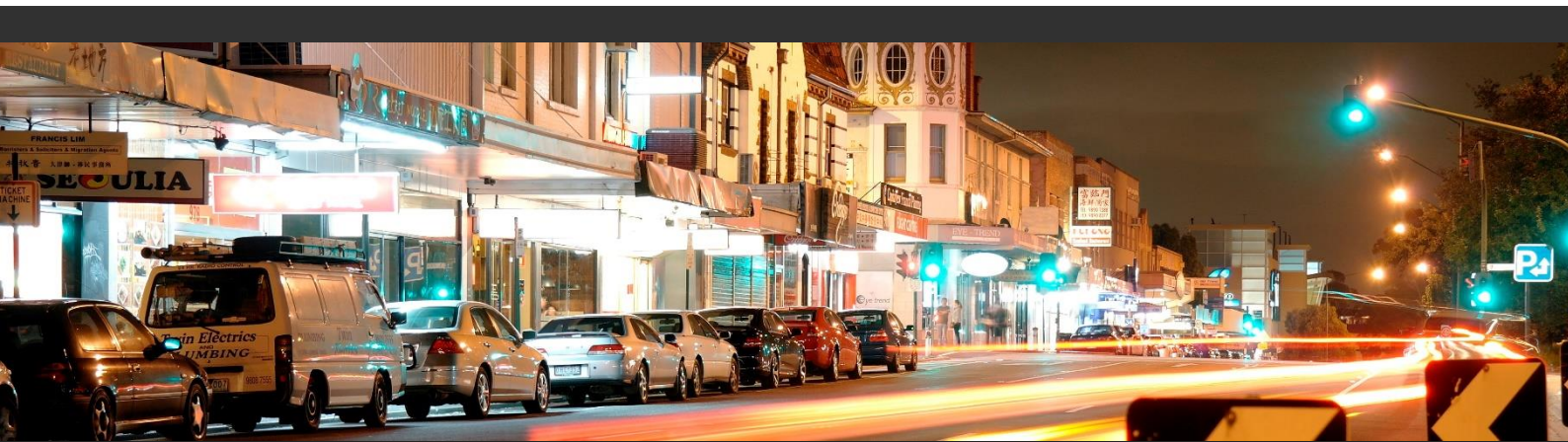


# ***Glen Eira Transformative Concepts***

## Transformative Concepts Review



170055TIA001F-F

8 March 2017

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### DOCUMENT INFORMATION

Prepared for	Planisphere		
File Name	170055TIA001F-F	Report Date	8 March 2017
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# 1 INTRODUCTION

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**onemilegrid** has been requested by Planisphere to undertake a review for Glen Eira City Council's Transformative Concepts.

The project scope is to review Council's Transformative Concepts, and advise and test traffic implications where applicable for the following centres:

- Carnegie;
- Murrumbeena;
- Hughesdale;
- Bentleigh; and
- Elsternwick.

As part of this assessment the subject areas have been inspected with due consideration of the key transformative concepts, traffic data has been sourced and relevant background reports have been reviewed.

## 2 CARNEGIE

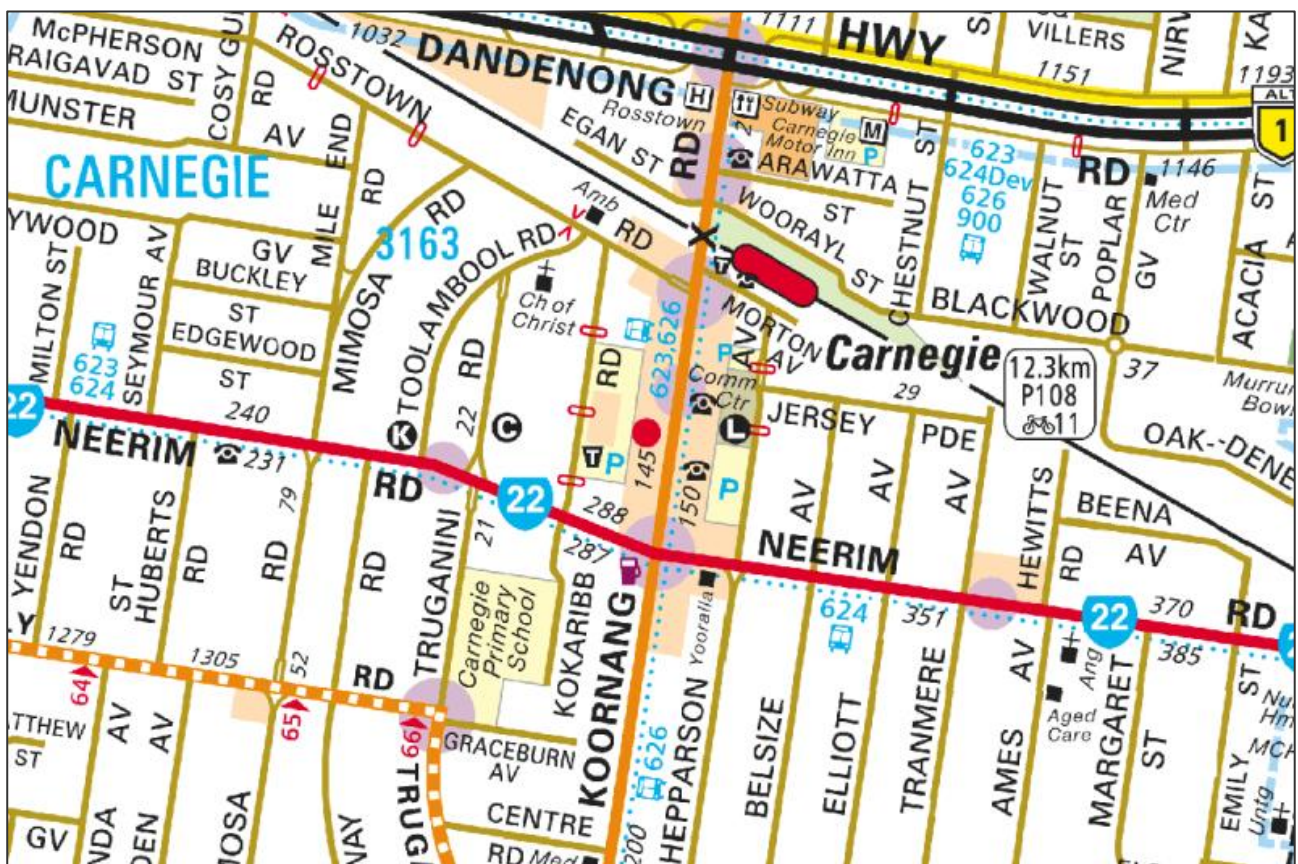
### 2.1 Existing Conditions

#### 2.1.1 Site Location

The subject area is located near and around the Carnegie Railway Station, as shown in Figure 1.

Land use in the vicinity of the subject area is mixed in nature, and includes commercial uses along Koornang Road, residential uses to the east and west of Koornang Road and public use areas such as car parks, the Carnegie Library and Carnegie Children's Multi-purpose Centre south of the train station.

**Figure 1 Site Location – Carnegie**



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## 2.1.2 Council Car Parks

There are 2 Council car parks located in the precinct as shown Figure 2 and Figure 3. The car park to the west of Koornang Road is accessed via Kokaribb Road and contains 75 car parking spaces. The car park to east of Koornang Road, which is directly south of Carnegie Library and Carnegie Children's Multi-purpose Centre, is accessed via Shepparson Avenue and contains 118 car parking spaces.

**Figure 2 Council Car Parks – Carnegie**





Figure 3 Aerial Image – Carnegie



### 2.1.3 Existing Traffic Conditions

In order to ascertain recent and accurate traffic data, **onemilegrid** commissioned Trans Traffic Surveys to conduct traffic movement counts at the following intersections:

- Koornang Road / Morton Avenue;
- Morton Avenue / Shepparson Avenue; and
- Shepparson Avenue / Neerim Road.

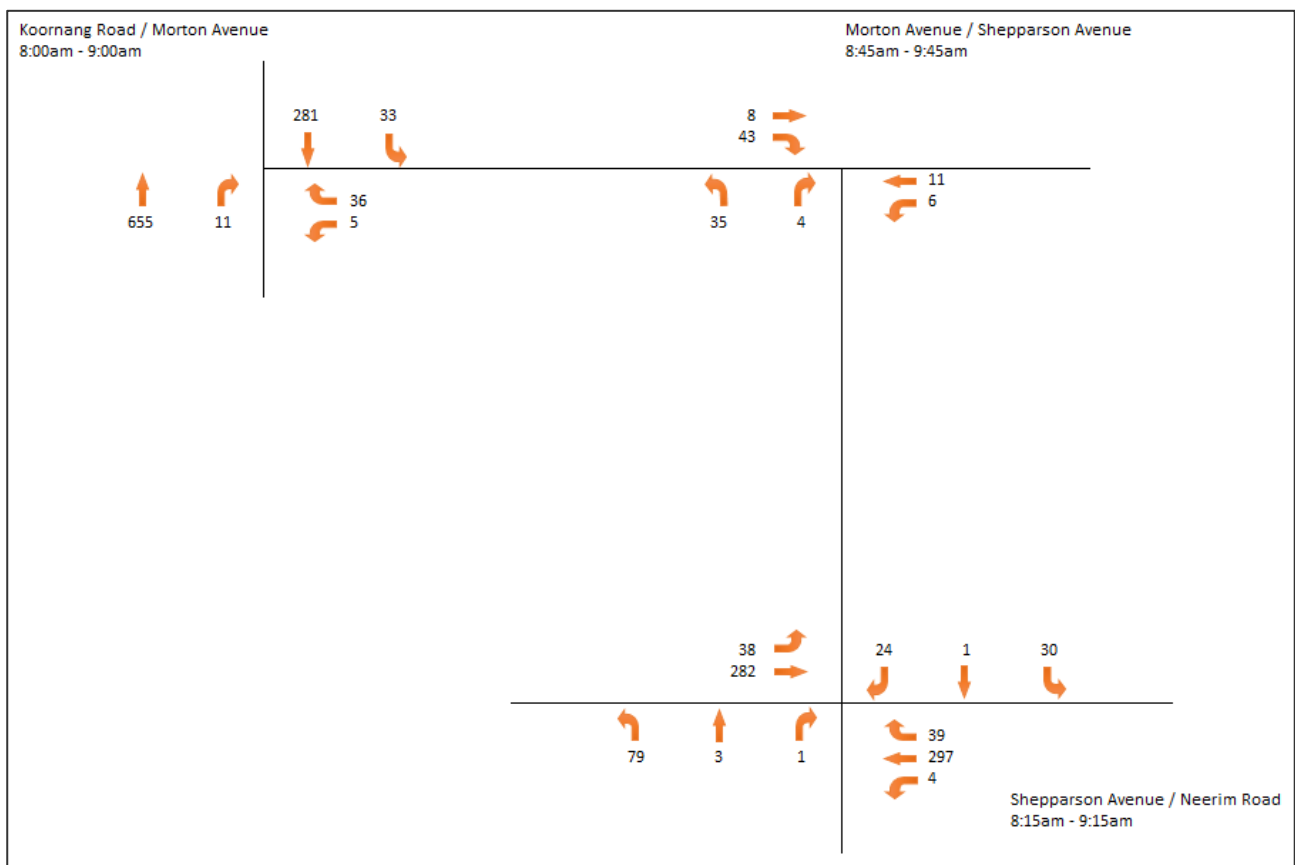
The turning movement counts were undertaken and recorded in 15 minute intervals on the following days and times:

**Table 1 Turning Movement Survey Times – Carnegie**

Day	Date	Time 1	Time 2	Interval
Tuesday	07/02/2017	7:00am – 10:00am	4:00pm – 7:00pm	15 minutes

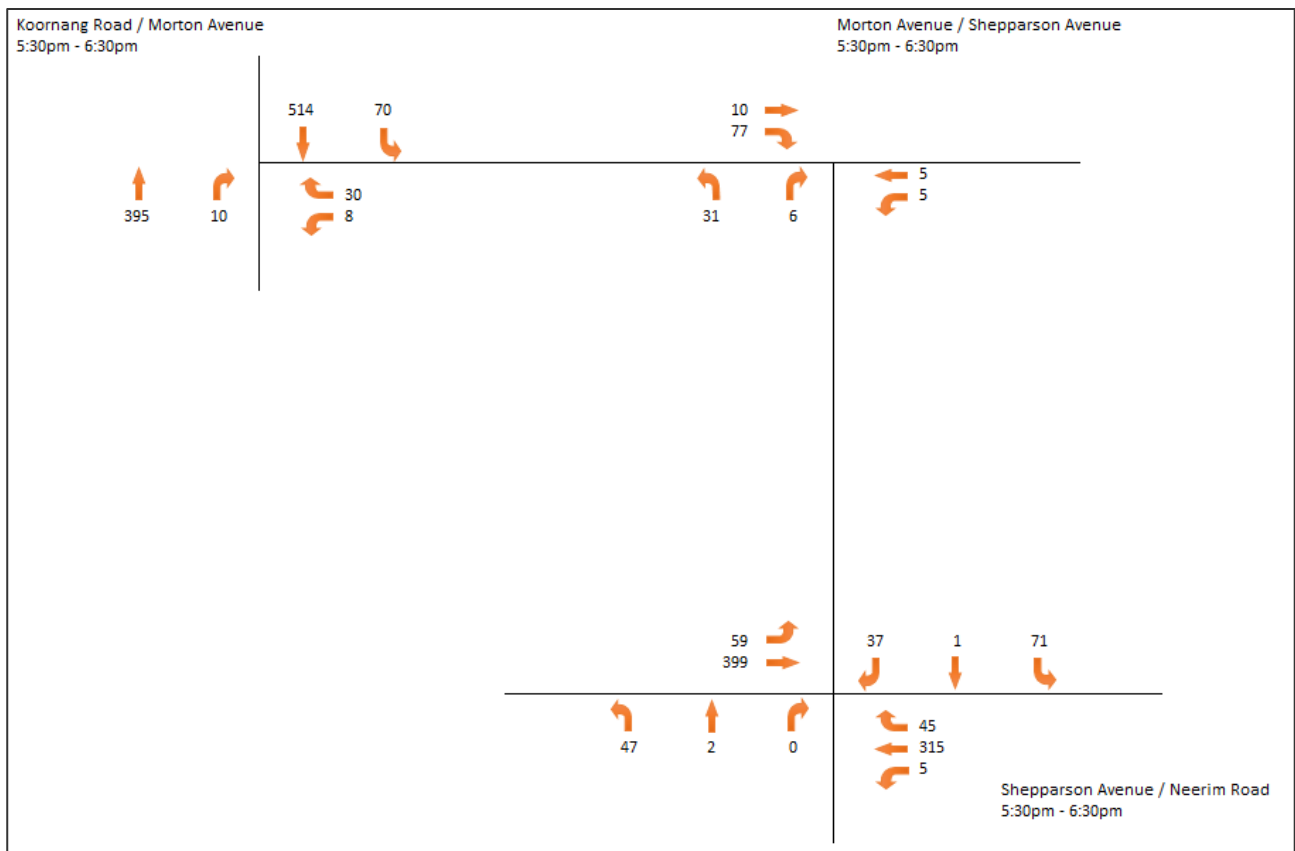
A summary of the AM peak hour counts for the primary intersections potentially impacted by works are shown in Figure 4. It should be noted that each intersection does not necessarily have the same AM peak hour.

**Figure 4 Carnegie Existing Traffic Volumes – AM Peak Hour**



A summary of the PM peak hour counts for the primary intersections potentially impacted by works are shown in Figure 5. It should be noted that each intersection does not necessarily have the same PM peak hour.

**Figure 5 Carnegie Existing Traffic Volumes – PM Peak Hour**



To assess the operation of the intersection the traffic volumes have been input into SIDRA Intersection, a traffic modelling software package.

The SIDRA Intersection software package has been developed to provide information on the capacity of an intersection with regard to a number of parameters. Those parameters considered relevant are, Degree of Saturation (DoS), 95th Percentile Queue, and Average Delay as described below.



**Table 2 SIDRA Intersection Parameters**

Parameter	Description														
Degree of Saturation (DoS)	The DoS represents the ratio of the traffic volume making a particular movement compared to the maximum capacity for that particular movement. The value of the DoS has a corresponding rating, as specified within the SIDRA manual, depending on the ratio as shown below.														
	<table><tr><th>Degree of Saturation</th><th>Rating</th></tr><tr><td>Up to 0.60</td><td>Excellent</td></tr><tr><td>0.61 – 0.70</td><td>Very Good</td></tr><tr><td>0.71 – 0.80</td><td>Good</td></tr><tr><td>0.81 – 0.90</td><td>Fair</td></tr><tr><td>0.91 – 1.00</td><td>Poor</td></tr><tr><td>Above 1.00</td><td>Very Poor</td></tr></table>	Degree of Saturation	Rating	Up to 0.60	Excellent	0.61 – 0.70	Very Good	0.71 – 0.80	Good	0.81 – 0.90	Fair	0.91 – 1.00	Poor	Above 1.00	Very Poor
	Degree of Saturation	Rating													
	Up to 0.60	Excellent													
	0.61 – 0.70	Very Good													
	0.71 – 0.80	Good													
	0.81 – 0.90	Fair													
	0.91 – 1.00	Poor													
Above 1.00	Very Poor														
It is noted that whilst the range of 0.91 – 1.00 is rated as 'poor', it is acceptable for critical movements at an intersection to be operating within this range during high peak periods, reflecting actual conditions in a significant number of suburban signalised intersections.															
Average Delay (seconds)	Average delay is the time delay that can be expected for all vehicles undertaking a particular movement in seconds.														
95th Percentile (95%ile) Queue	95%ile queue represents the maximum queue length in metres that can be expected in 95% of observed queue lengths in the peak hour														

The results of the existing conditions analysis for Carnegie is provided in Appendix A.

The results show that all intersections analysed are currently operating under 'excellent' conditions during both the morning and afternoon peak hours with minimal queues and delays experienced by motorists.

## 2.2 Transformative Concepts

### 2.2.1 Council Car Park Development

It is understood that Council has proposed to transform one of the existing car parks within the precinct in order to create a new centralised green park that encourages public interaction. Along with this, more public car parking is desired within one centralised car parking structure that includes a permanent market on the ground floor of the car park, a rooftop public multi-purpose recreational facility and a smaller green space on the ground floor.

A review of the points of consideration and subsequent recommendations to the transformative concepts are shown in Table 3 below.

**Table 3 Carnegie – Council Car Park Development**

	<i>Points for consideration</i>	<i>Recommendation</i>
Develop the two Council owned car parks to create a new centralised large green park.	The west car park contains approximately 70 car parking spaces, the east car park contains approximately 124 car parking spaces.	It is suggested that the east car park has the better development opportunity due to its larger footprint and the potential fewer levels required to provide adequate car parking spaces.
More public car parking within one centralised car parking structure, with:	Car parking must be provided to accommodate the spaces lost due to the closure of the other Council car park as well as the demand generated by the new uses, which can be determined once floor areas are finalised. It is noted that the area required for 1 car parking space and appropriate access and circulation is approximately 30m <sup>2</sup> .	The new centralised parking structure would be multistorey and can be integrated into a built form of the multipurpose structure to improve the public amenity compared to a standalone parking facility.
➤ Permanent market on ground floor;	The west car park is the smaller of the two car parks and therefore it potentially would require more levels to accommodate the required car parking spaces.	
➤ Rooftop public multi-purpose recreational facility; and	In order to accommodate car parking and additional facilities a multistorey building will be required.	Vehicle access to the multipurpose structure would be maintained from Shepparson Avenue.
➤ Smaller green space on the ground floor.		

