements.

Provided traffic volume data for Bungower Road indicates that at present, it accommodates almost 8,000 daily vehicle movements along the frontage of the precinct.

As per the anticipated distributions presented in Figure 3.2, it is anticipated that along the section of road to the west of the precinct, delivery of an industrial precinct could generate a further 7,000 daily vehicle movements along Bungower Road, increasing the total two-way daily traffic to approximately 15,000 vehicle movements.

Based on the assumption that Bungower Road could operate with a two-way mid-block capacity of 15,000 daily vehicle movements it is therefore considered that the total daily movements could potentially cause a noticeable impact on the operations of intersections along Bungower Road and would likely warrant duplication to accommodate these movements.

Consideration will also need to be given to detailed analysis of existing intersections in order to further assess any potential impacts and upgrade requirements.



### O'NEILLS ROAD

O'Neills Road runs in an east-west alignment along the southern frontage of the investigation area and operates primarily as a rural access road. It comprises a single width, un-line-marked carriageway allowing for two-way traffic flow.

O'Neills Road is classified as being part of the gazetted B-double network, however access is restricted, requiring approval from the road authority.

Inspection of the existing road indicates that consideration may need to be given to upgrading the existing road if it were to operate in a capacity whereby it frequently accommodated large vehicle movements to and from an industrial area.

The following figure shows the existing conditions along O'Neills Road.

Figure 3.4 O'Neills Road – Typical Existing Configuration



Source: [www.nearmap.com.au](http://www.nearmap.com.au)

Whilst at present it is not proposed that O'Neills Road would be utilised to provide access to the precinct given its lower order status and existing conditions, it is envisaged that should use of it be considered then further detailed investigation will need to be conducted to ensure that the existing pavement depth and composition is adequate to support additional traffic and heavy vehicle movements. This will dictate the extent of any upgrade works that may be required to accommodate future industrial traffic volumes.



### WESTERN PORT HIGHWAY

Within proximity of the precinct, Western Port Highway is aligned in a north-south direction and is classified as a Road Zone 1. It currently comprises a single width carriageway, inclusive of sealed shoulders, and accommodates a single travel lane in each direction.

Western Port Highway is part of the VicRoads gazetted B-double route network, and based on visual review of the road, appears in adequate condition to continue operating in this arrangement.

The following figure shows the existing conditions along Western Port Highway proximate to the investigation area.

Figure 3.5 Western Port Highway – Typical Existing Configuration



Source: [www.nearmap.com.au](http://www.nearmap.com.au)

Further detailed investigation may however need to be conducted to ensure that the existing pavement depth and composition is adequate to support additional traffic and heavy vehicle movements.

VicRoads traffic volume data indicates that Western Port Highway is currently estimated to accommodate in the order of 7,500 two-way daily vehicle movements within proximity of the precinct.

As per the anticipated distributions presented in Figure 3.2, it is anticipated that the industrial precinct would generate approximately 1,300 additional daily vehicle movements along Western Port Highway, increasing the total two-way daily traffic to approximately 8,800 vehicle movements.

Based on the assumption that Western Port Highway has a two-way mid-block operational capacity of 15,000 daily vehicle movements, it is therefore considered that the total daily movements would continue to be adequately accommodated within the current road configuration.

It is therefore considered that based on the available information there would be no need to upgrade the existing configuration of Western Port Highway to provide increased capacity, however further detailed studies may still be warranted.



**FRANKSTON-FLINDERS ROAD**

Within proximity of the precinct, Frankston-Flinders Road is aligned in a north-south direction and is classified as a Road Zone 1. It currently comprises a single width carriageway, inclusive of sealed shoulders, and accommodates a single travel lane in each direction.

Frankston-Flinders Road is part of the VicRoads gazetted B-double route network, and based on visual review of the road, appears in adequate condition to continue operating in this arrangement.

The following figure shows the existing conditions along Frankston-Flinders Road proximate to the investigation area.

*Figure 3.6 Frankston-Flinders Road – Typical Existing Configuration*



Source: [www.nearmap.com.au](http://www.nearmap.com.au)

Further detailed investigation may however need to be conducted to ensure that the existing pavement depth and composition is adequate to support additional traffic and heavy vehicle movements.

VicRoads traffic volume data indicates that between O’Neills Road and Mornington-Tyabb Road, Frankston-Flinders Road is currently estimated to accommodate in the order of 10,000 two-way daily vehicle movements.

As per the anticipated distributions presented in Figure 3.2, it is anticipated that the industrial precinct would generate approximately 4,200 additional daily vehicle movements along this section of Frankston-Flinders Road, increasing the total two-way daily traffic to approximately 14,200 vehicle movements.

Based on the assumption that Frankston-Flinders Road has a two-way mid-block operational capacity of 15,000 daily vehicle movements, it is therefore considered that the total daily movements could continue to be accommodated within the current road configuration however should increases traffic from other uses also occur then capacity constraints may start to be experienced. Further detailed investigation may also be warranted in order to assess future intersection operations along Frankston-Flinders Road.