Appropriate pedestrian laneway connections from Koornang Road to these new facilities	<p>Both car parks are already accessible from Koornang Road via pedestrian links located adjacent to the Koornang Road signalised pedestrian crossing, although the east car park does not have direct pedestrian access from Koornang Road, rather access is provided via a back of house service laneway.</p> <p>It is likely that land acquisition would be required to provide a more direct connection between Koornang Road and the eastern car park.</p>	It would be desirable to provide additional pedestrian links from Koornang Road to the multipurpose structure.
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## 2.2.2 Pedestrian Friendly Laneway Network

It is proposed to create a pedestrian friendly street and laneway network by exploring a variety of options that involve alterations to Morton Avenue.

A review of the points of consideration and subsequent recommendations to the transformative concepts are shown in Table 4 below.

**Table 4 Morton Avenue Alterations**

	<i>Points for consideration</i>	<i>Recommendation</i>
Full closure west of Shepparson Avenue	<p>A number of properties take their vehicle access from this section of Morton Avenue. These access points would need to be maintained.</p> <p>Waste collection arrangements for buildings fronting this section of street would need to be confirmed, and appropriate arrangements would need to be made.</p> <p>It is understood that following the completion of the grade separation works, no railway station car park access will be provided from Morton Avenue. Instead, access to railway station car park will be provided via Woorayl Street.</p>	<p>It is suggested that a Shared Zone would be the most suitable arrangement for this location.</p> <p>There are a number of properties to which access needs to be maintained, which could be achieved under the Shared Zone arrangement.</p>
One-way with extended footpath on southern side (maintain eastbound traffic operation)	<p>Evidence of rat-running in the PM peak hour, with vehicles utilising Morton Avenue and Shepparson Road to travel between Koornang Road and Neerim Road. Maintaining an eastbound lane on Morton Avenue would allow this to continue.</p> <p>It is understood that following the completion of the grade separation works, no railway station car park access will be provided from Morton Avenue. Instead, access to railway station car park will be provided via Woorayl Street.</p>	<p>It is expected that the low-speed environment provided by the shared zone will discourage rat-running in both directions.</p> <p>There is opportunity to make Morton Avenue one-way as well as a shared zone. In this instance, it is preferable</p>

One-way with extended footpath on southern side (maintain westbound traffic operation)	<p>Evidence of rat-running from Neerim Road to Koornang Road during the AM peak hour, although less so than occurs in the opposite direction during the PM peak hour. This arrangement would prevent the PM peak hour rat-running but have little impact on rat running in the opposite direction.</p> <p>It is understood that following the completion of the grade separation works, no railway station car park access will be provided from Morton Avenue. Instead, access to railway station car park will be provided via Woorayl Street.</p>	to maintain westbound traffic operation to ensure no rat-running in the PM peak hour in the eastbound direction which is more critical than the AM peak hour.
Shared space two-way	<p>Shared Zone would provide pedestrian priority within a low speed environment (speed limit of 10 km/h) while maintaining current level of accessibility for land uses in the area.</p> <p>Low speed limit within the Shared Zone would likely discourage rat-running</p>	

### 2.2.3 Tram Line Extension

It is sought to extend the existing tram network (routes 3 & 67) to create a tram route along Koornang Road to Carnegie Station, as shown in Figure 6.

This would improve public transport system to the precinct with greater connectivity between train, tram and bus services.

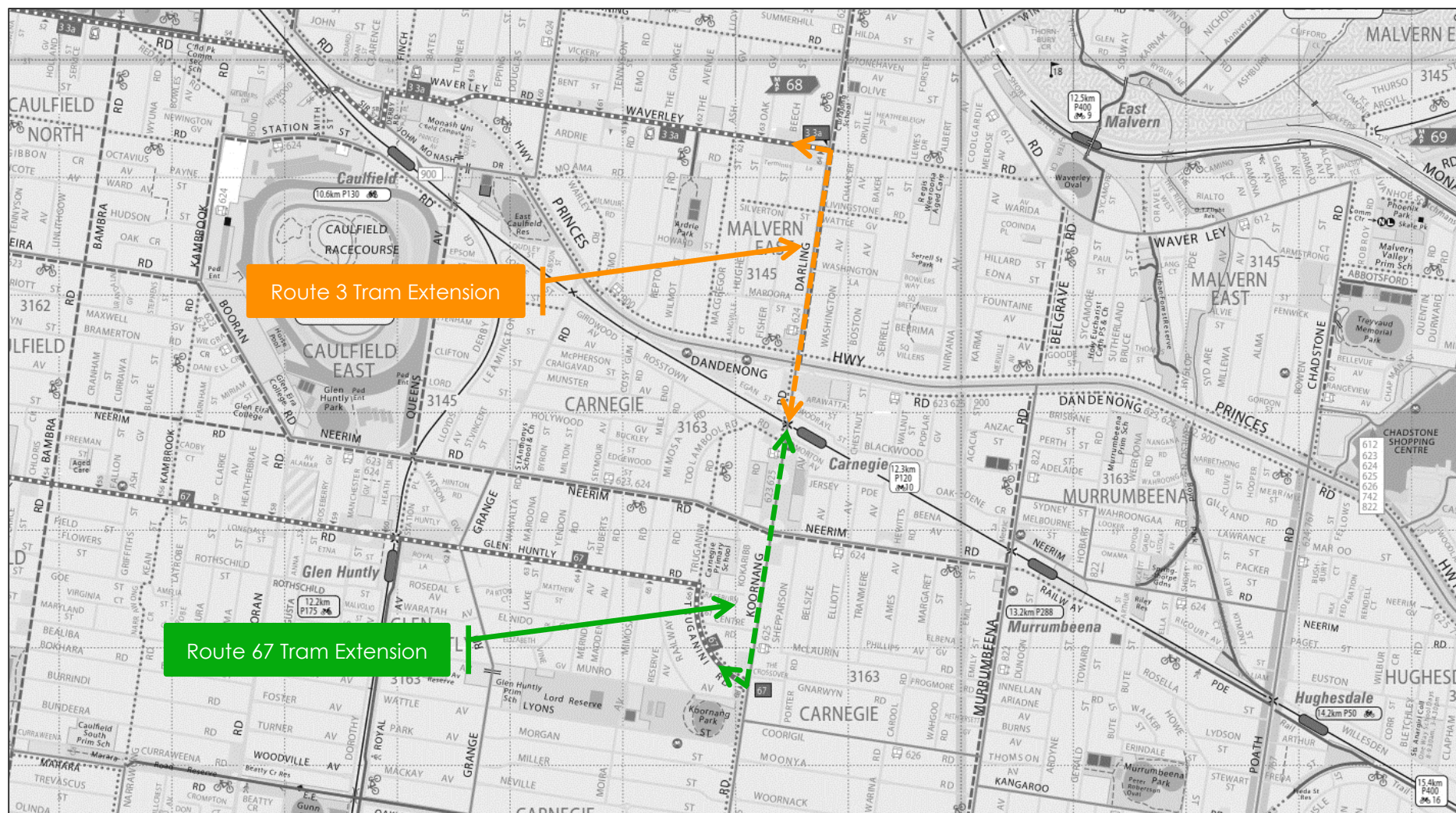
Koornang Road is currently a two-lane two-way road for the majority of the section proposed to be shared with a new tram line. In order to facilitate a new tram line, a mixed-use road would have to be constructed, whereby vehicles and trams share the same lane.

All new trams stops would need to be DDA compliant and at regular intervals along Koornang Road.

Intersection and traffic signals along the route extensions would need to be modified to accommodate tram movements.



**Figure 6 Tram Line Extension**



## 3 MURRUMBEENA

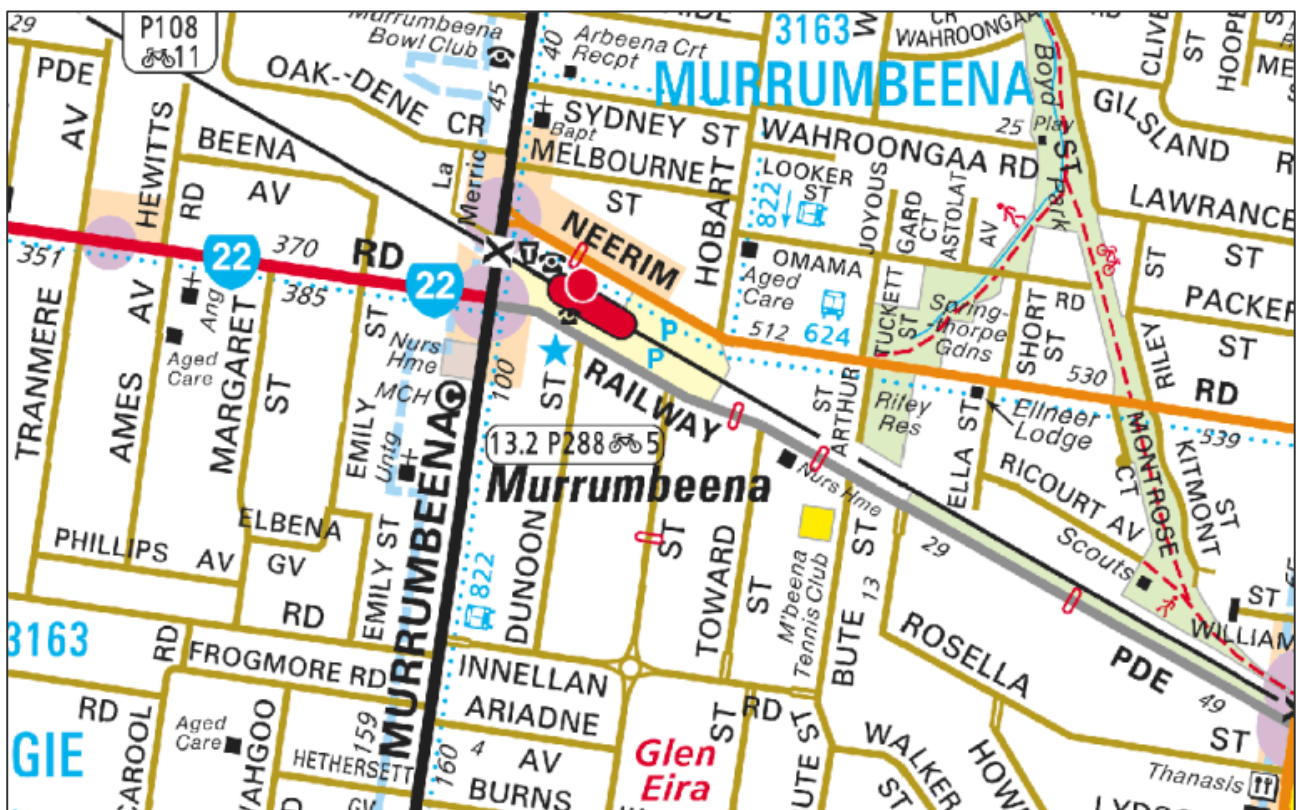
### 3.1 Existing Conditions

#### 3.1.1 Site Location

The subject area is located near and around the Murrumbeena Railway Station, as shown in Figure 7 and Figure 8.

Land use in the immediate vicinity of the site is mixed in nature, and primarily includes residential uses in Murrumbeena as well as a commercial cluster around Murrumbeena Railway Station and railway car parking either side of the train tracks.

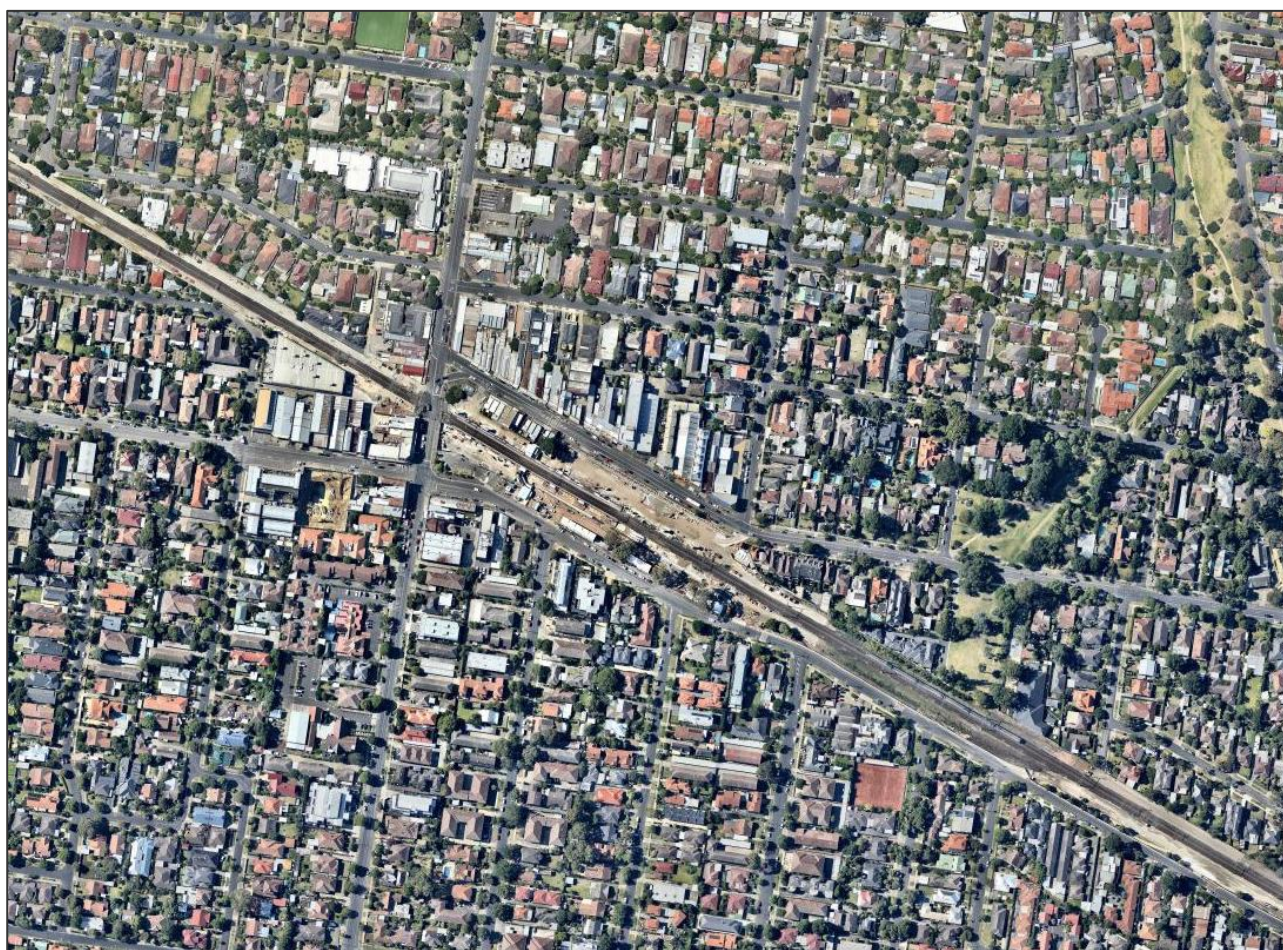
**Figure 7 Site Location – Murrumbeena**



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**Figure 8**     **Aerial Image – Murrumbeena**



### 3.1.2 Existing Traffic Conditions

In order to ascertain recent and accurate traffic data, **onemilegrid** commissioned Trans Traffic Surveys to conduct traffic movement counts at the following intersections:

- Neerim Road / Murrumbeena Road;
- Murrumbeena Road / Melbourne Street;
- Melbourne Street / Hobart Road; and
- Hobart Road / Neerim Road.

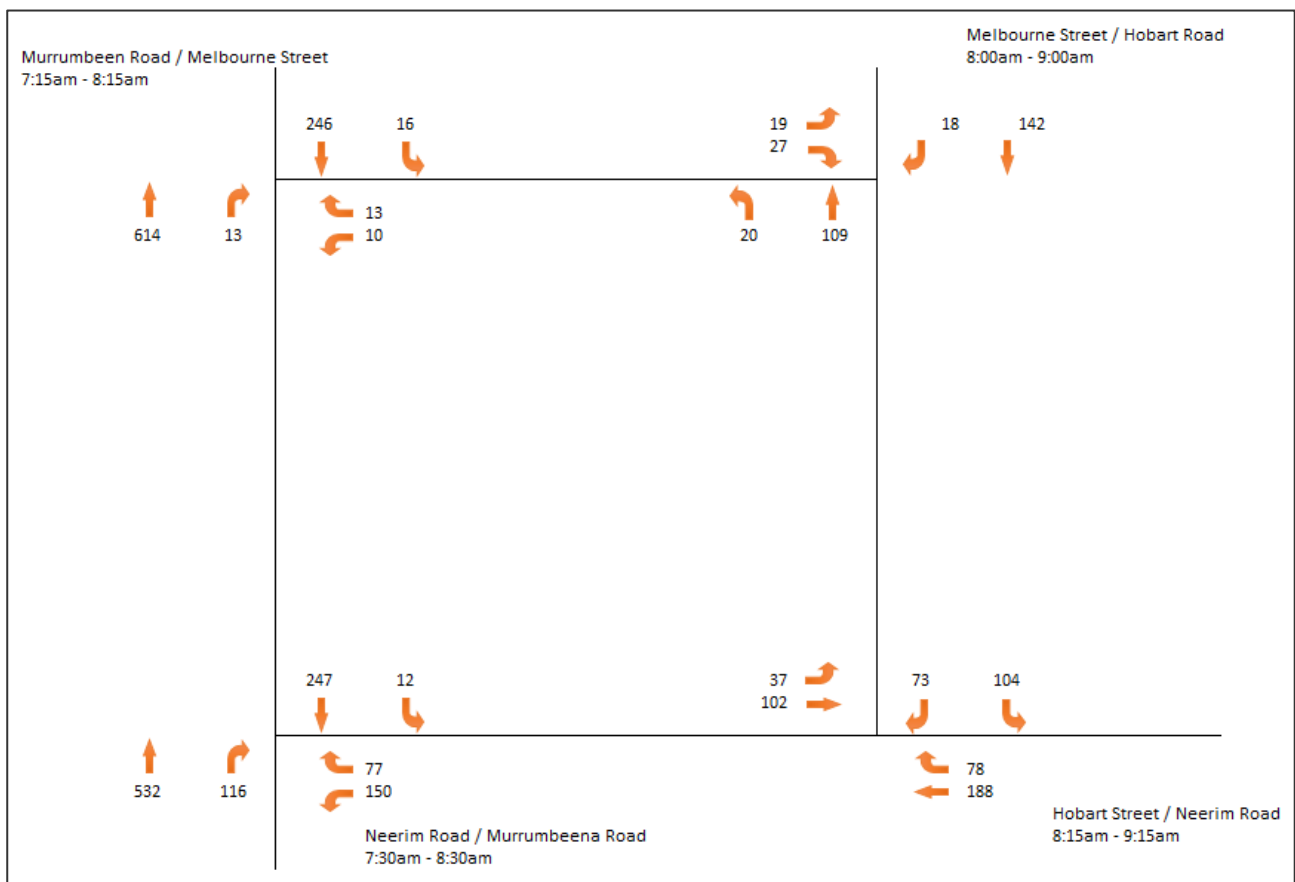
The turning movement counts were undertaken and recorded in 15 minute blocks on the following days and times:

**Table 5 Turning Movement Survey Times – Carnegie**

Day	Date	Time 1	Time 2	Interval
Tuesday	07/02/2017	7:00am – 10:00am	4:00pm – 7:00pm	15 minutes

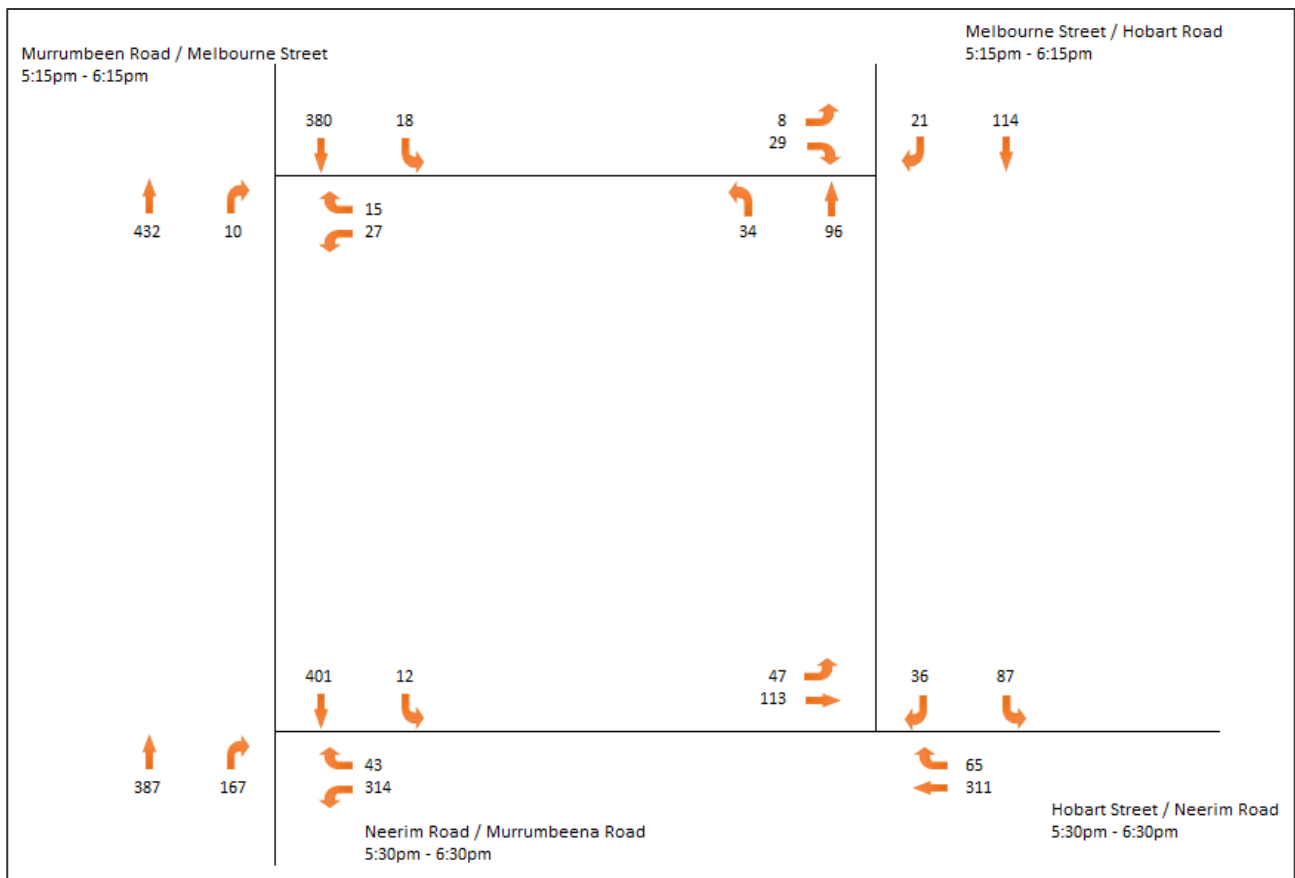
A summary of the AM peak hour counts for the major intersections surrounding the subject area is shown in Figure 9. It should be noted that each intersection does not necessarily have the same AM peak hour.

**Figure 9 Murrumbeena Existing Traffic Volumes – AM Peak Hour**



A summary of the PM peak hour counts for the major intersections surrounding the subject area is shown in Figure 10. It should be noted that each intersection does not necessarily have the same PM peak hour.

**Figure 10 Murrumbeena Existing Traffic Volumes – PM Peak Hour**



To assess the operation of the intersection the traffic volumes have been input into SIDRA Intersection, a traffic modelling software package.

The results of the existing conditions analysis for Murrumbeena is provided in Appendix B.

The results show that all intersections analysed are currently operating under 'excellent' conditions during both the morning and afternoon peak hours with minimal queues and delays experienced by motorists.

## 3.2 Transformative Concepts

### 3.2.1 Pedestrianise Neerim Road

It is proposed to transition Neerim Road to a pedestrian friendly area between Murrumbeena road and Hobart Street by diverting car routes, improving pedestrian accessibility and creating spaces for social and casual recreation.

A review of the points of consideration and subsequent recommendations to the transformative concepts are shown in Figure 6 below.

**Table 6 Neerim Road**

	<i>Points for consideration</i>	<i>Recommendation</i>
Full closure	<p>The arrangement would provide a full pedestrian mall, improving pedestrian amenity.</p> <p>There are a number of properties that take vehicle access from this section of road. These access points would need to be maintained.</p> <p>All traffic would be diverted to the neighbouring intersections; in particular Melbourne Street, Railway Parade and Hobart Street, or via the proposed new Link Road discussed in Section 3.2.3.</p>	<p>It is suggested that a one-way shared zone would be the most appropriate treatment for this section of Neerim Road. It will provide a pedestrianised, low volume and speed environment whilst maintaining local vehicle access.</p>
One-way with extended footpath (maintain eastbound traffic operation)	<p>Traffic movements counts conducted at the intersection surrounding this section of Neerim Road indicate there is capacity for vehicles to be redistributed without having significant impact on road network capacity.</p> <p>There would be scope to provide a one-way eastbound arrangement at this portion of Neerim Road, and widen the footpath on either side of the road.</p>	<p>Maintaining eastbound movements is considered to be the most appropriate one-way treatment as it is likely to encourage vehicles to exit the area via the proposed Link Road and the Railway Parade / Murrumbeena Road signals.</p>
One-way with extended footpath (maintain westbound traffic operation)	<p>Traffic movements counts conducted at the intersection surrounding this section of Neerim Road indicate there is capacity for vehicles to be redistributed without having significant impact on road network capacity.</p> <p>There would be scope to provide a one-way eastbound arrangement at this portion of Neerim Road, and widen the footpath on either side of the road.</p>	<p>It is suggested to install local area traffic management measures to keep through traffic out of residential streets.</p>
Shared space two-way	<p>Shared Zone would provide pedestrian priority within a low speed environment (speed limit of 10 km/h) while maintaining current level of accessibility for land uses in the area.</p> <p>Low speed environment will likely reduce traffic movements along that section of Neerim Road.</p>	<p>If Neerim Road is to be downgrade to improve pedestrian amenity, it is suggested to remove car park access from Neerim Road.</p>



### **3.2.2 Bicycle Connection to Boyd Reserve**

Boyd Reserve is located to the east of Murrumbeena Railway Station and currently has an off road shared path that extends through the park and ends near the northern side of the intersection between Neerim Road and Tucker Street.

There is an opportunity to extend this shared path to the south of Neerim Road and along the rail alignment. This would provide a connection from the shared path to on road bicycle lanes along Murrumbeena Road and improve bicycle connectivity within the precinct.

### **3.2.3 Link Road**

It is proposed to construct a new Link Road between Neerim Road north and Railway Parade as part of the works at Murrumbeena Road and Murrumbeena Station. The Link Road proposed to connect Neerim Road and Railway Parade between Hobart Street and Ardyne Street underneath the raised rail line.

The Level Crossing Removal Authority reviewed the proposed Link Road and predicted the anticipated traffic distribution that would occur once the Link Road was constructed.

In relation to the construction of the Link Road between Hobart Road to Ardyne Street, several treatment options have been considered in the area to prevent potential rat-running between Dandenong Road and Kangaroo Road via Hobart Street, the new Link Road and Ardyne Street.

A review of the points of consideration and subsequent recommendations to the treatment options are shown in Table 7 below.

**Table 7 Ardyne Street, Dunoon Street, Hobart Road & Link Road**

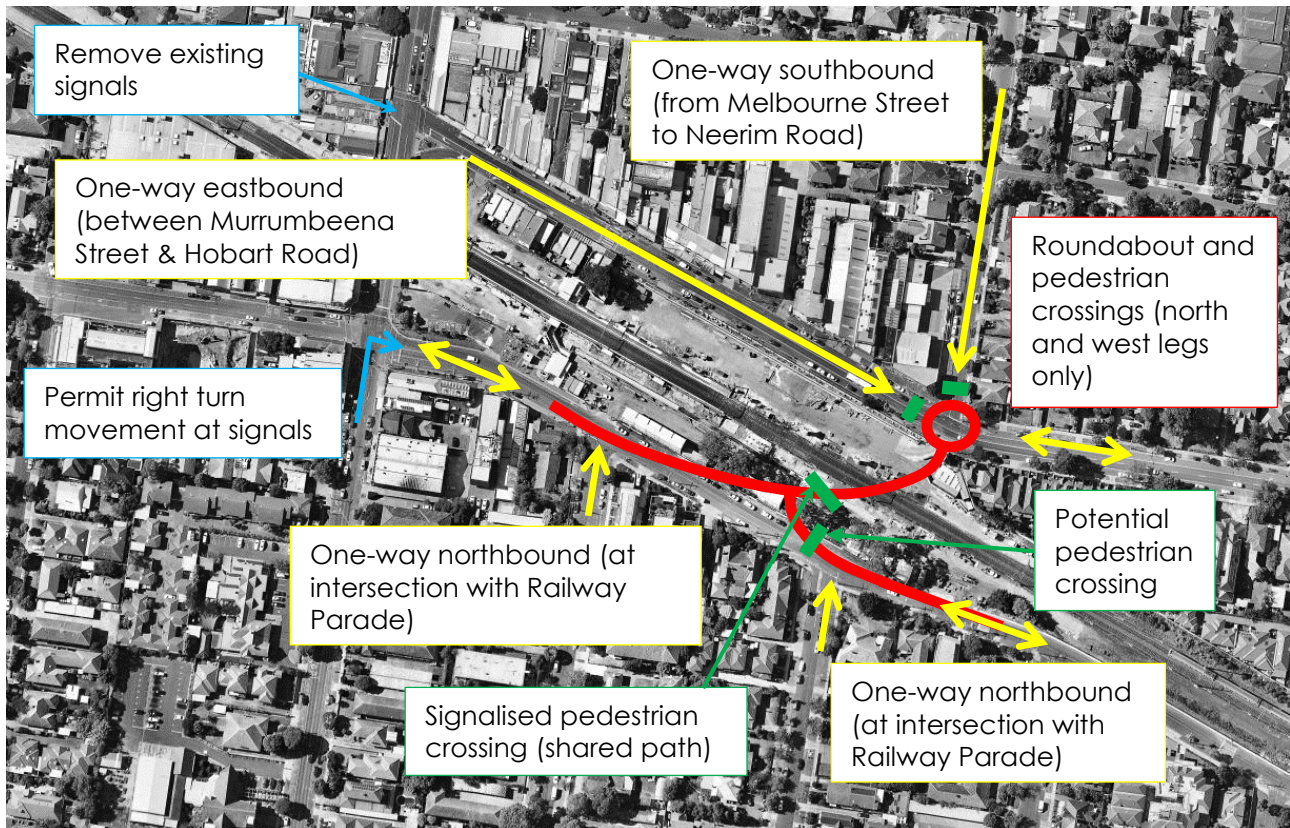
	<i>Points for consideration</i>	<i>Recommendation</i>
Restrict southbound movement with signalised intersection at Ardyne Street and the new Link Road	This arrangement would prevent north to south rat-running in Ardyne Street but would do little to deter south to north movements unless coupled with other measures.	It is suggested to limit the Ardyne Street intersection to one-way northbound from Ardyne Street onto Railway Parade (and the same for the Dunoon Street / Railway Parade intersection).
Restrict access from the new Link Road to Ardyne Street through constructing a raised median island and banning northbound movements from Ardyne Street	This arrangement could be difficult to design as a raised median would have to restrict movements to Ardyne Street whilst simultaneously allowing right turn movements from the Link Road. May not be practically achievable.	To prevent rat-running from Kangaroo Road to Dandenong road it is suggested that a mid-block partial closure (one-way southbound only) on Hobart Road, between Melbourne Street and Omama Road could be implemented. The option of extending the one-way southbound portion of Hobart Road between Melbourne Street and Neerim Road could also be considered.
Restrict southbound movements by closing southbound entry to Ardyne Street and Dunoon Street	<p>This could prevent rat-running in the south direction, however the option is still available via Toward Street and Gerald Street.</p> <p>This arrangement will restrict resident access from Railway Parade for properties along Ardyne Street and Dunoon Street, however alternative routes for local access are available.</p>	
Close vehicular entry from Railway Parade to Ardyne Street and Dunoon Street	<p>This would prevent rat-running via these street, but would also affect local access for residents.</p> <p>A turnaround area would need to be provided at the north end of Ardyne Street and Dunoon Street.</p>	It is suggested to install a roundabout at the intersection of Hobart Road / Link Road / Neerim Road to improve pedestrian accessibility to amenities such as Boyd Reserve. The location of pedestrian crossings should be limited to the north and west legs of the roundabout only particularly considering the suggested eastbound Shared Zone arrangement of Neerim Road west of the intersection.
Install roundabout with raised pedestrian crossings and with a mid-block closure along Hobart Road	<p>A roundabout would improve pedestrian accessibility to amenities such as Boyd Reserve.</p> <p>Mid-block closure would ensure no rat-running from Kangaroo Road to Dandenong Road in the AM peak hour.</p> <p>This arrangement would result in traffic continuing to utilise Murrumbeena Road for southbound trips.</p>	



Install roundabout with raised pedestrian crossings and restricted access to Hobart Road	<p>A roundabout would improve pedestrian accessibility to amenities such as Boyd Reserve.</p> <p>This arrangement would result in traffic continuing to utilise Murrumbeena Road, particularly north</p>	It is suggested to provide a reverse priority T intersection at Railway Parade / Link Road with Railway Parade (west) connecting to the Link Road (north) as the priority movement.
Install roundabout with pedestrian crossing on all approaches	<p>This arrangement would improve pedestrian connectivity within the precinct.</p>	To facilitate the above treatments, it is recommended to permit right turning vehicles at the signalled intersection of Murrumbeena Road and Railway Parade, and to remove the traffic signals at the Murrumbeena Road / Neerim Road intersection.
Install roundabout with pedestrian crossing along the north and west approaches only at Neerim Road / Link Road / Hobart Street	<p>A roundabout would improve pedestrian accessibility to amenities such as Boyd Reserve.</p> <p>This arrangement would not impact of the primary movements of the roundabout.</p>	

A diagram representing the recommended street treatments for Murrumbeena outlined in Table 7 has been shown in Figure 11 below.

**Figure 11 Murrumbeena Street Treatment Recommendation**



### 3.3 Beena Avenue & Emily Street

A review of the points of consideration and subsequent recommendations to the transformative concepts are shown in Table 8 below.

**Table 8 Beena Avenue / Emily Street**

	<i>Points for consideration</i>	<i>Recommendation</i>
Full closure of Beena Avenue / Emily Street adjacent to railway land	<p>Turnaround areas would need to be provided at both dead ends.</p> <p>This arrangement would result in reduced access and street circulation for local residents.</p>	It is possible to make this section of Beena Avenue / Emily Street one-way in either direction. However it is expected that the gains would be minimal.
One-way (maintain east-south traffic operation)	<p>If made one-way along this section, the entirety of Beena Avenue / Emily Street would need to also be made one-way.</p> <p>Minimal gains would be seen if implemented.</p>	
One-way (maintain north-west traffic operation)	<p>If made one-way along this section, the entirety of Beena Avenue / Emily Street would need to also be made one-way.</p> <p>Minimal gains would be seen if implemented.</p>	



## 4 HUGHESDALE

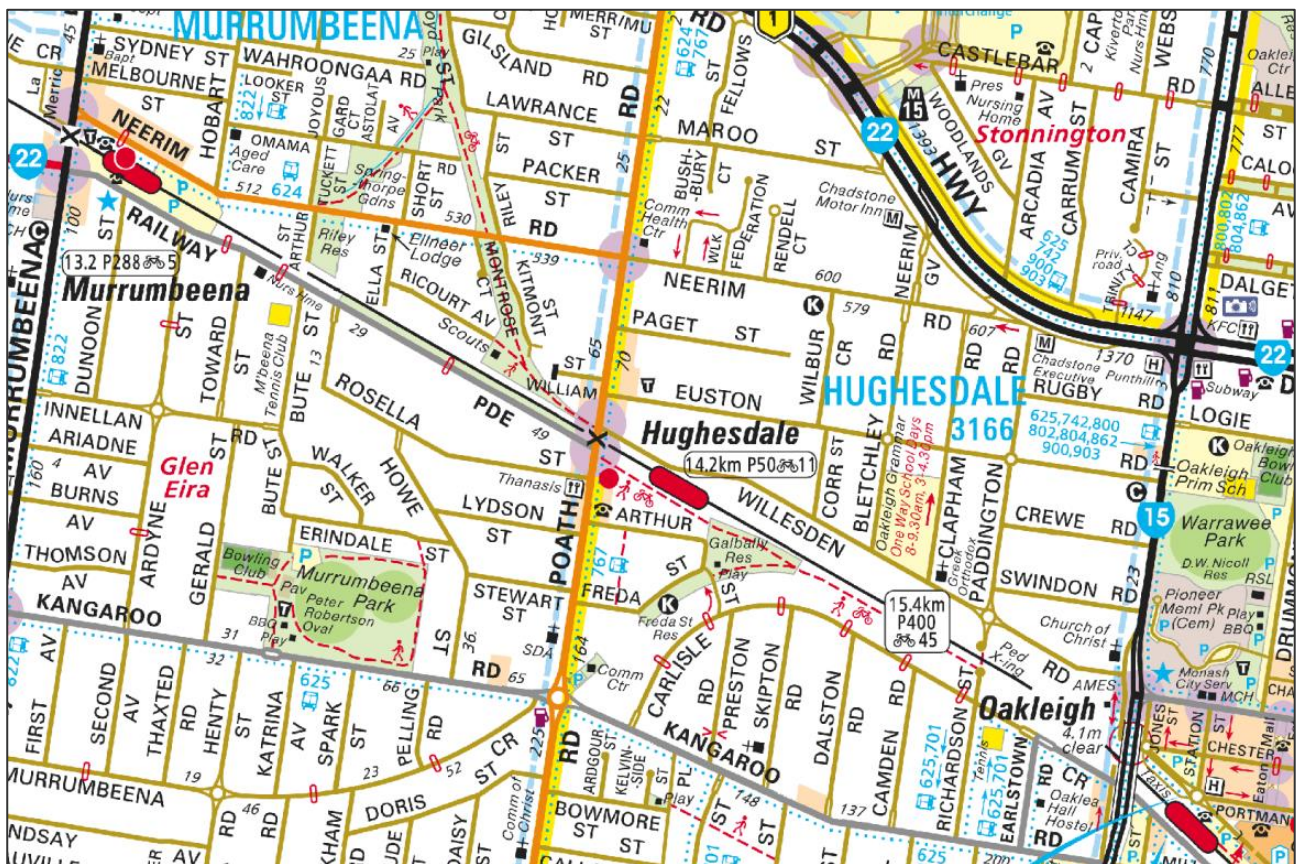
### 4.1 Existing Conditions

#### 4.1.1 Site Location

The subject area is located near and around Hughesdale Railway Station, as shown in Figure 14.