It is therefore considered that there would be no need to upgrade the existing configuration of Frankston-Flinders Road to provide increased capacity.



### 3.4 OTHER CONSIDERATIONS

#### POSSIBLE INTERSECTION UPGRADES

- Should O’Neills Road be utilised for precinct access then consideration will need to be given to upgrades at the intersection of Frankston-Flinders Road and O’Neills Road.

At present, the intersection of Frankston-Flinders Road and O’Neills Road currently only operates as a simple T-intersection with minimal control or road widening provided for turning vehicles.

Should the precinct be positioned in the investigated area, it is therefore considered that this intersection may need to be upgraded in the form of either additional widening to provide turn lanes, or the provision of a controlled intersection (roundabout or signals). This would be subject to further detailed analysis of traffic volumes and impacts.

#### FUTURE TRAFFIC RE-DISTRIBUTION

- At present, all heavy vehicle movements within Somerville have to pass through the centre of the township thereby meaning that any increase in movements would be noticeable. Should provision be made for a bypass of Somerville to divert existing heavy vehicle movements, then this may also facilitate future movements for the industrial precinct and reduce the impact on local traffic.

### 3.5 OPPORTUNITIES AND CONSTRAINTS ASSESSMENT

With respect to the preceding considerations, Table 3.1 has been prepared providing an opportunities and constraints assessment for the Somerville precinct.

Table 3.1 Opportunities and Constraints Assessment - Somerville

OPPORTUNITIES	CONSTRAINTS
<b><u>Road Network Connectivity</u></b>	
— The precinct is surrounded by several B-double gazetted roads which will allow for distribution of traffic to the wider road network and peninsula.	— The majority of primary access routes from the precinct pass through surrounding townships (Somerville and Tyabb) which may therefore impact existing traffic conditions and amenity in these areas.
<b><u>Precinct Access</u></b>	
— Opportunity may exist (subject to future road upgrades) for precinct access to be facilitated from 2 frontages, allowing improved distribution of precinct traffic.	— At present, precinct access can only be facilitated along a single frontage, restricting possible future development opportunities and precinct connections.
<b><u>Road Condition</u></b>	
—	— Whilst noted as being part of the gazetted B-double network, the existing conditions and configuration of O’Neills Road is probably not adequate to accommodate the frequent vehicle and large vehicle movements that would be generated by an industrial estate. Consideration would likely need to be given to upgrading this road if access were to be facilitated in this location.



OPPORTUNITIES	CONSTRAINTS
<b><u>Precinct Location and Town Proximity</u></b>	
<ul style="list-style-type: none"> <li>— The subject precinct is located less than 3km from the centre of the township of Somerville, providing quick and convenient access to the precinct for residents from the local area.</li> </ul>	<ul style="list-style-type: none"> <li>— Increased traffic movements (including heavy vehicles) as generated by the precinct, may impact the functionality of the road network within the nearby Somerville township due to the precinct's proximity.</li> </ul>
<b><u>Traffic Generation and Distribution</u></b>	
<ul style="list-style-type: none"> <li>—</li> </ul>	<ul style="list-style-type: none"> <li>— There is anticipated to be a big increase in the volume of daily traffic moving through towns in the area as follows:                             <ul style="list-style-type: none"> <li>— Somerville – 1,290 vpd</li> <li>— Tyabb – 4,230 vpd</li> <li>— Hastings – 2,240 vpd</li> </ul>                             Traffic volumes through Tyabb will be the worst out of all options presented.                         </li> </ul>
<ul style="list-style-type: none"> <li>—</li> </ul>	<ul style="list-style-type: none"> <li>— Based on current recorded traffic volumes on Bungower Road, the additional traffic as generated by the precinct may result in a noticeable change to the current traffic conditions and may also result in the need for road upgrade considerations to increase road network capacity.</li> </ul>
<b><u>Future Development and Road Network Upgrades</u></b>	
<ul style="list-style-type: none"> <li>— Provision of a heavy vehicle bypass for Somerville would allow for development of the precinct, without the increased heavy vehicle movements impacting local traffic in the town centre.</li> </ul>	<ul style="list-style-type: none"> <li>— The intersection of O'Neills Road and Frankston-Flinders Road will likely need to be upgraded to accommodate future traffic movements from the precinct if O'Neills Road is to be used as a precinct access.</li> </ul>
<b><u>Public Transport Connectivity</u></b>	
<ul style="list-style-type: none"> <li>— Whilst currently there is no direct public transport access, the proximity of the precinct to an existing bus route could allow for this route to be diverted through the precinct, providing greater connectivity.</li> </ul>	<ul style="list-style-type: none"> <li>—</li> </ul>



## 4. TYABB PRECINCT

### 4.1 PRECINCT CONSIDERATIONS

#### 4.1.1 LOCATION

The Tyabb precinct is located directly south-east of the outer fringes of the Tyabb township. The identified land parcel is bound by Western Port Highway along its north-western frontage and Denham Road along its southern boundary. It accommodates a total area of 113.9hA.