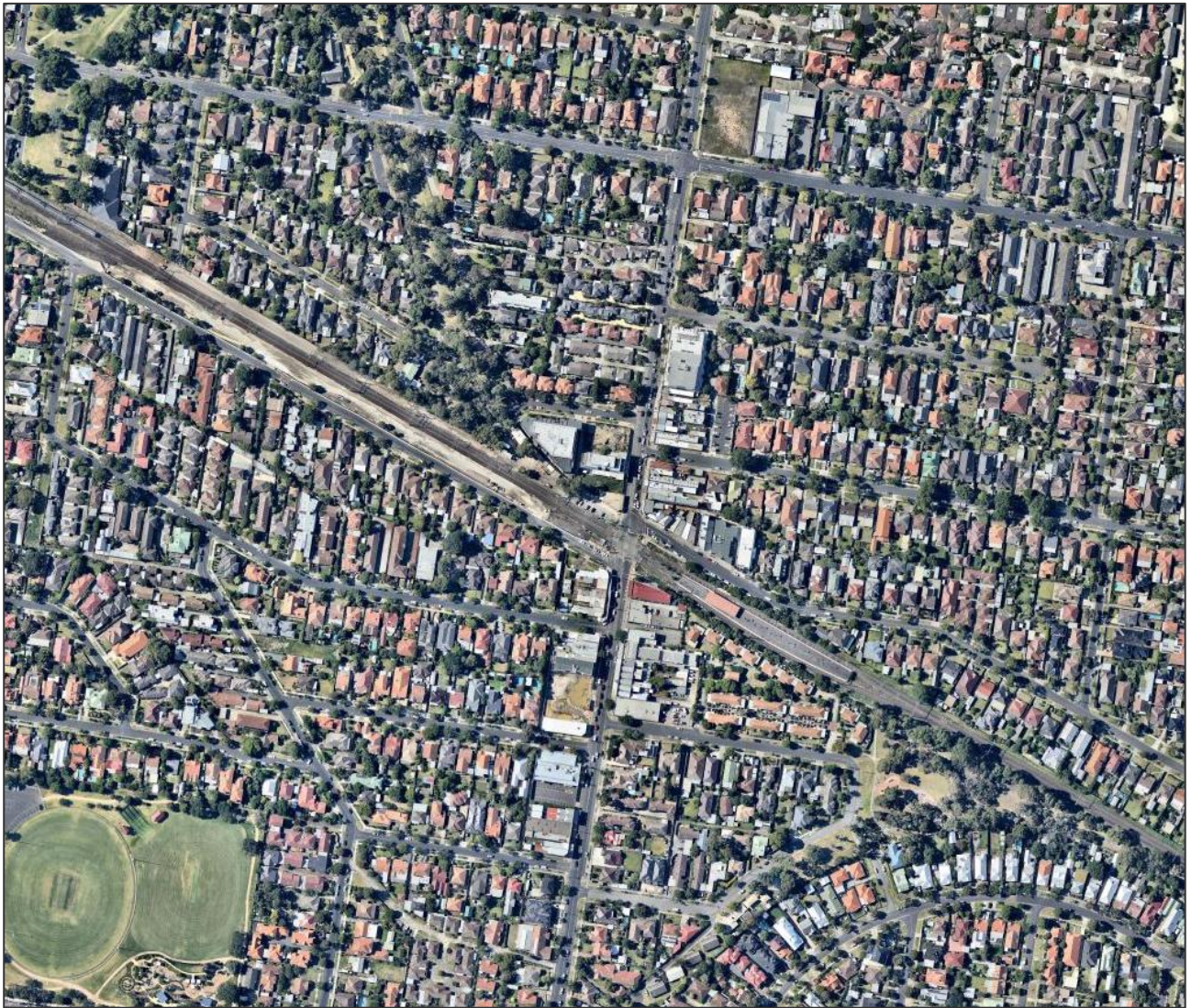
Land use in the immediate vicinity of the site is mixed in nature, and includes several commercial shops along Poath Road, residential uses to the north and south of the train tracks and Boyd Park which runs northwest from William Street.

**Figure 12 Site Location – Hughesdale**





**Figure 13** Aerial Image – Hughesdale



## 4.2 Transformative Concepts

A review of the points of consideration and subsequent recommendations to the transformative concepts are shown in Table 9 below.

**Table 9**     **Hughesdale**

	<i>Points for consideration</i>	<i>Recommendation</i>
Create a new public space in William Street by linking Boyd Park with Poath and relocating car parking	It is noted that a number of land uses take access from William Street making it difficult to create a new public space.	
Extend Boyd Park and create a link to the railway station to provide a recreational space and improve connectivity of the area	It is considered there is scope to extend Boyd Park to the south connecting to public space adjacent to the rail line, which in turn would provide a pedestrian and cyclist connection through to Poath Road.	It is recommended to extend Boyd Park south to Railway Parade to connect the shared path.



## 5 BENTLEIGH

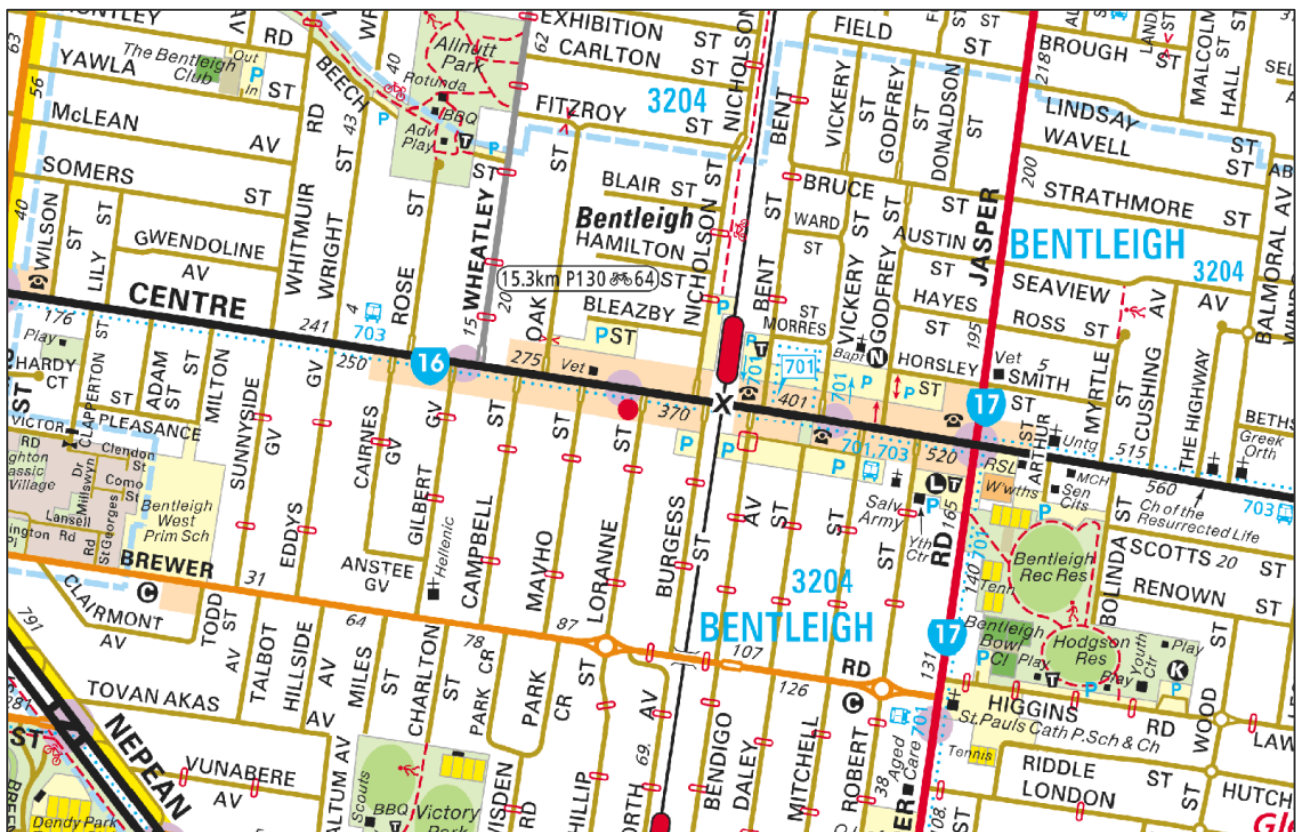
### 5.1 Existing Conditions

#### 5.1.1 Site Location

The subject area is located near and around Bentleigh Railway Station, as shown in Figure 14.

Land use in the immediate vicinity of the site is mixed in nature, and includes commercial uses and supermarkets along Centre Road, residential uses to the north and south of Centre Road and public use areas such as car parks and the Bentleigh Reserve.

**Figure 14 Site Location – Bentleigh**



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## 5.1.2 Council Car Parks

There are 6 large Council car parks located in the precinct as shown Figure 15. Car parks 1, 2, 4 and 5 have between 140 and 170 spaces whilst car park 3 has 56 spaces and car park 6 has 83 spaces. All the Council owned car parks have multi access points from at least two different roads.

Further investigation is required to determine whether the car park to the rear of the Aldi supermarket (car park 1) is Council owned or partially or fully privately owned.

In addition to the large Council owned car parks, there are several smaller Council car parks located south of Centre Road which contain between 28 and 60 car parking spaces.

**Figure 15 Council Car Parks – Bentleigh**

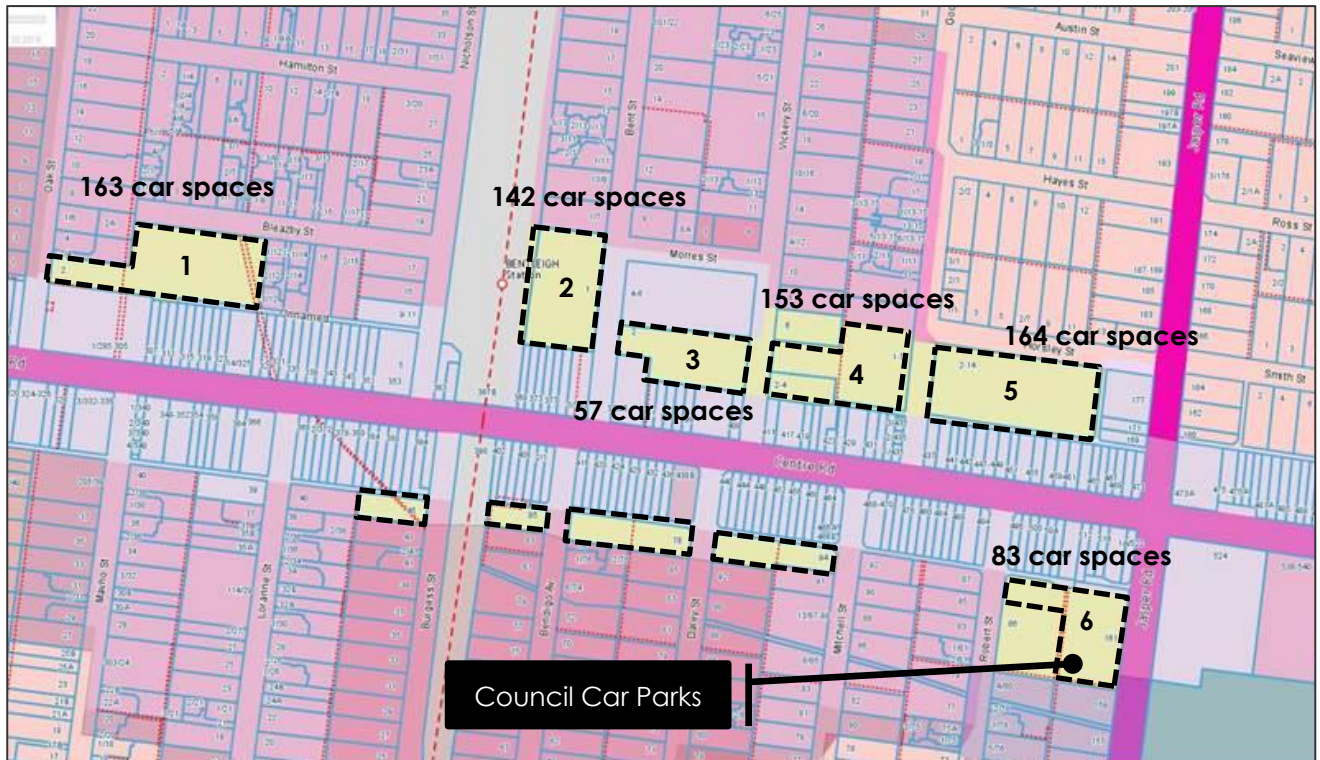




Figure 16 Aerial Image – Bentleigh



### 5.1.3 Existing Traffic Conditions

In order to ascertain recent and accurate traffic data, **onemilegrid** commissioned Trans Traffic Surveys to conduct traffic movement counts at the following intersections:

- Centre Road / Gilbert Grove;
- Centre Road / Campbell Street;
- Centre Road / Mavho Street;
- Centre Road / Lorraine Street;
- Centre Road / Burgess Street;
- Centre Road / Mitchell Street;
- Centre Road / Robert Street;
- Centre Road / Bent Street;
- Centre Road / Vickery Street; and
- Centre Road / Godfrey Street.

The turning movement counts were undertaken and recorded in 15 minute blocks on the following days and times:

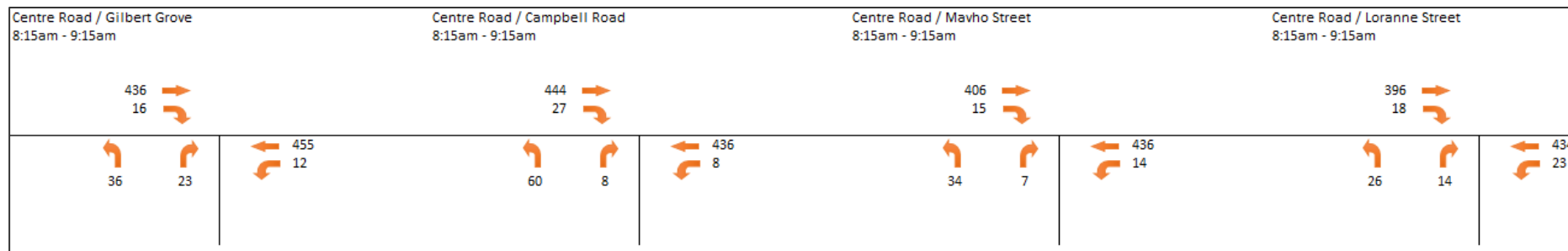
**Table 10 Turning Movement Survey Times – Carnegie**

<i>Day</i>	<i>Date</i>	<i>Time 1</i>	<i>Time 2</i>	<i>Interval</i>
Tuesday	07/02/2017	7:00am – 10:00am	4:00pm – 7:00pm	15 minutes

A summary of the AM peak hour and PM peak hour counts for the major intersections surrounding the subject area is shown in Figure 17 to Figure 22. It should be noted that each intersection does not necessarily have the same AM or PM peak hour.



**Figure 17 Bentleigh Existing Traffic Volumes – AM Peak Hour**



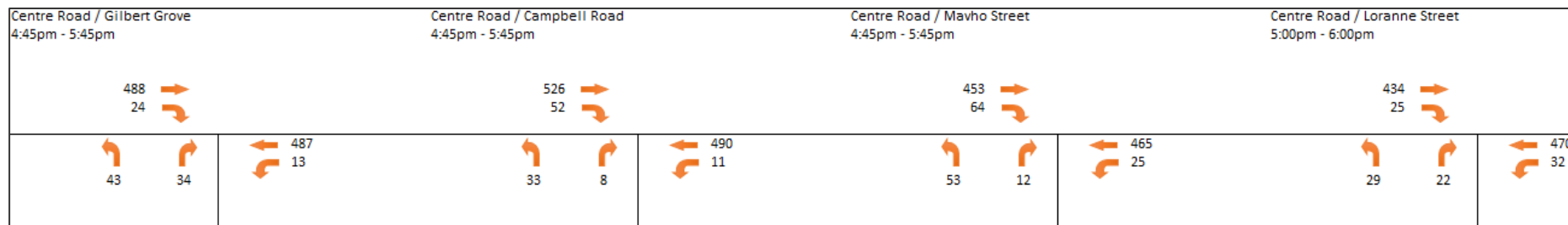
**Figure 18 Bentleigh Existing Traffic Volumes – AM Peak Hour**



**Figure 19 Bentleigh Existing Traffic Volumes – AM Peak Hour**



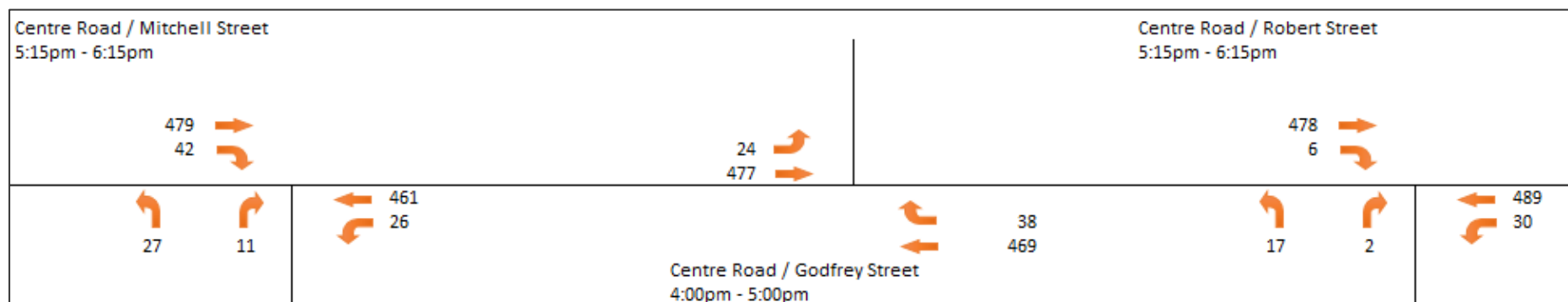
**Figure 20 Bentleigh Existing Traffic Volumes – PM Peak Hour**



**Figure 21 Bentleigh Existing Traffic Volumes – PM Peak Hour**



**Figure 22 Bentleigh Existing Traffic Volumes – PM Peak Hour**



To assess the operation of the intersection the traffic volumes have been input into SIDRA Intersection, a traffic modelling software package.

The results of the existing conditions analysis for Bentleigh is provided in Appendix C.

The results show that all intersections analysed are currently operating under 'excellent' conditions during both the morning and afternoon peak hours with minimal queues and delays experienced by motorists.

## 5.2 Transformative Concepts

### 5.2.1 Bentleigh Plaza

Council is considering extending Bentleigh Plaza and repurposing car park to create a more usable and inviting community town square through several different potential options.

A review of the points of consideration and subsequent recommendations to the transformative concepts are shown in Table 11 below.

**Table 11 Bentleigh Plaza**

	<i>Points for consideration</i>	<i>Recommendation</i>
Extend the plaza over Centre Road by full closure of Vickery Street	<p>There are various other access routes to the car parking areas either side of Vickery Street, such as the Bent Street accesses and the Godfrey Street access, as well as access from Horsley Street and Jasper Road.</p> <p>Review of existing traffic volumes and intersection operating conditions suggests that these alternative access points could readily accommodate traffic volumes currently catered for by the Vickery Street / Centre Road intersection.</p> <p>It is suggested that expanding the plaza over Centre Road to encompass the commercial frontage of Vickery Street could be readily accommodated from a traffic engineering perspective, and would improve pedestrian amenity and connectivity in the area, particularly when combined with the relocation of the signalised pedestrian crossing to better suit pedestrian desire lines. It would also improve the pedestrian access to bus services along Centre Road.</p>	It is considered that each of these components would be beneficial and are readily achievable.
Relocate pedestrian crossing to align with plaza, with kerb extensions and raised pedestrian platform	<p>It is considered that relocating the pedestrian crossing, particularly if the plaza extension is to be implemented, will better align the crossing to pedestrian desire lines.</p> <p>It is suggested that if the plaza extension is not implemented, there would still be some value (although not as much) in relocating the pedestrian crossing to align with the existing plaza, however in this case the crossing would need to be located towards the western end of the plaza to provide some separation from the Centre Road / Vickery Street intersection.</p>	
Reconfigure and extend car park to the north to address road closure of Vickery Street	<p>If the plaza extension were to be implemented, then the car parking area to the north could be reconfigured, with a consolidated car park layout likely to yield a greater number of spaces than the current arrangement, which is split by Vickery Street.</p>	



## 5.2.2 Council Car Park Development

Council is considering to repurposing the six large Council owned car parks either side of Centre Road to create several different alternative uses.

A review of the points of consideration and subsequent recommendations to the transformative concepts are shown in Table 12 below.

**Table 12 Bentleigh – Council Car Park Development**

	<i>Points for consideration</i>	<i>Recommendation</i>
Develop the six large Council owned car parks either side of Centre Road to create more public car parking within one centralised car parking structure	<p>In order to facilitate one centralised car parking structure, a multi deck car park would have to be constructed.</p> <p>It is noted that there are several smaller Council owned car parks on the south side of Centre Road, behind the commercial shops that front Centre Road.</p> <p>If Vickery Road were to be closed, it would be possible to combine car parks 3 &amp; 4 (see Section 5.1.2).</p> <p>The western car park (car park 1) services a different section of activity centre than the other car parks.</p> <p>The eastern car park north of the Centre Road (car park 5) is the only car park that does not directly abut residential properties and is a preferable option for a multi deck car park.</p>	<p>It is suggested to combine car parks 3 &amp; 4 to create a multi deck car if Vickery Road were to be fully closed. These car parks are the most centrally located and could cater for the greatest number of car spaces per level, potentially resulting in fewer levels.</p> <p>Another option is to utilise car park 5 to create a multi deck car park as it is separated from residential properties by Horsley Road.</p>

Develop the six large Council owned car parks either side of Centre Road to create a new centralised community hub building with library and other uses

This new facility would generate an additional parking demand in the area which would have to be met elsewhere.

Car parking demands for a library and potential other uses can be determined once floor areas are finalised.

Community hub or library could be design to incorporate car parking within the built form of the structure to improve the amenity in the precinct.

The car park adjacent to the railway station on the east side (car park 2) is preferable option for a community hub building as it has direct access to multiple public transport options and car parking is well serviced on the east side of the railway station.

The car park adjacent to the railway station on the east side (car park 2) could be utilised to construct a community hub building including a library. The location in respects to public transport coupled with the alternative car parking options on the east side of the railway line make it the preferred location in terms of accessibility.

The western car park (car park 1) should be retained to ensure parking is available on both sides of the railway line to cater for mobility impaired users of the precinct.

### 5.2.3 Pedestrianise Laneway & Streets

It is proposed to create a pedestrian friendly street and laneway network by exploring a variety of options that involve alterations to the surround road network.

A review of the points of consideration and subsequent recommendations to the transformative concepts are shown in Table 13 below.

**Table 13 Pedestrian Friendly Street & Laneway Network**

	<i>Points for consideration</i>	<i>Recommendation</i>
Formal vehicular connection linking Morres Street and Horsley Street	The provision of a formal link between Morres Street and Horsley Street would either require the acquisition of property between Vickery Street and Godfrey Street, or the reconfiguration of the existing car park which would result in a loss of parking.	Considering the existing traffic volumes in the area and the operations of existing intersections (which are well within their respective capacities) it is not considered necessary to provide a formal vehicle link between Morres Street and Horsley Street.
Full closure of the commercial length of Campbell Street	<p>The existing land use at the southwest corner of the Centre Road / Campbell Street intersection currently takes vehicle access from Campbell Street, which would need to be retained. It also appears that waste collection for this use occurs from the northern end of Campbell Street.</p> <p>If the road is to be closed completely, a turnaround area would need to be provided to the south of the closure. The turnaround area would typically be designed to accommodate vehicles up to an 8.8 m service vehicle. Alternatively, a connection through to either Gilbert Grove or Mavho Street would need to be provided.</p>	It is considered unfeasible to close the northern portion of these streets due to the requirement to provide either a turnaround area or a through connection to an adjacent street. It is considered that closing these streets to northbound traffic is not a feasible option for the same reason.
Extend Campbell Street footpath at the commercial frontage and provide one-way treatment (retain northbound traffic)	There would be scope to provide a one-way northbound arrangement at the northern end of Campbell Street, and widen the footpath on either side of the road.	It is suggested that each street could be converted to a one-way northbound operation in isolation, however if a treatment is to be installed on all three streets then it is suggested that a combination of Shared Zones and one-way

northbound configurations should be implemented to maintain a reasonable level of connectivity for local access.

Extend Campbell Street footpath at the commercial frontage and provide one-way treatment (retain southbound traffic)	If a one-way southbound arrangement were to be provided on Campbell Street, a turnaround area or through connection to either Gilbert Grove or Mavho Street would need to be provided.
Convert the commercial frontage of Campbell Street to a Shared Zone	It is considered that there is scope to convert the northern end of Campbell Street to a Shared Zone. This would provide a pedestrian friendly environment with pedestrian priority while maintaining vehicular connectivity.
Full closure of the commercial length of Mavho Street	<p>If the road is to be closed completely, a turnaround area would need to be provided to the south of the closure. The turnaround area would typically be designed to accommodate vehicles up to an 8.8 m service vehicle. Alternatively, a connection through to either Campbell Street or Loranne Street would need to be provided.</p> <p>There are no land uses that currently take access from this portion of Mavho Street, however it appears as though bins for some uses are collected from this area. It is considered that this could be managed through measures such as removable bollards to allow waste collection vehicle access.</p>
Extend Mavho Street footpath at the commercial frontage and provide one-way treatment (retain northbound traffic)	There would be scope to provide a one-way northbound arrangement at the northern end of Mavho Street, and widen the footpath on either side of the road.
Extend Mavho Street footpath at the commercial frontage and provide one-way treatment (retain southbound traffic)	If a one-way southbound arrangement were to be provided on Mavho Street, a turnaround area or through connection to either Campbell Street or Loranne Street would need to be provided.



Convert the commercial frontage of Loranne Street to a Shared Zone	It is considered that there is scope to convert the northern end of Mavho Street to a Shared Zone. This would provide a pedestrian friendly environment with pedestrian priority while maintaining vehicular connectivity.
Full closure of the commercial length of Loranne Street	<p>If the road is to be closed completely, a turnaround area would need to be provided to the south of the closure. The turnaround area would typically be designed to accommodate vehicles up to an 8.8 m service vehicle. Alternatively, a connection through to either Mavho Street or Burgess Street would need to be provided.</p> <p>Waste collection arrangements for adjacent uses would need to be considered and managed appropriately.</p>
Extend Loranne Street footpath at the commercial frontage and provide one-way treatment (retain northbound traffic)	There would be scope to provide a one-way northbound arrangement at the northern end of Loranne Street, and widen the footpath on either side of the road.
Extend Loranne Street footpath at the commercial frontage and provide one-way treatment (retain southbound traffic)	If a one-way southbound arrangement were to be provided on Loranne Street, a turnaround area or through connection to either Mavho Street or Burgess Street would need to be provided.
Convert the commercial frontage of Loranne Street to a Shared Zone	It is considered that there is scope to convert the northern end of Loranne Street to a Shared Zone. This would provide a pedestrian friendly environment with pedestrian priority while maintaining vehicular connectivity.

## 6 ELSTERNWICK

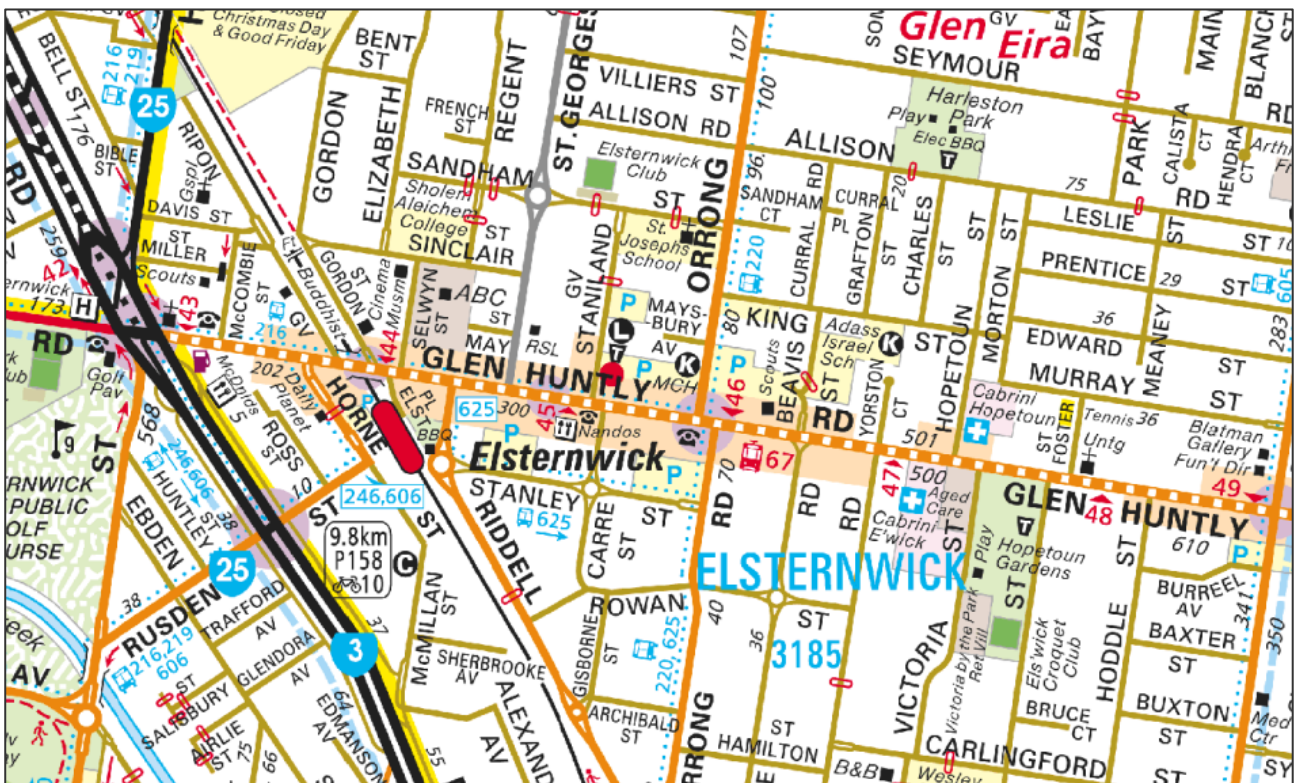
### 6.1 Elsternwick

#### 6.1.1 Site Location

The subject area is located near and around Elsternwick Railway Station, as shown in Figure 23.

Land use in the immediate vicinity of the site is mixed in nature, and includes commercial shops along Glen Huntly Road, residential uses to the north of south of the Glen Huntly Road commercial strip and Council owned car parks either side of Glen Huntly Road, east of Elsternwick Railway Station.

**Figure 23 Site Location – Elsternwick**



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## 6.1.2 Council Car Parks

There are 4 Council car parks located in the precinct as shown Figure 24. The south western and south eastern car parks are accessed via Stanley Street and contain 78 and 126 car parking spaces respectively. Of the car parks located north of Glen Huntly Road, the south car park is access via Staniland Grove and Orrong Road and the north car park is accessed from Staniland Grove. The south car park contains 72 spaces and the north car park contains 88 car parking spaces.

**Figure 24 Council Car Parks – Elsternwick**

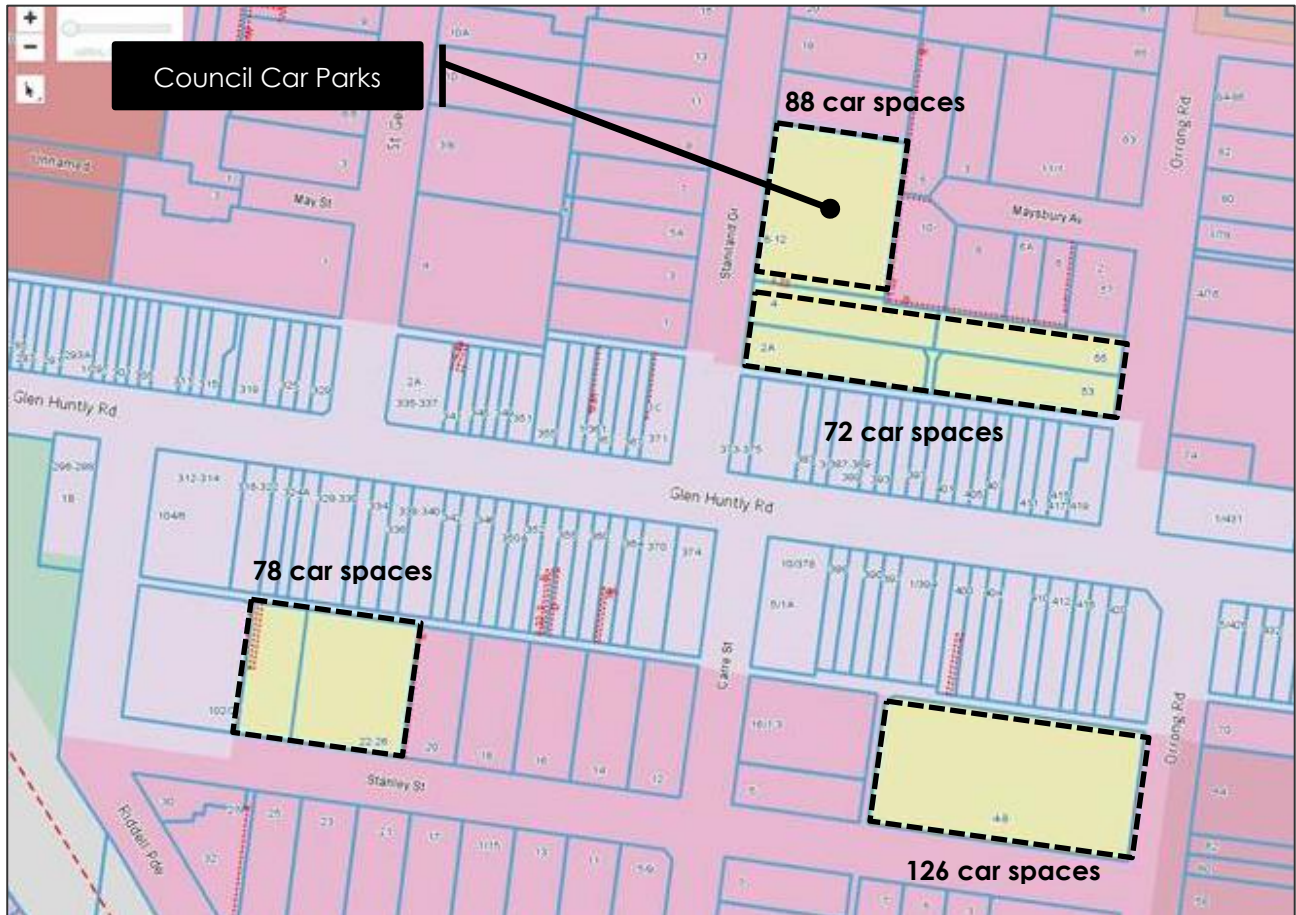




Figure 25 Aerial Image – Elsternwick





### 6.1.3 Existing Traffic Conditions

In order to ascertain recent and accurate traffic data, **onemilegrid** commissioned Trans Traffic Surveys to conduct traffic movement counts at the following intersections:

- Glen Huntly Road / Ripon Grove;
- Glen Huntly Road / Gordon Street;
- Glen Huntly Road / Selwyn Street;
- Glen Huntly Road / Riddell Parade;
- Glen Huntly Road / St. Georges Road;
- Glen Huntly Road / Staniland Grove;
- Glen Huntly Road / Carre Street;
- Glen Huntly Road / Orrong Road;
- Glen Huntly Road / Beavis Street; and
- Glen Huntly Road / Hopetoun Street.

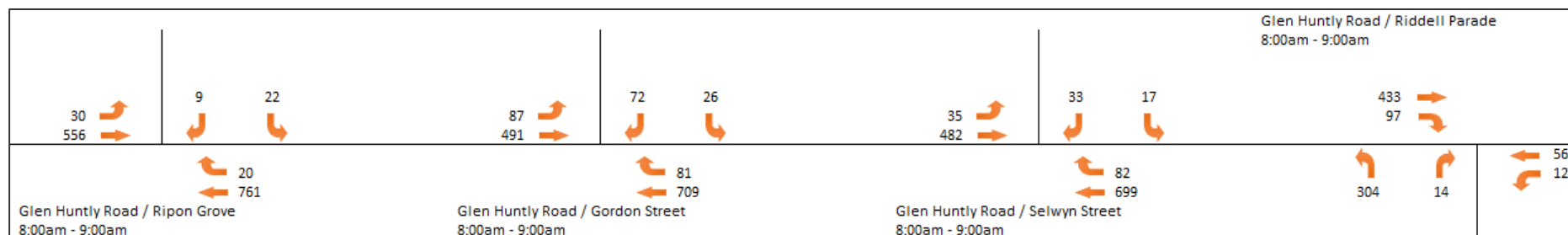
The turning movement counts were undertaken and recorded in 15 minute blocks on the following days and times:

**Table 14 Turning Movement Survey Times – Carnegie**

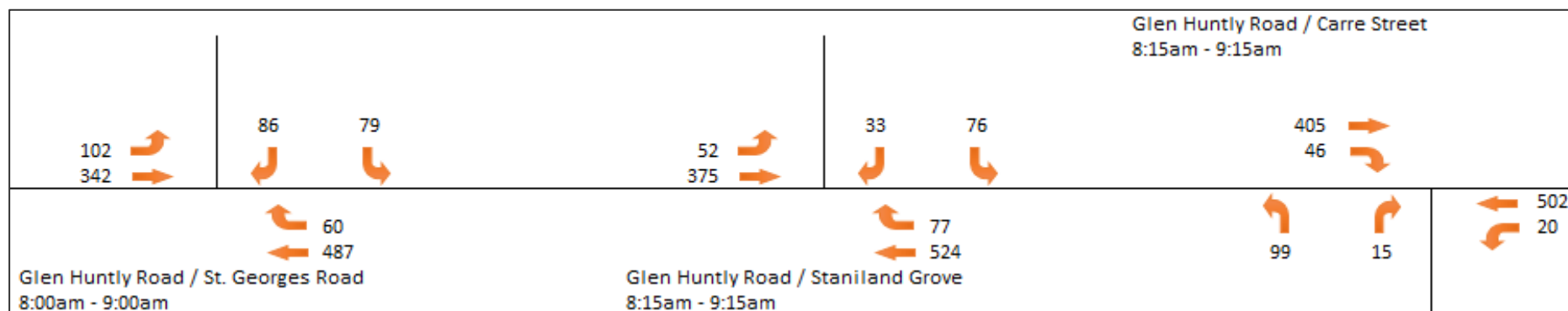
<i>Day</i>	<i>Date</i>	<i>Time 1</i>	<i>Time 2</i>	<i>Interval</i>
Tuesday	07/02/2017	7:00am – 10:00am	4:00pm – 7:00pm	15 minutes

A summary of the AM peak hour and PM peak hour counts for the major intersections surrounding the subject area is shown in Figure 26 to Figure 31. It should be noted that each intersection does not necessarily have the same AM or PM peak hour.