Figure 4.1 shows the location of the precinct within the context of the surrounding road network.

Figure 4.1 Tyabb - Precinct Context Plan



Source: <http://www.street-directory.com.au/>

#### 4.1.2 PRECINCT ACCESS

Based on the layout of the investigation precinct, it is considered that primary access could be facilitated either via Western Port Highway along its north-western frontage with potential for a secondary access via Denham Road along its southern boundary.

Based on future traffic volumes, consideration may need to be given to upgrading the existing road conditions in order to provide dedicated turn treatments, or if warranted, controlled intersection into the precinct. Further detailed investigation is required to determine the treatment or intersection requirements.

#### 4.1.3 PUBLIC TRANSPORT PROXIMITY

As identified in Figure 2.4, bus route #782 and #783 currently operate within less than 1km of the precinct. This route provides connection to the Tyabb train stations which is located approximately 1.2km from the precinct.

Based on future demand and development, opportunity could therefore exist for this bus route to be re-routed, providing more direct access to the industrial precinct.

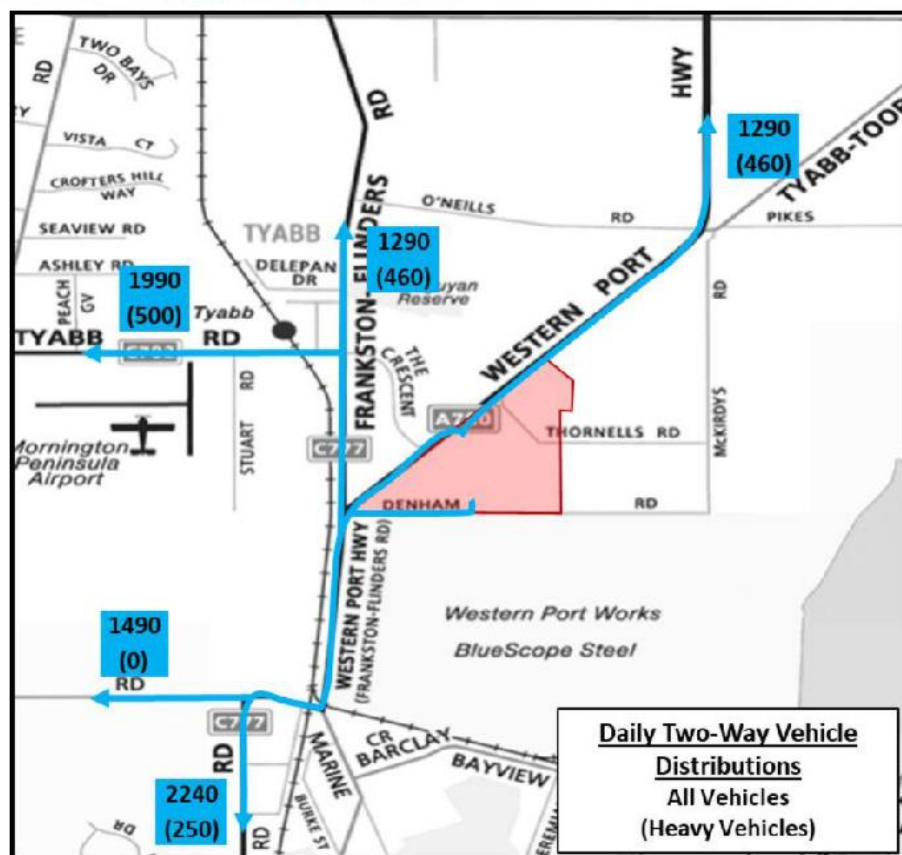


## 4.2 TRAFFIC AND DISTRIBUTIONS

### 4.2.1 ANTICIPATED DISTRIBUTIONS

Based on the traffic volume and distribution analysis undertaken in Section 2.2 and 2.3, Figure 4.2 has been prepared to show the anticipated traffic distributions (total vehicles and heavy vehicles) from the Tyabb precinct. In preparing these distributions, it has been assumed that whilst generally taking the most direct path, where possible, any heavy vehicle movements will also typically travel along gazetted B-double approved roads.

Figure 4.2 Tyabb Precinct - Traffic Distribution



### 4.2.2 IMPACTS

Based on the preceding distributions, the following possible impacts on surrounding towns have been noted:

- Somerville – 1,290 additional daily vehicle movements, including 460 heavy vehicles.
- Tyabb – 3,280 additional daily vehicle movements, including 960 heavy vehicles.
- Hastings – 2,240 additional daily vehicle movements, including 250 heavy vehicles.

Based on these additional traffic movements, further investigation is likely required to assess the impact that this would have on the operation of existing intersections and roads within proximity of the investigation area. It is also noted that these increased volumes may have impacts on existing amenity and liveability in these towns.



### 4.3 ROAD NETWORK

The road network within direct proximity of the precinct consists of:

#### WESTERN PORT HIGHWAY

Along the frontage of the precinct, Western Port Highway is aligned in a northeast-southwest direction and is classified as a Road Zone 1. It currently comprises a single width carriageway, inclusive of sealed shoulders, and accommodates a single travel lane in each direction.

Western Port Highway is part of the VicRoads gazetted B-double route network, and based on visual review of the road, appears in adequate condition to continue operating in this arrangement.

The following figure shows the existing conditions along Western Port Highway proximate to the investigation area.

Figure 4.3 Western Port Highway – Typical Existing Configuration



Source: [www.nearmap.com.au](http://www.nearmap.com.au)

Further detailed investigation may however need to be conducted to ensure that the existing pavement depth and composition is adequate to support additional traffic and heavy vehicle movements.

VicRoads traffic volume data indicates that along the possible frontage of the precinct Western Port Highway is currently estimated to accommodate in the order of 27,000 two-way daily vehicle movements.

As per the distributions presented in Figure 4.2, it is anticipated that the industrial precinct could generate up to 7,000 additional daily vehicle movements along Western Port Highway to the south-west of the precinct, increasing the total two-way daily traffic to approximately 34,000 vehicle movements.

Whilst it is noted that VicRoads estimations show that Westernport Highway is currently operating with traffic volumes well in excess of what is typically considered to be operational capacity (15,000), it still considered that the increase in traffic as generated by the precinct, would likely trigger the requirement for further investigations into road operations and upgrade requirements.

These investigations would likely comprise further detailed studies, including the collection of existing traffic volume data in order to ascertain any impacts the future precincts traffic may have on existing road network operations.



**DENHAM ROAD**

Denham Road runs in an east-west alignment along the southern frontage of the investigation area and operates primarily as a rural access road. It comprises a single width, line-marked carriageway allowing for two-way traffic flow. Denham Road appears to primarily operate as a local access road, facilitating movements to surrounding land holdings.

Inspection of the existing road indicates that consideration may need to be given to upgrading the existing road if it were to operate in a capacity whereby it frequently accommodated large vehicle movements to and from an industrial area.

The following figure shows the existing conditions along Denham Road.

*Figure 4.4 Denham Road – Typical Existing Configuration*



Source: [www.nearmap.com.au](http://www.nearmap.com.au)

Further detailed investigation may however need to be conducted to ensure that the existing pavement depth and composition is adequate to support additional traffic and heavy vehicle movements.

VicRoads traffic volume data for Denham Road is not available, however based on its current configuration and a review of the surrounding area, it is expected that current volumes are likely reflective of its capacity and would likely be in the order of 1,000 vehicles per day.

It is therefore considered that dependant on precinct access arrangements (it is noted that it would be desirable for the majority of access to be via Western Port Highway), the industrial precinct could add anywhere up to 3,500 daily vehicle movements to the road and therefore, consideration would need to be given to upgrading Denham Road to allow for it to more formally operate in a capacity capable of accommodating heavy vehicles and other movements.

**4.4 OTHER CONSIDERATIONS**

With regards to the Tyabb Precinct, it is worth noting that aside from traffic considerations, it is understood that the investigation parcel of land sits outside the bounds of the areas identified for industrial use within the Port of Hastings Development Strategy and subsequently may encounter other external difficulties in being identified as a preferred precinct.



#### 4.5 OPPORTUNITIES AND CONSTRAINTS ASSESSMENT

With respect to the preceding considerations, Table 4.1 has been prepared providing an opportunities and constraints assessment for the Tyabb precinct.