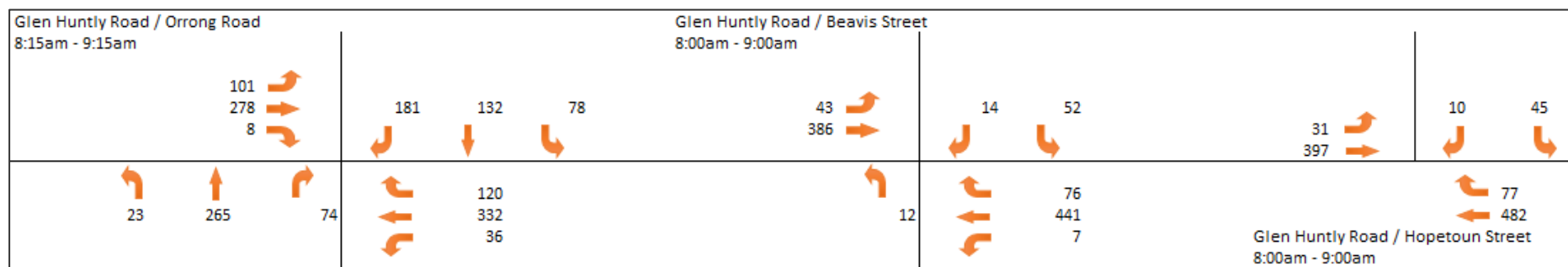
**Figure 26 Elsternwick Existing Traffic Volumes – AM Peak Hour**



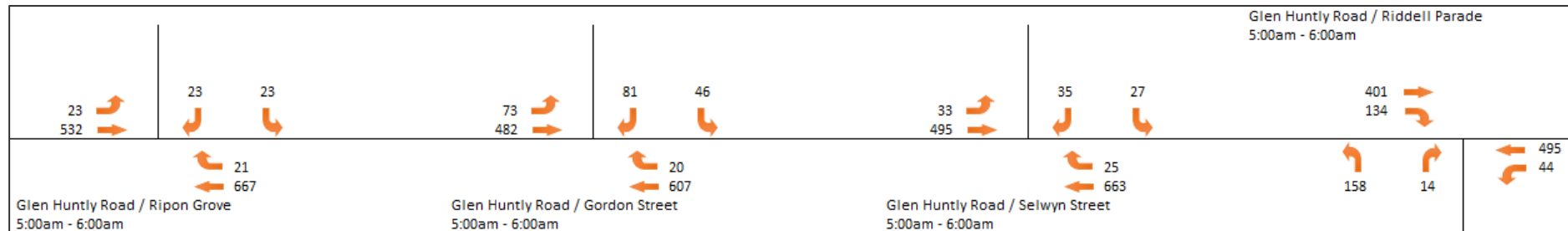
**Figure 27 Elsternwick Existing Traffic Volumes – AM Peak Hour**



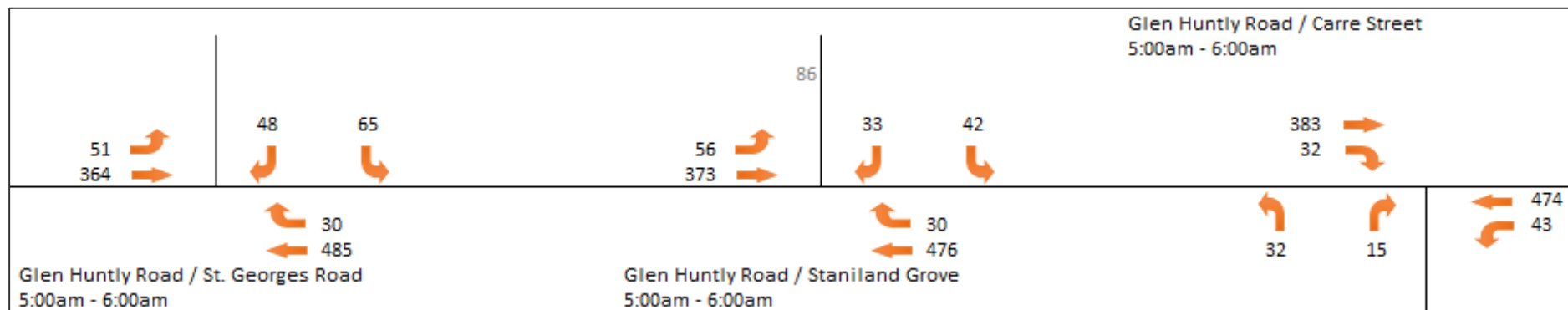
**Figure 28 Elsternwick Existing Traffic Volumes – AM Peak Hour**



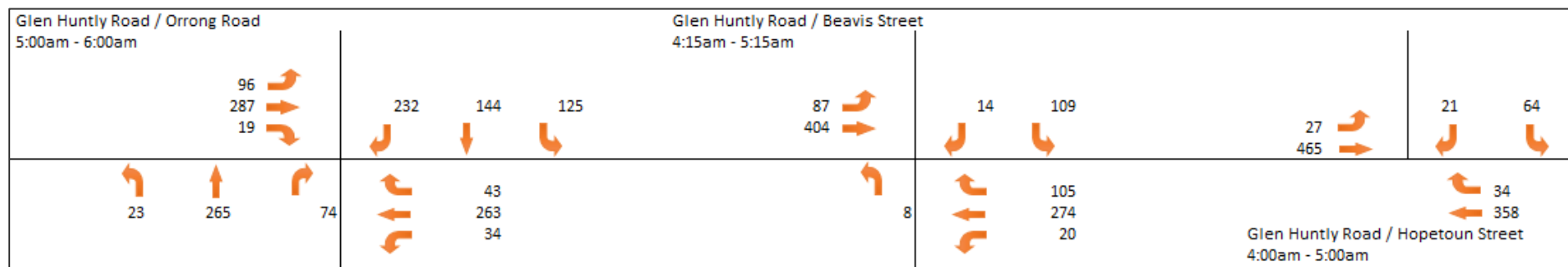
**Figure 29 Elsternwick Existing Traffic Volumes – PM Peak Hour**



**Figure 30 Elsternwick Existing Traffic Volumes – PM Peak Hour**



**Figure 31 Elsternwick Existing Traffic Volumes – PM Peak Hour**



To assess the operation of the intersection the traffic volumes have been input into SIDRA Intersection, a traffic modelling software package.

The results of the existing conditions analysis for Elsternwick is provided in Appendix D.

The results show that most intersections analysed are currently operating under 'excellent' conditions during both the morning and afternoon peak hours with minimal queues and delays experienced by motorists. The intersection of Glen Huntly Road and Orrong Road operates under 'fair' conditions in the morning peak hour and under 'good' conditions in the afternoon peak hour.



## 6.2 Transformative Concepts

### 6.2.1 Development of Council Owned Car Parks

Council is considering various options to repurpose the Council owned car parks in the precinct to create a new centralised public car park. A review of the points of consideration and subsequent recommendations to the transformative concepts are shown in Table 15 below.

**Table 15 Development of Council Owned Car Parks**

	<i>Points for consideration</i>	<i>Recommendation</i>
Develop the Council owned car parks to create a new centralised community hub building with library and other uses	If the existing library is to be retained, the northern car park could be developed to create the community hub. The community hub could be incorporated into the built form of a multipurpose facility which includes car parking and other uses.	The use of any of the three mentioned Council owned car parks could be utilised for a centralised community hub and/or multipurpose car parking structure depending on the preference of Council and the community.
More public car parking within one centralised car parking structure, with: <ul style="list-style-type: none"> <li>➤ Ground floor leasable tenancy; and</li> <li>➤ Rooftop public multi-purpose recreational facility.</li> </ul>	<p>Car parking should be provided to accommodate the spaces lost due to the closure of the other Council car park as well as the demand generated by the new uses, which can be determined once floor areas are finalised.</p> <p>The northern car park could be utilised for the multipurpose facility as it could incorporate the existing library into the overall facility. If the northern car park were used for a centralised car parking structure, the potential closure of the commercial portion of Staniland Grove would not be advised as access to the car park would be forced to be from the neighbouring residential street or through the adjacent southern car park instead of from Glen Huntly Road which would be preferred.</p> <p>The southeast car park is a viable option for the multipurpose facility as it provides access from Orrong Road which serves more as a collector road than a local access street, and has the largest foot print which potentially allows for fewer levels to meet the car parking demands. The laneway access to rear of commercial tenancies would have to be retained if this car park was developed.</p> <p>The southwest car park is also a viable option for the multipurpose facility as it well located in regard to public transport accessibility, being within close walking distance to train, tram and bus services. However, laneway access to adjacent commercial properties would need to be maintained and the site has direct frontage to a residential property.</p>	Formal pedestrian links from Glen Huntly Road to the multipurpose structure should be created.

Appropriate pedestrian laneway connections from Glen Huntly Road to these new facilities	<p>None of the car parks currently have formal pedestrian access from Glen Huntly Road, however convenient access is provided via side streets.</p> <p>It is likely that property acquisition would be required to create a direct pedestrian connection, particularly to the southwest car park.</p>
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A review of the points of consideration and subsequent recommendations to the options regarding Carre Street and Staniland Grove are shown in Table 16 below.

**Table 16 Carre Street and Staniland Grove**

	<i>Points for consideration</i>	<i>Recommendation</i>
Close the commercial length of Carre Street to create a new green plaza space with canopy trees	<p>There is scope to close the commercial length of Carre Street, and consideration to closing it beyond the commercial frontage up to Stanley Street should also be given. A connection between the laneways that run behind the commercial uses either side of Carre Street would need to be provided.</p> <p>If only the commercial frontage is to be closed (i.e. not the section between Stanley Street and the rear access laneway) then the section between the laneway and Stanley Street should be downgraded, to serve as property access only.</p>	<p>It is considered that there would be benefit in closing Carre Street to vehicle traffic between Glen Huntly Road and Stanley Street to create a green plaza.</p> <p>The closure of Staniland Street would be dependent on whether it is possible to accommodate an appropriate turnaround area or through connection to Orrong Road.</p>
Close the commercial length of Staniland Street to create a new green plaza space with canopy trees	<p>If the commercial length of Staniland Grove were to be closed, the car park between Staniland Grove and Orrong Road would need to serve as a thoroughfare. Alternatively, a turnaround area would need to be provided to the north of the closure. The turnaround area would typically be designed to accommodate vehicles up to 8.8 m service vehicles.</p>	

## 6.2.2 Entertainment Precinct

Investigation into the creation of a cultural and entertainment precinct is being conducted through the consideration of a variety of options. A review of the points of consideration and subsequent recommendations to the transformative concepts are shown in Table 17 below.

**Table 17 Entertainment Precinct**

	<i>Points for consideration</i>	<i>Recommendation</i>
Close Gordon Street along the length of the commercial frontage and create a new road link across the railway line	<p>If the commercial frontage of Gordon Street were to be closed, then a turnaround area would need to be provided to the north.</p> <p>Vehicle connectivity to the angled car parking on the western side of Gordon Street would be affected.</p> <p>The provision of a road link over the rail would improve connectivity but may promote rat-running, particularly during the PM peak period.</p>	<p>It is considered that Ripon Grove could readily be converted to a one-way operation.</p> <p>It would be difficult to close the commercial frontage of Gordon Street due to the requirement to provide a turnaround area. It is suggested that a one-way northbound operation could be implemented on Gordon Street, with a widened footpath to improve pedestrian amenity. A one-way southbound operation could then be implemented on Selwyn Street.</p>
Make Ripon Grove one-way and extend eastern footpath	<p>It is considered that Ripon Grove could be converted to either a northbound only or southbound only operation between Glen Huntly Road and Davis Street.</p> <p>The angled parking provisions on the eastern side of the road may need to be reconfigured to suit the direction of travel and / or the extended footpath.</p>	<p>It is understood that a supermarket is contemplated at the southeast corner of the Selwyn Street. Sinclair Street intersection. If this is the case then it would be beneficial to maintain a two-way operation on Selwyn Street, to allow supermarket traffic to access the site directly via Selwyn Street and Glen Huntly Road.</p>
Make Selwyn Street one-way and extend footpath on eastern side	<p>There is scope to convert Selwyn Street to a one-way operation either northbound or southbound.</p> <p>Vehicle access to and from uses such as Sholem Aleichem College would need to be considered if these works were to be implemented in conjunction with the Gordon Street closure.</p>	

### 6.2.3 Pedestrianise Lane & Streets

Council is considering to create a pedestrian friendly street and laneway network by exploring a variety of options that involve alterations to the commercial lengths of Beavis Street and Downshire Road.

A review of the points of consideration and subsequent recommendations to the transformative concepts are shown in Table 18 and Table 19 below.

**Table 18 Beavis Street**

	<i>Points for consideration</i>	<i>Recommendation</i>
Full closure of commercial length of Beavis Street	<p>A number of properties take their vehicle access from this section of Beavis Street. These access points would need to be maintained.</p> <p>Waste collection arrangements for buildings fronting this section of street would need to be confirmed, and appropriate arrangements would need to be made.</p> <p>A turnaround around area would need to be provided at the end of Beavis Street or the car park would be required to become a thoroughfare which is not an ideal arrangement.</p>	<p>It is suggested that a one-way configuration (maintain southbound traffic operation) would be the most suitable arrangement for this location. This could be combined with a shared zone to further improve amenity.</p> <p>There are a number of properties to which access needs to be maintained, which could be achieved under the one-way arrangement.</p>
One-way with extended footpath on southern side (maintain northbound traffic operation)	<p>Vehicles exiting the Coles supermarket car park would likely do so onto Orrong Road.</p> <p>Turnaround area or through connection would be required at the end of Beavis Street.</p>	
One-way with extended footpath on southern side (maintain southbound traffic operation)	<p>This arrangement would allow for car park egress and no turnaround area would be required.</p> <p>This arrangement help maintain local connectivity.</p>	
Shared space two-way	<p>Shared Zone would provide pedestrian priority within a low speed environment (speed limit of 10 km/h) while maintaining current level of accessibility for land uses in the area.</p>	



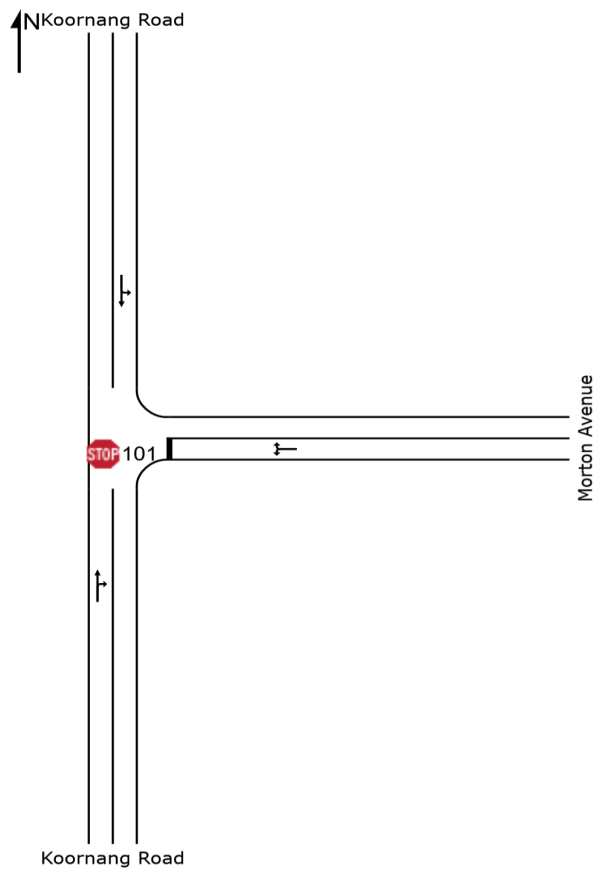
**Table 19 Downshire Road**

	<i>Points for consideration</i>	<i>Recommendation</i>
Full closure of commercial length of Downshire Road	<p>Downshire Road currently operates as a left in left out arrangement at the intersection with Glen Huntly Road.</p> <p>A number of properties take their vehicle loading access from this section of Downshire Road. This access point would need to be maintained.</p> <p>Waste collection arrangements for buildings fronting this section of street would need to be confirmed, and appropriate arrangements would need to be made.</p> <p>A turnaround around area would need to be provided at the end of Downshire Road.</p>	<p>It is suggested that a one-way northbound Shared Zone would be the most suitable arrangement for this location.</p> <p>There are a number of properties to which access needs to be maintained, which could be achieved under the one-way Shared Zone arrangement. This would create a low volume, low speed environment to improve pedestrian amenity.</p>
One-way with extended footpath on southern side (maintain northbound traffic operation)	<p>Low traffic numbers into Downshire Road from Glen Huntly Road indicate that traffic could easily be distributed to other local roads without much tangible effect.</p>	
One-way with extended footpath on southern side (maintain southbound traffic operation)	<p>Low traffic numbers from Downshire Road from Glen Huntly Road indicate that traffic could easily be distributed to other local roads without much tangible effect.</p> <p>A turnaround area would be required under this arrangement.</p>	
Shared space two-way	<p>Shared Zone would provide pedestrian priority within a low speed environment (speed limit of 10 km/h) while maintaining current level of accessibility for land uses in the area.</p>	

## ***Appendix A    SIDRA Intersection Results – Carnegie***

Koornang Road / Morton Avenue  
AM Peak Hour, Existing Geometry, Existing Conditions

Two-Way Stop



Koornang Road											

### Two-Way Stop

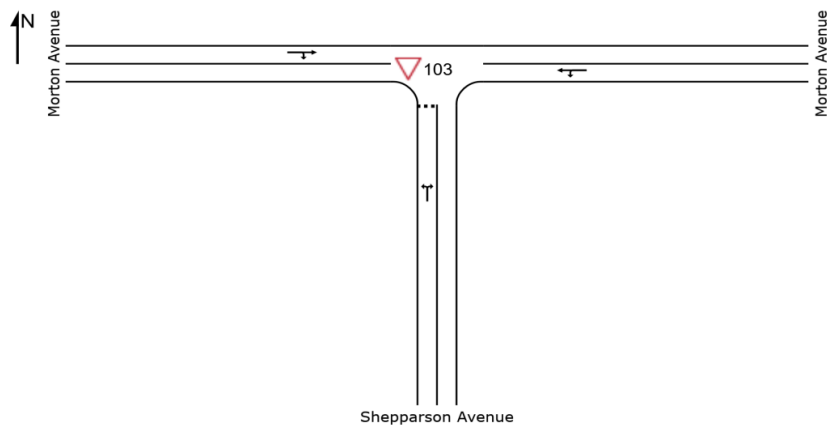


		Koornang Road						Morton Avenue			
		App	R	T	L			App	R	T	L
L T R App		0		0	0						
		0		0	0						
		0.32		0.32	0.32						
		615		541	74						
		12		11	1						
		603		530	73						
						39	1	40	0.09	2	6
						31	1	32	0.09	2	7
						8	0	8	0.09	2	3
	1059		408	11	417	LV*					
	22		8	0	9	HV*					
	1081		416	11	426	Total Vol*					
	0.32		0.23	0.23	0.23	D.o.S.					
	2		1	1	1	95th %ile Back of Queue (m)					
	0		0	4	0	Average Delay (sec)					
	Intersection	L	T	R	App						
		Koornang Road									