Table 4.1 Opportunities and Constraints Assessment - Tyabb

OPPORTUNITIES	CONSTRAINTS
<b><u>Road Network Connectivity</u></b>	
— The precinct is surrounded by several B-double gazetted roads which will allow for distribution of traffic to the wider road network and peninsula.	— The majority of primary access routes from the precinct pass through surrounding townships (Somerville and Tyabb) which may therefore impact existing traffic conditions in these areas.
<b><u>Precinct Access</u></b>	
— Precinct access can be facilitated from 2 frontages, reducing the overall traffic impact at each access point and providing improved distribution of traffic into the surrounding road network.	—
<b><u>Road Condition</u></b>	
— The existing road/pavement conditions of Westport Highway are likely sufficient to accommodate future traffic growth.	— Further review of Denham Road may identify the need for road upgrade works to be undertaken to accommodate future traffic volumes.
<b><u>Precinct Location and Town Proximity</u></b>	
— The subject precinct is located less than 1km from the township of Tyabb, providing quick and convenient access to the precinct for residents from the local area.	— Increased traffic movements (including heavy vehicles) generated by the precinct, may impact the functionality of the road network within the nearby Tyabb township due to the precinct's proximity.
<b><u>Traffic Generation and Distribution</u></b>	
— The location of the precinct will allow for more even distribution of traffic in all directions from the precinct.	— There is anticipated to be a reasonable increase in the volume of daily traffic moving through towns in the area as follows: <ul style="list-style-type: none"> <li>— Somerville – 1,290 vpd</li> <li>— Tyabb – 3,280 vpd</li> <li>— Hastings – 2,240 vpd</li> </ul> Whilst not the worst, traffic volumes through Tyabb are still considered significant compared to other options.
<b><u>Future Development and Road Network Upgrades</u></b>	
— Intersections within proximity of the precinct are already largely developed to accommodate higher volumes of vehicle movements.	— Further investigation is likely required along Westport Highway to determine the impacts of precinct generated traffic and how this will be accommodated within the road network.
<b><u>Public Transport Connectivity</u></b>	
— Whilst currently there is no direct public transport access, the proximity of the precinct to an existing bus route could allow for this route to be diverted through the precinct, providing greater connectivity.	—



## 5. HASTINGS PRECINCT

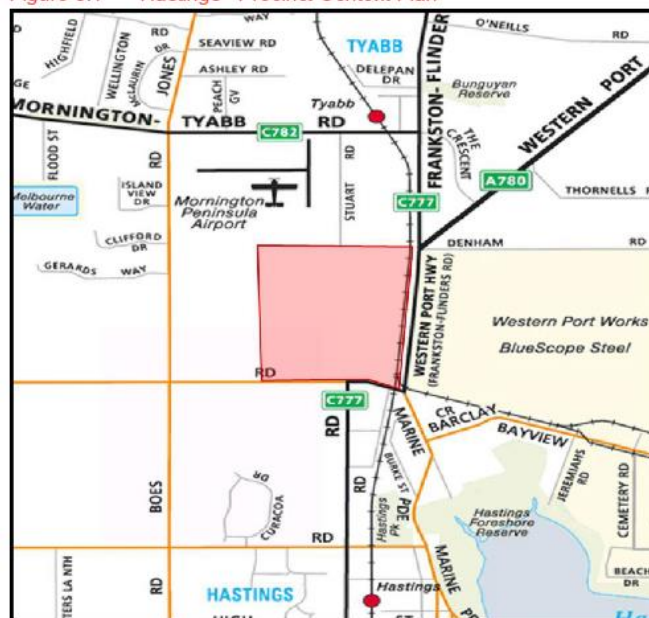
### 5.1 PRECINCT CONSIDERATIONS

#### 5.1.1 LOCATION

The Hastings precinct is located directly south of the Mornington Peninsula Airport and is less than 3km north-west of the Hastings township. The identified land parcel is bound by the Western Port Highway along its eastern frontage and Graydens Road to the south. It accommodates a total area of 191.7hA.

Figure 5.1 shows the location of the precinct within the context of the surrounding road network.

Figure 5.1 Hastings - Precinct Context Plan



Source: <http://www.street-directory.com.au/>

#### 5.1.2 PRECINCT ACCESS

Based on the layout of the investigation precinct, it is considered that due to the railway line along the eastern frontage access could only be facilitated via Graydens Road along the precinct's southern boundary.

Based on future traffic volumes, consideration may need to be given to upgrading the existing road conditions in order to provide dedicated turn treatments, or if warranted, a controlled intersection into the precinct. Further detailed investigation is required to determine the treatment or intersection requirements.

#### 5.1.3 PUBLIC TRANSPORT PROXIMITY

As identified in Figure 2.4, bus route #782 and #783 currently operate within less than 1km of the precinct. This route provides connection to the Tyabb train stations which is located approximately 1.2km from the precinct.

Based on future demand and development, opportunity could therefore exist for this bus route to be re-routed, providing more direct access to the industrial precinct.

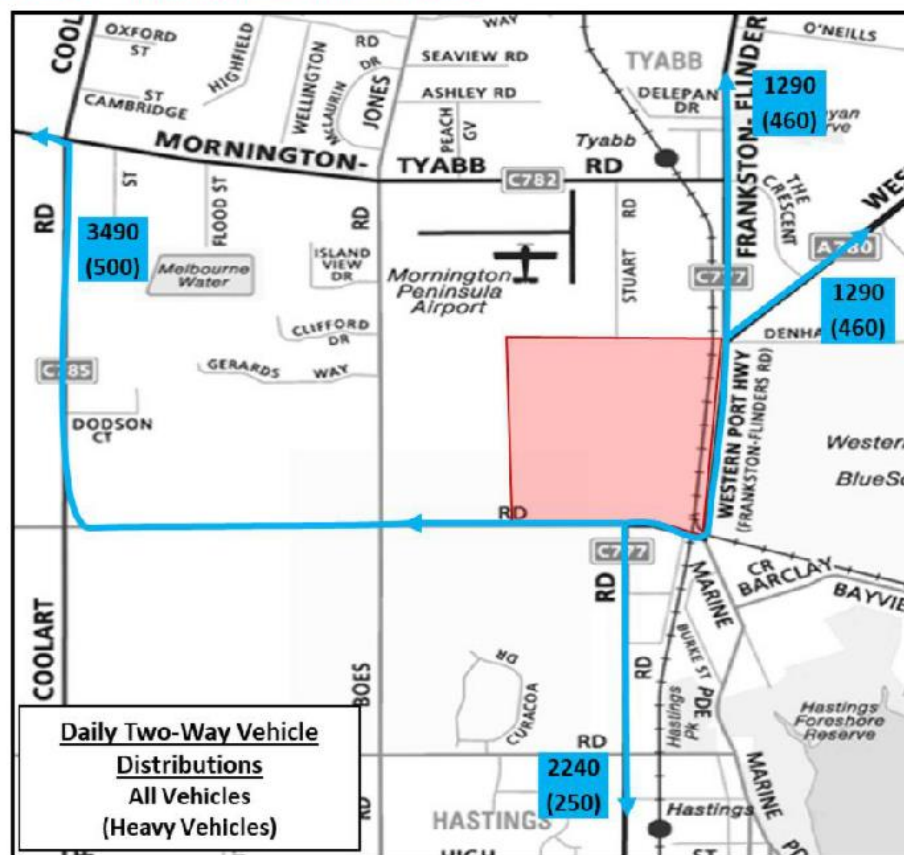


## 5.2 TRAFFIC AND DISTRIBUTIONS

### 5.2.1 ANTICIPATED DISTRIBUTIONS

Based on the traffic volume and distribution analysis undertaken in Section 2.2 and 2.3, Figure 5.2 has been prepared to show the anticipated traffic distributions (total vehicles and heavy vehicles) from the Hastings precinct. In preparing these distributions, it has been assumed that whilst generally taking the most direct path, where possible, any heavy vehicle movements will also typically travel along gazetted B-double approved roads.

Figure 5.2 Hastings Precinct - Traffic Distribution



### 5.2.2 IMPACTS

Based on the preceding distributions, the following possible impacts on surrounding towns have been noted:

- Somerville – 1,290 additional daily vehicle movements, including 460 heavy vehicles.
- Tyabb – 1,290 additional daily vehicle movements, including 460 heavy vehicles.
- Hastings – 2,240 additional daily vehicle movements, including 250 heavy vehicles.

Based on these additional traffic movements, further investigation is likely required to assess the impact that this would have on the operation of existing intersections and roads within proximity of the investigation area. It is also noted that these increased volumes may have impacts on existing amenity and liveability in these towns.



### 5.3 ROAD NETWORK

The road network within direct proximity of the precinct consists of:

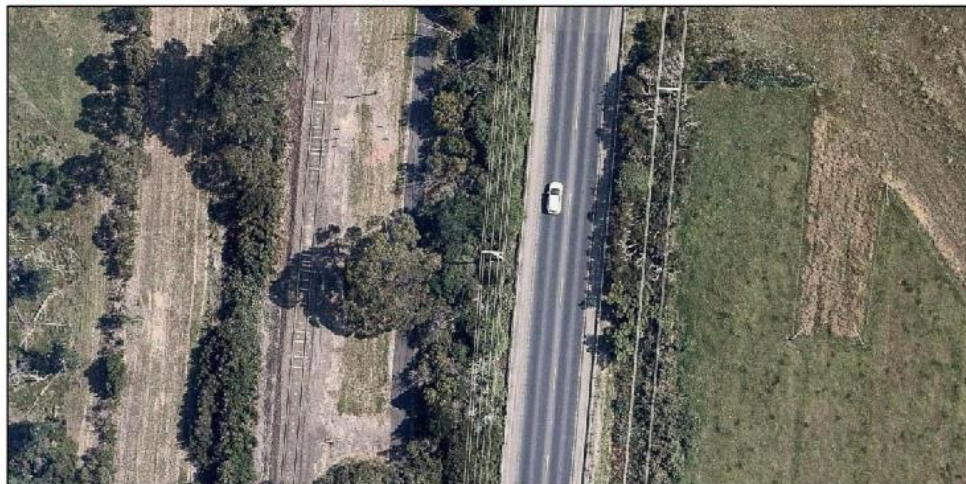
#### WESTERN PORT HIGHWAY/FRANKSTON-FLINDERS ROAD

Along the eastern frontage of the precinct, Western Port Highway/Frankston-Flinders Road is aligned in a north-south direction and is classified as a Road Zone 1. It currently comprises a single width carriageway, inclusive of sealed shoulders, and accommodates a single travel lane in each direction. Direct access to Western Port Highway/Frankston-Flinders Road from the precinct is restricted due to the railway line which is situated along the western side of the road reserve.