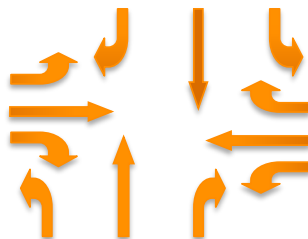
\*Output Volumes



### Give-Way/Yield

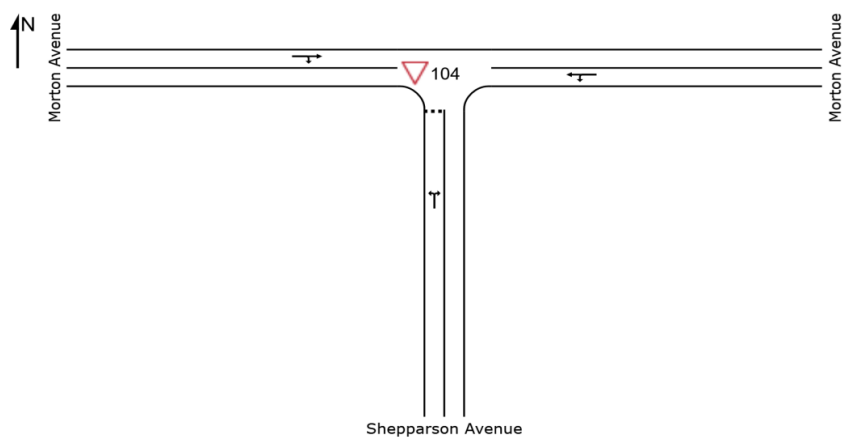


App	R	T	L
-----	---	---	---

Morton Avenue										Morton Avenue													
L	0	1	0.03	8	0	8					18	0	18	0.01	0	0	App						
T	0	1	0.03	45	1	44					12	0	12	0.01	0	0	R						
R	0	1	0.03	54	1	53					6	0	6	0.01	0	0	T						
App	0	1															L						
				111	36	4	40	LV*															
				2	1	0	1	HV*															
				113	37	4	41	Total Vol*															
				0.03	0.03	0.03	0.03	D.o.S.															
				1	1	1	1	95%ile Back of Queue (m)															
				0	0	0	0	Average Delay (sec)															
				Intersection	L	T	R	App															
														Shepparson Avenue									

\*Output Volumes

### Give-Way/Yield



**Morton Avenue**

0	0	<b>App</b>
		<b>R</b>
0	0	<b>T</b>
0	0	<b>L</b>

\*Output Volumes

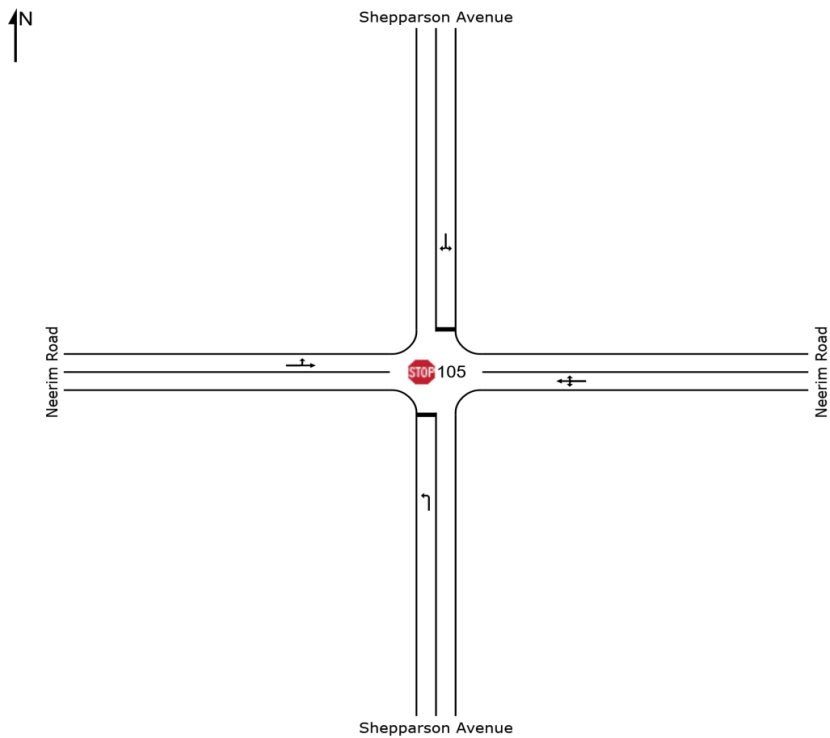
95th %ile Back of Queue (m)  
Average Delay (sec)

## Intersection

**Shepparson Avenue**

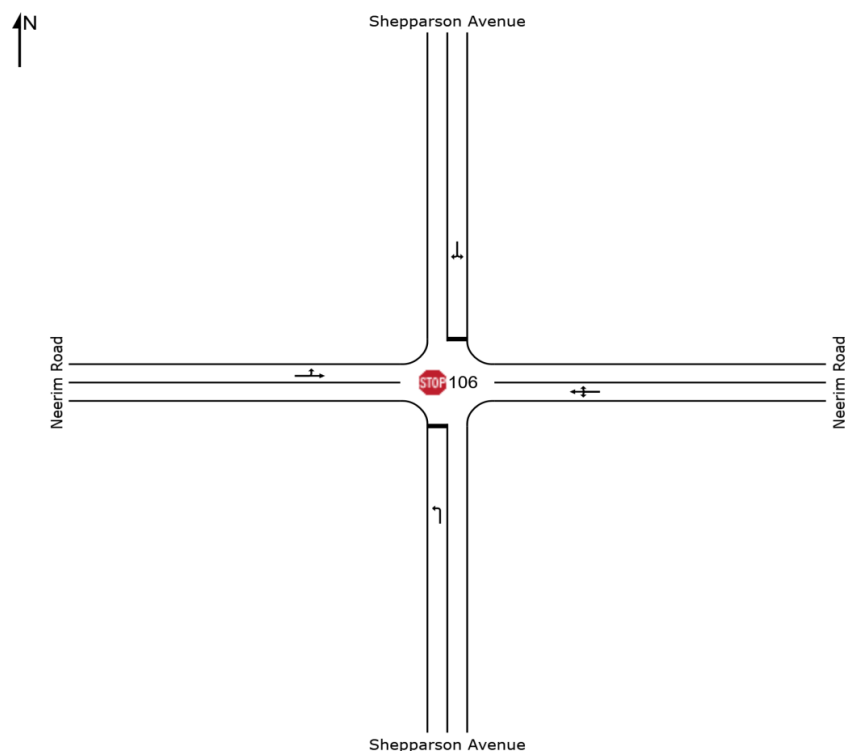
Neerim Road / Shepparson Avenue  
AM Peak Hour, Existing Conditions, Existing Counts

Two-Way Stop



Shepparson Avenue														

### Two-Way Stop

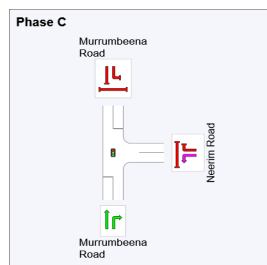
[illegible]



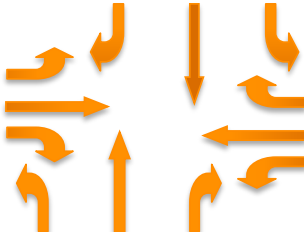
# ***Appendix B      SIDRA Intersection Results – Murrumbeena***



## Signals



Phase	Grn	Yel	Red	Total	%
A	15	4	2	21	23.33
B	9	4	2	15	16.67
C	48	4	2	54	60

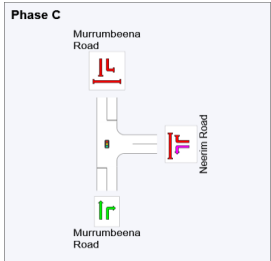
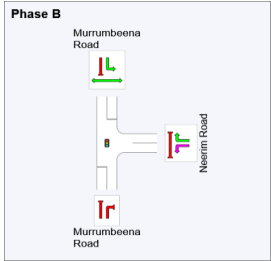
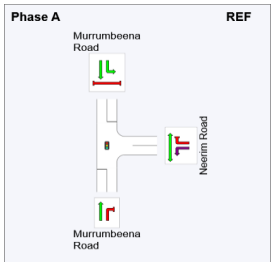
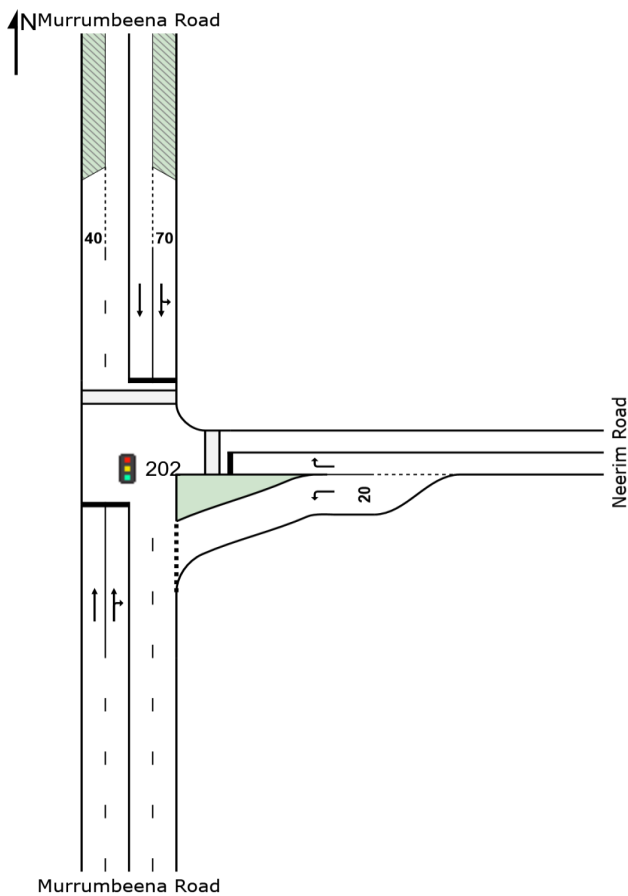
Murrumbeena Road										90	
App		R	T	L							
37			37	36							
39			39	39							
0.42			0.42	0.42							
273			260	13							
5			5	0							
268			255	13							
				234	5	239	0.44	25	15	App R T L	
				79	2	81	0.44	25	43		
				155	3	158	0.1	7	1		
1170			549	120	668	LV*					
24			11	2	14	HV*					
1194			560	122	682	Total Vol*					
0.44			0.44	0.44	0.44	D.o.S.					
84			84	84	84	95th %ile Back of Queue (m)					
16			8	10	8	Average Delay (sec)					
Intersection		L	T	R	App						
Murrumbeena Road											

Neerim Road

\*Output Volumes

Murrembeena Road / Neerim Road  
PM Peak Hour, Existing Geometry, Existing Conditions

Signals



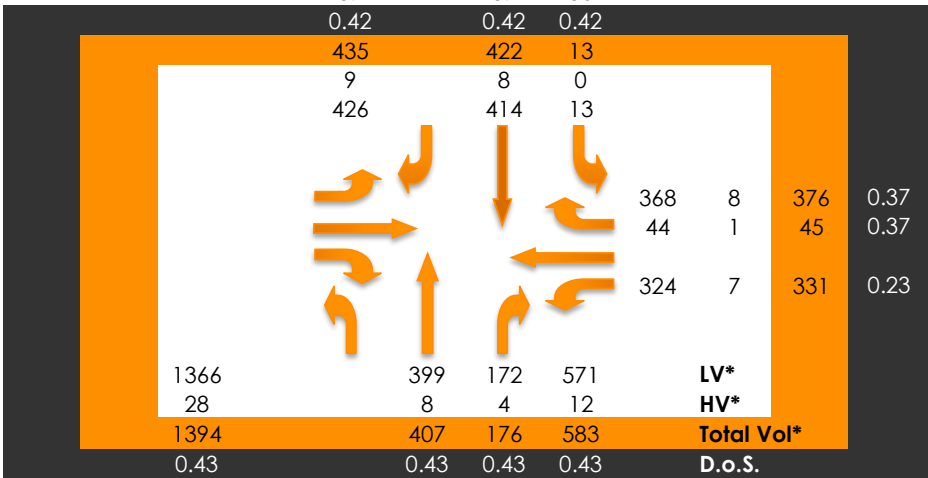
Phase	Grn	Yel	Red	Total	%
A	24	4	2	30	33.33
B	6	4	2	12	13.33
C	42	4	2	48	53.33



Murrembeena Road

App	R	T	L
29		29	29
57		57	56

90



Neerim Road

App	R	T	L
376	8	45	0.37
22	7	47	0.37
331	7	22	0.23
22	2		

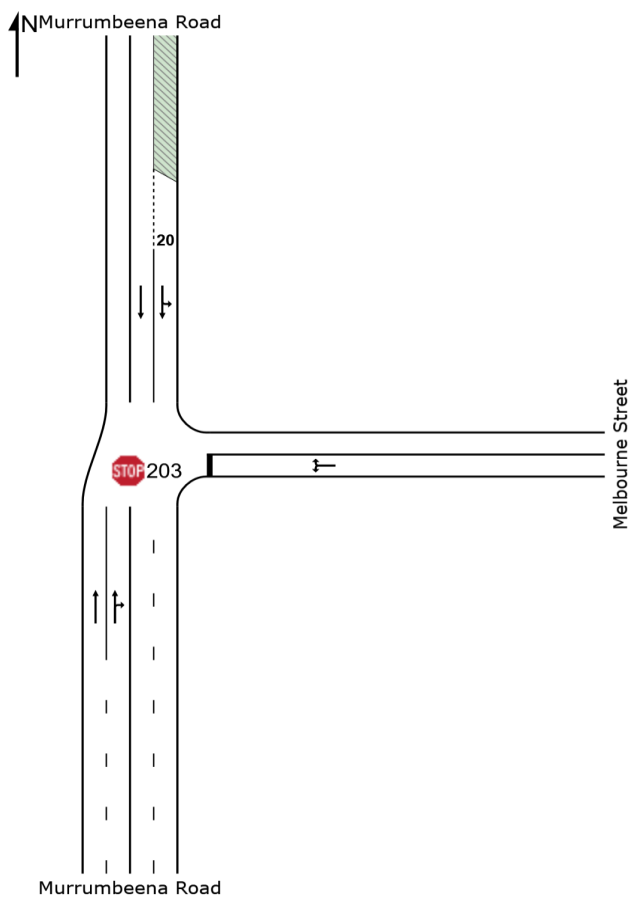
\*Output Volumes

Intersection	L	T	R	App
78	78	78	78	95th %ile Back of Queue (m)
16	9	15	11	Average Delay (sec)

Murrembeena Road

Murrumbeena Road / Melbourne Street  
AM Peak Hour, Existing Geometry, Existing Conditions

Two-Way Stop

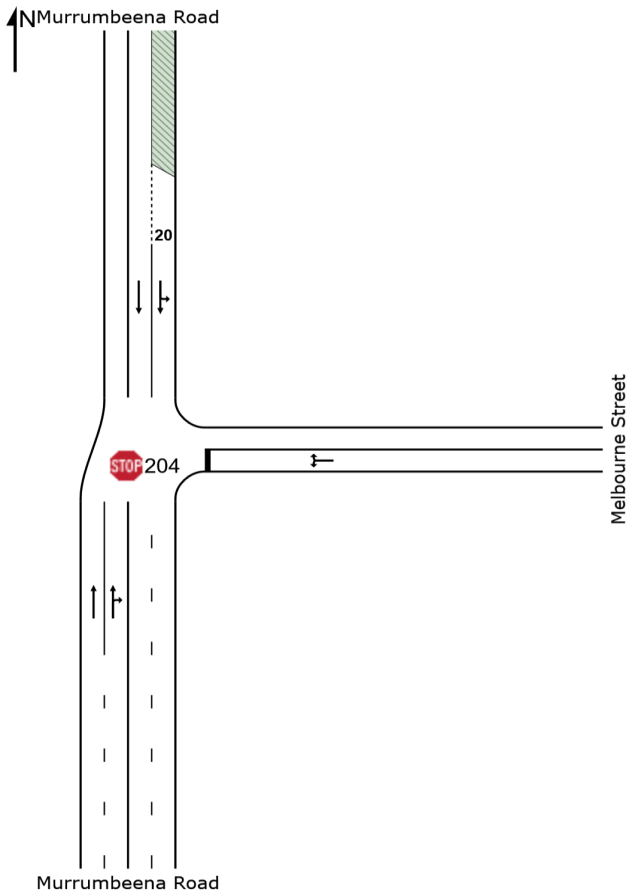


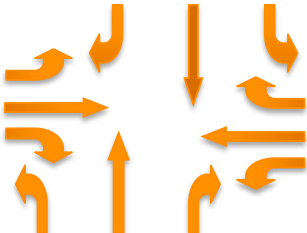
Murrumbeena Road												



Murrumbeena Road / Melbourne Street  
 PM Peak Hour, Existing Geometry, Existing Conditions

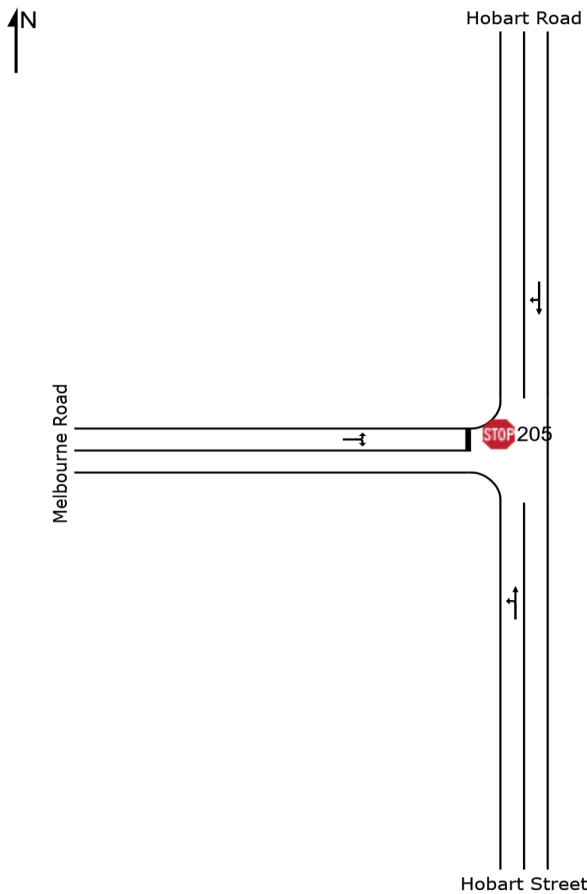
Two-Way Stop



Murrumbeena Road																	
				App	R	T	L										
				0		0	0										
				0		0	0										
				0.11		0.11	0.11										
				419		400	19										
				8		8	0										
				411		392	19										
																	
L T R App									43	1	44	0.08	2	4	App		
									16	0	16	0.08	2	10	R		
									27	1	28	0.08	2	1	T		
													L				
				909		446	11	456	LV*								
				19		9	0	9	HV*								
				928		455	11	465	Total Vol*								
				0.21		0.21	0.21	0.21	D.o.S.								
				2		1	1	1	95th %ile Back of Queue (m)								
				0		0	2	0	Average Delay (sec)								
Intersection				L	T	R	App										
Murrumbeena Road																	
				App	R	T	L										
				0		0	0										
				0		0	0										
				0.11		0.11	0.11										
				419		400	19										
				8		8	0										
				411		392	19										
L T R App									43	1	44	0.08	2	4	App		
									16	0	16	0.08	2	10	R		
									27	1	28	0.08	2	1	T		
													L				
				909		446	11	456	LV*								
				19		9	0	9	HV*								
				928		455	11	465	Total Vol*								
				0.21		0.21	0.21	0.21	D.o.S.								
				2		1	1	1	95th %ile Back of Queue (m)								
				0		0	2	0	Average Delay (sec)								
Intersection				L	T	R	App										
Melbourne Street																	
				App	R	T	L										
				2	4												
				2	10												
				2	1												