Western Port Highway/Frankston-Flinders Road is part of the VicRoads gazetted B-double route network, and based on visual review of the road, appears in adequate condition to continue operating in this arrangement.

The following figure shows the existing conditions along Western Port Highway/Frankston-Flinders Road proximate to the investigation area.

*Figure 5.3 Western Port Highway – Typical Existing Configuration*



Source: [www.nearmap.com.au](http://www.nearmap.com.au)

Further detailed investigation may however need to be conducted to ensure that the existing pavement depth and composition is adequate to support additional traffic and heavy vehicle movements.

VicRoads traffic volume data indicates that along the possible frontage of the precinct Western Port Highway/Frankston-Flinders Road is currently estimated to accommodate in the order of 16,000 two-way daily vehicle movements.

As per the distributions presented in Figure 5.2, it is anticipated that the industrial precinct would generate approximately 2,600 additional daily vehicle movements along Western Port Highway/Frankston-Flinders Road, increasing the total two-way daily traffic to approximately 18,600 vehicle movements.

Given that VicRoads estimations show that Western Port Highway/Frankston-Flinders Road is currently operating with traffic volumes at the upper end of operational capacity (15,000 – 18,000) that may trigger the need for duplication, it is considered that the increase in traffic as generated by the precinct, may warrant consideration to further upgrades of the existing road network to accommodate the additional traffic. This would also be subject to the undertaking of further detailed traffic analysis.



**GRAYDENS ROAD (FRANKSTON-FLINDERS ROAD)**

Graydens Road runs in an east-west alignment along the southern frontage of the investigation area and operates primarily as a secondary arterial road. The eastern section of the road is identified as the continuation of Frankston-Flinders road and is classified as a Road Zone 1 whilst the section to the west of Frankston Flinders Road is classified as a Road Zone 2 along the frontage of the precinct. It comprises a single width, line-marked carriageway with sealed shoulders allowing for two-way traffic flow.

Graydens Road operates as the primary access road to and from Hastings accommodating both typical and heavy vehicle movements. Based on visual inspection of the existing road, it appears that the road is in adequate condition to continue operating in this arrangement.

The following figure shows the existing conditions along Graydens Road.

*Figure 5.4 Graydens Road – Typical Existing Configuration*



Source: [www.nearmap.com.au](http://www.nearmap.com.au)

Further detailed investigation may however need to be conducted to ensure that the existing pavement depth and composition is adequate to support additional traffic and heavy vehicle movements.

VicRoads traffic volume data indicates that to the west of Frankston-Flinders Road, Graydens Road is currently estimated to accommodate in the order of 6,000 two-way daily vehicle movements whilst to the east along the section identified as Frankston-Flinders Road it is estimated to accommodate in the order of 16,000 two-way daily vehicle movements.

As per the distributions presented in Figure 5.2, it is anticipated that the industrial precinct would generate approximately 3,500 additional daily vehicle movements to the west and 2,600 additional daily vehicle movements to the east along Graydens Road/Frankston-Flinders Road, increasing the total two-way daily traffic to approximately 9,500 and 18,600 vehicle movements respectively.

Given that VicRoads estimations show that Frankston-Flinders Road to the east is currently operating with traffic volumes in excess of what is typically considered to be at the upper end of operational capacity (15,000 – 18,000) and that may trigger the need for duplication, it is considered that the increase in traffic as generated by the precinct, may warrant consideration to further upgrades of this section of the existing road to accommodate the additional traffic. This would also be subject to the undertaking of further detailed traffic analysis.

The volumes within the section of Graydens Road to west remain within the bounds of operational capacity (15,000) and is therefore anticipated that this section will continue to operate adequately with the post development volumes.



## 5.4 OTHER CONSIDERATIONS

### WESTERN PORT HIGHWAY/FRANKSTON-FLINDERS ROAD RE-ROUTE

Review of available street maps for the Hastings and Tyabb region indicates that at some point in time, consideration had been given to re-routing the alignment of Western Port Highway and Frankston-Flinders Road in order to provide a smoother path of travel and remove two 90-degree bends.

The alignment which was considered is shown in Figure 5.5.

Figure 5.5 Western Port Highway/Frankston-Flinders Road Re-Route



Source: <http://www.street-directory.com.au/>

Whilst at present investigations into this alignment indicate it is conceptual only, were it to be delivered it may provide additional road network connections and opportunities for the Hastings precinct.

### TRANSIT HUB (FREIGHT)

The Hastings precinct is well supported by a number of existing transport options which include:

- The airport to the north,
- Railway and potential future holdings yards to the east,
- Existing port facilities to the east,
- And the surrounding road connections including future upgrade options.

Given the provision of all 4 key freight transport modes (air, rail, sea, and road) and based on the existing and future nature of these facilities it is feasible that the Hastings precinct, when further developed for industrial use, could potentially operate as transit hub for freight distribution throughout the wider surrounding area and state.



## 5.5 OPPORTUNITIES AND CONSTRAINTS ASSESSMENT

With respect to the preceding considerations, Table 5.1 has been prepared providing an opportunities and constraints assessment for the Hastings precinct.

Table 5.1 Opportunities and Constraints Assessment - Hastings

OPPORTUNITIES	CONSTRAINTS
<b><u>Road Network Connectivity</u></b>	
— The precinct is surrounded by several B-double gazetted roads which will allow for distribution of traffic to the wider road network and peninsula.	— Graydens Road is not classified as a B-double gazetted road which may restrict future large vehicle access to and from the precinct.
<b><u>Precinct Access</u></b>	
—	— Precinct access can only be facilitated along a single frontage, potentially restricting possible future development opportunities and connections.
<b><u>Road Condition</u></b>	
— Existing road conditions within proximity of the precinct appear adequate to accommodate future demands of an industrial development.	—
<b><u>Precinct Location and Town Proximity</u></b>	
— The subject precinct is located within good proximity to Hastings and Tyabb providing convenient access for residents, but far enough away to potentially limit traffic impacts.	—
<b><u>Traffic Generation and Distribution</u></b>	
— The location of the precinct may allow for improved distribution of traffic in all directions with reduced impact on surrounding townships. <ul style="list-style-type: none"> <li>— Somerville – 1,290 vpd</li> <li>— Tyabb – 1,290 vpd</li> <li>— Hastings – 2,240 vpd</li> </ul> The impact on Tyabb is the least of all options.	
<b><u>Future Development and Road Network Upgrades</u></b>	
— Provision of the Frankston-Flinders Road re-route may provide future connection and development opportunities for the precinct.	— Roads within proximity of the precinct may require further detailed investigations in order to determine whether upgrades are required.
— Proximity of the precinct to surrounding transport modes may lend itself to future use as a freight transit hub for the wider area.	—
<b><u>Public Transport Connectivity</u></b>	
— Whilst currently there is no direct public transport access, the proximity of the precinct to an existing bus route could allow for this route to be diverted through the precinct, providing greater connectivity.	—



## 6. COMPARATIVE ASSESSMENT

Based on the benefits and constraints assessments undertaken for each of the investigation precincts, Table 6.1 has been prepared to present a weighted comparative assessment for of the possible precincts. The weighting in this assessment is based on the provision of 1 point for each opportunity and -1 point for each constraint. These have been summarised for each sub-category.

*Table 6.1 Comparative Assessment*

SUB-CATEGORY	PRECINCT 1 (SOMERVILLE)	PRECINCT 2 (TYABB)	PRECINCT 3 (HASTINGS)
1) Road Network Connectivity	0	0	0
2) Precinct Access	0	1	-1
3) Road Condition	-1	0	1
4) Precinct Location and Town Proximity	0	0	1
5) Traffic Generation and Distribution	-2	0	1
6) Future Development and Road Network Upgrades	0	0	1
7) Public Transport Connectivity	1	1	1
<b>Total</b>	<b>-2</b>	<b>2</b>	<b>4</b>



## 8. PREFERRED PRECINCT & SUMMARY

### 8.1 PREFERRED PRECINCT

Based on the preceding comparative assessment and analysis of the key identified traffic aspects that have been assessed, whilst there are benefits and constraints for each precinct, it is considered that overall of the 3 locations investigated from a traffic engineering perspective, the Hastings precinct would provide the preferred location for a future industrial precinct.

Key criteria that have been given consideration in identifying the Hastings precinct as the preferred precinct are:

- The precinct is well located with connection to an established surrounding road network that allows for an even distribution of traffic and reduced impact on nearby townships. Based on the presented distributions, this option has the overall least impact on nearby towns with almost 60% of traffic able to be distributed without impacting the nearby towns.
- Subject to detailed analysis, it is considered that the precinct would not require significant road or intersection upgrades in order to operate.
- The location of the precinct with respect to a variety of transport options may allow for future use of the precinct as a transit (freight) hub.

### 8.2 FURTHER WORKS

Based on the identification of a preferred precinct with reference to the outcome of all consultant reports, it is considered that further traffic investigations and studies will need to be undertaken in order to provide a detailed assessment of the chosen precinct and assess the impacts on the wider surrounding precinct. It is considered that this investigation would include the collection of detailed traffic data for the wider road network surrounding the precinct with allowance for detailed analysis of traffic generations and distributions and the resultant impacts on this road network.

Should you have any queries, or wish to discuss the above outcomes further, please do not hesitate to contact the undersigned.

Yours sincerely

A handwritten signature in black ink that reads 'Chris Hamond'. The signature is written in a cursive, flowing style.

Yours sincerely

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