Hobart Street / Melbourne Street  
AM Peak Hour, Existing Geometry, Existing Conditions

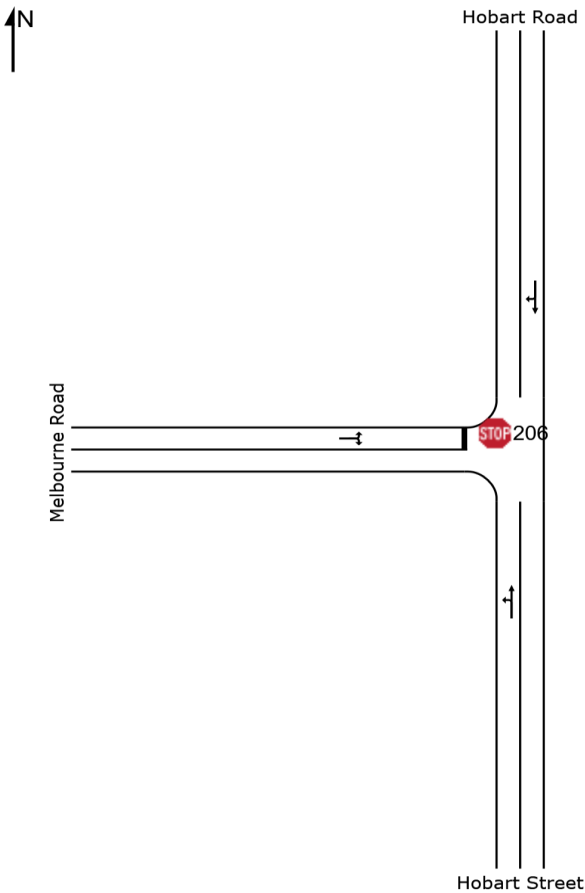
Two-Way Stop



		Hobart Road															
		App	R	T	L												
		0	0	0													
		1	1	1													
		0.09	0.09	0.09													
		168	19	149													
		3	0	3													
		165	19	146													

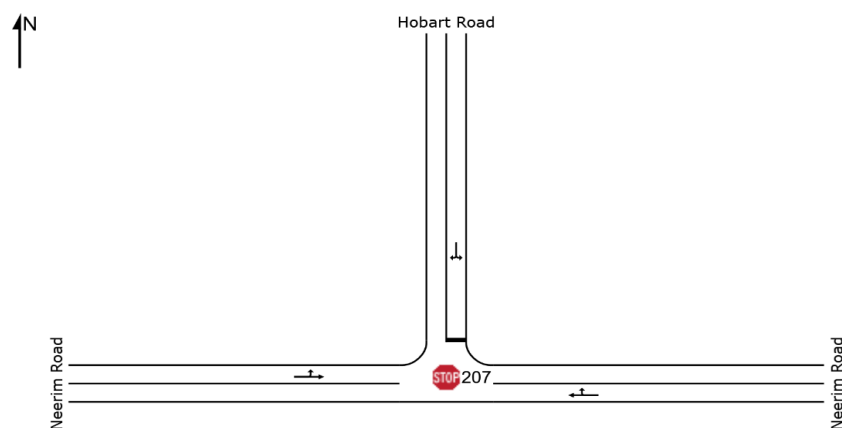
Hobart Street / Melbourne Street  
PM Peak Hour, Existing Geometry, Existing Conditions

Two-Way Stop



										Hobart Road														
										App		R	T	L										
										0		0	0											
										1		1	1											
										0.08		0.08	0.08											
										142		22	120											
										3		0	2											
										139		22	118											
										312		35	99	134	LV*									
										6		1	2	3	HV*									
										318		36	101	137	Total Vol*									
										0.08		0.07	0.07	0.07	D.o.S.									
										1		0	0	0	95th %ile Back of Queue (m)									
										0		0	0	0	Average Delay (sec)									
										Intersection		L	T	R	App									

### Two-Way Stop



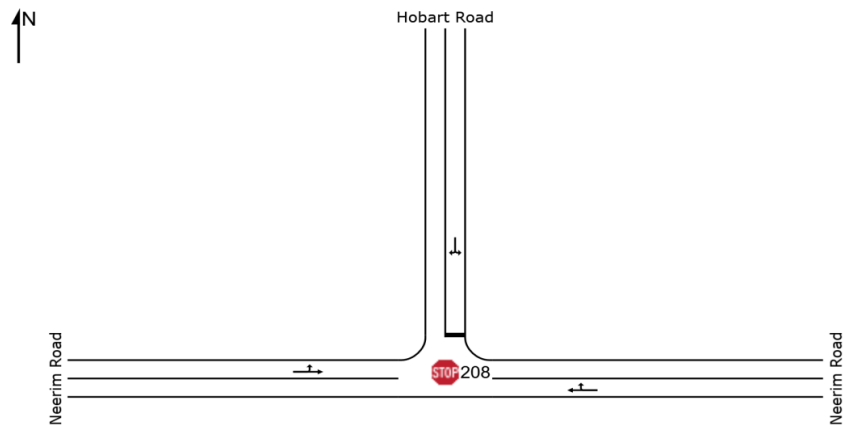
Hobart Road														
			App			R			T			L		
			1			2						0		
			6			6						6		
			0.19			0.19						0.19		
			186			77						109		
			4			2						2		
			182			75						107		
<b>Neerim Road</b>			L			T			R			App		
			0			0			0			0		
			0.08			39			1			38		
			0.08			107			2			105		
			0.08			146			3			143		
			601									274		
			12									80		
			613									194		
			0.19									6		
												280		
												82		
												198		
												0.16		
												4		
												0		
												1		
												0		
												App		
												R		
												T		
												L		
<b>Intersection</b> <b>L</b> <b>T</b> <b>R</b> <b>App</b>														
<b>LV*</b> <b>HV*</b> <b>Total Vol*</b> <b>D.o.S.</b> <b>95th %ile Back of Queue (m)</b> <b>Average Delay (sec)</b>														

\*Output Volumes



Neerim Road / Hobart Road  
PM Peak Hour, Existing Geometry, Existing Conditions

Two-Way Stop

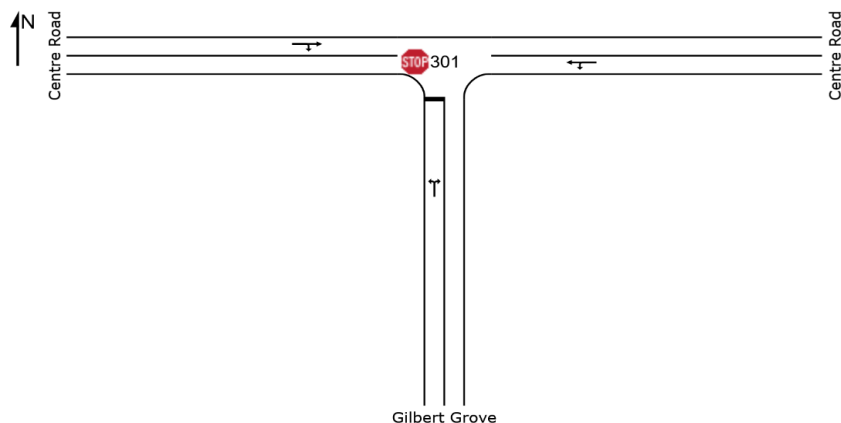


Hobart Road											

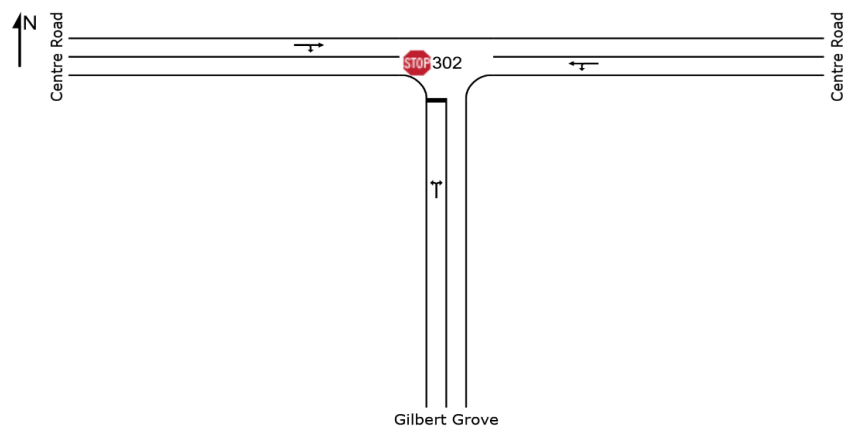
# ***Appendix C    SIDRA Intersection Results – Bentleigh***



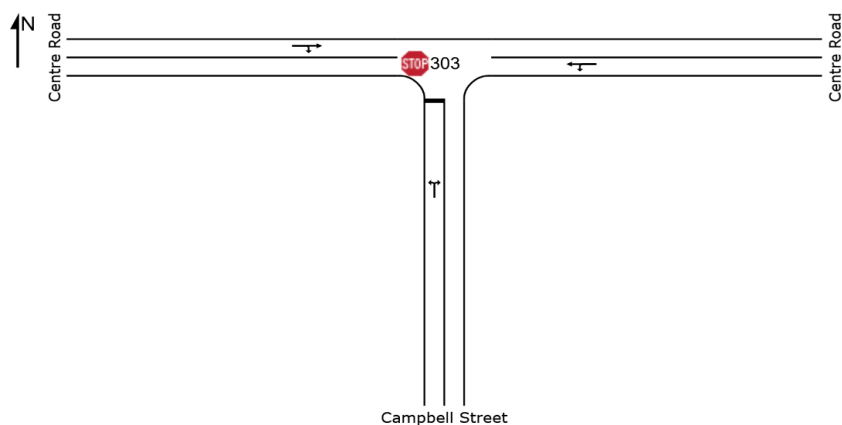
### Two-Way Stop

[illegible]

### Two-Way Stop

[illegible]

### Two-Way Stop

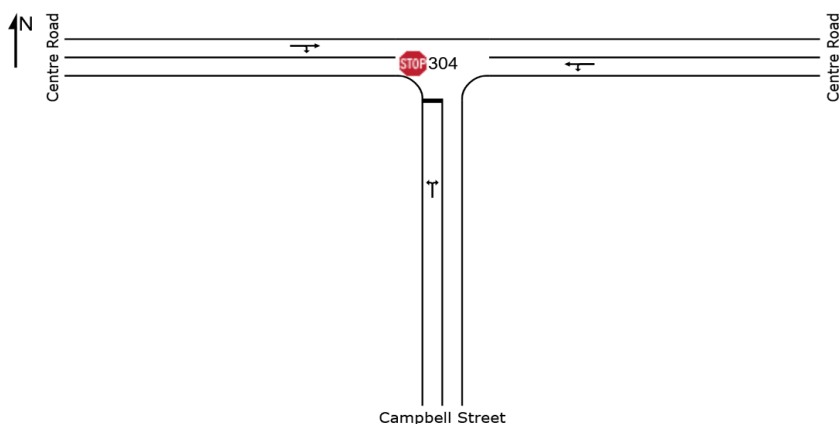


App	R	T	L
-----	---	---	---

[illegible]

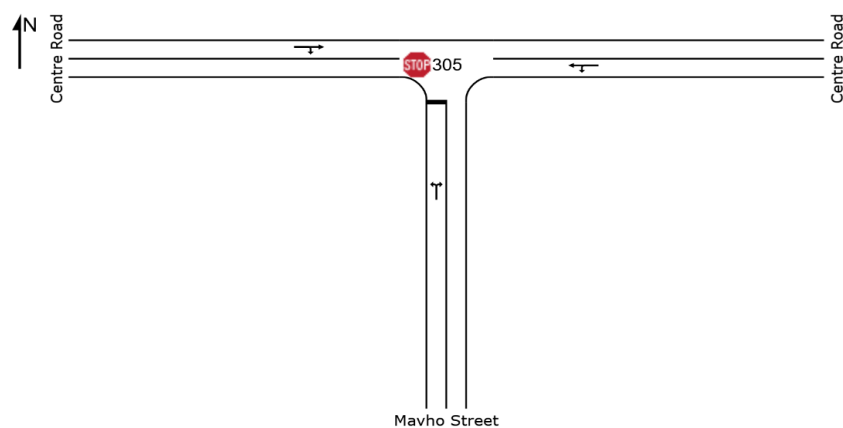


### Two-Way Stop



Campbell Street																
Centre Road																
Centre Road																
L	T	R	App	1	7	0.34	554	11	543	516	11	527	0.27	0	0	App
				3	7	0.34	55	1	54	506	10	516	0.27	0	0	R
				1	7	0.34	608	12	596	12	0	12	0.27	0	0	T
																L
							1155	34	8	42		LV*				
							24	1	0	1		HV*				
							1179	35	8	43		Total Vol*				
							0.34	0.07	0.07	0.07		D.o.S.				
							7	2	2	2		95th %ile Back of Queue (m)				
							1	3	11	4		Average Delay (sec)				
							Intersection	L	T	R	App					

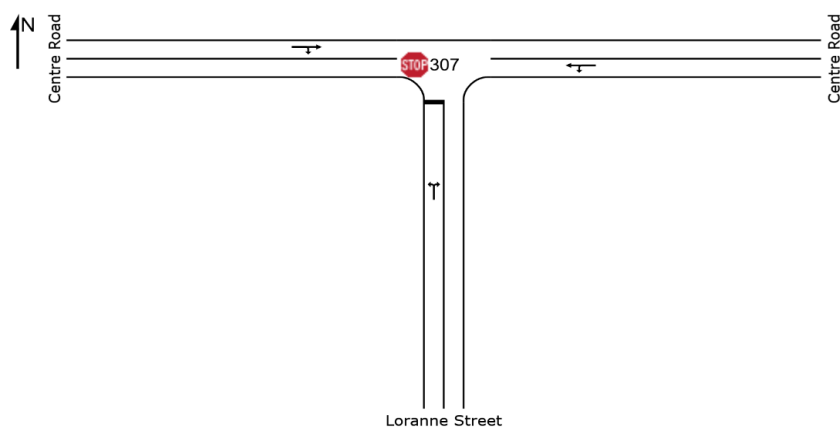
### Two-Way Stop

[illegible]

### Two-Way Stop

[illegible]

### Two-Way Stop



## Centre Road

0	0	<b>App</b>
		<b>R</b>
0	0	<b>T</b>
0	0	<b>L</b>

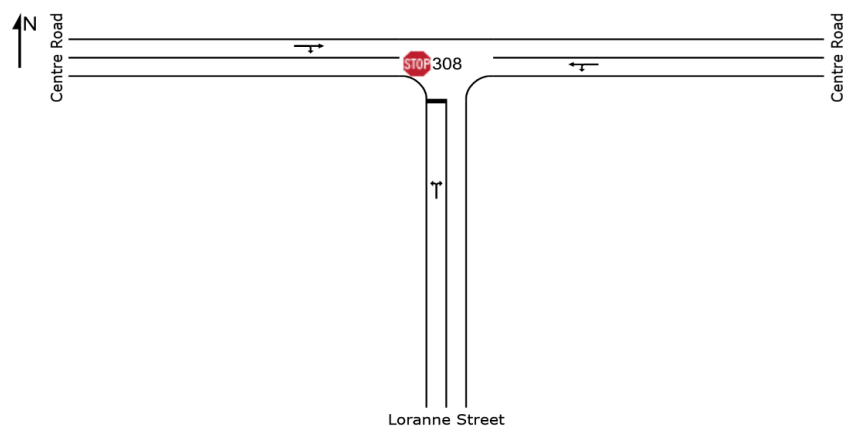
\*Output Volumes

95th %ile Back of Queue (m)  
Average Delay (sec)

## Intersection

**Loranne Street**

### Two-Way Stop

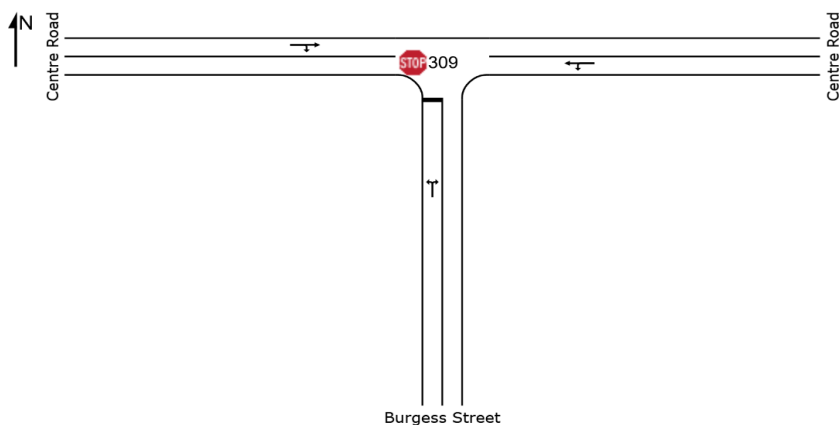


App	R	T	L
-----	---	---	---

[illegible]

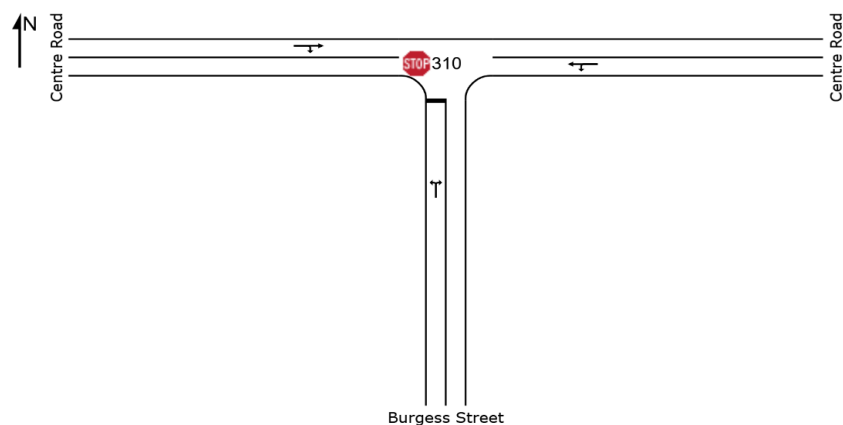


### Two-Way Stop

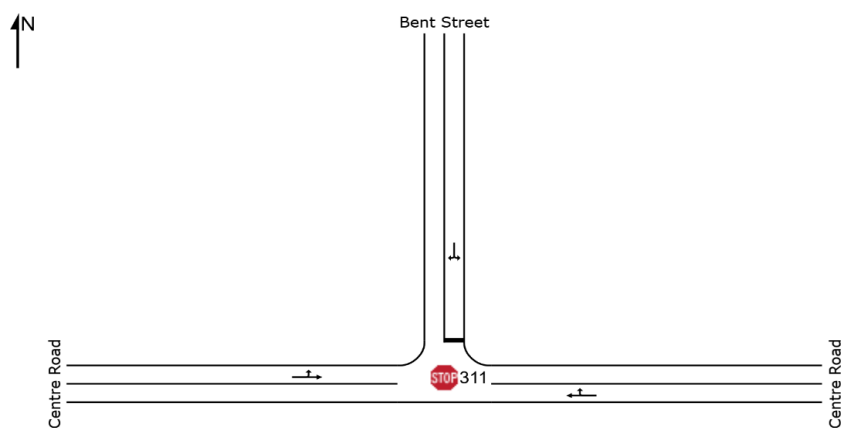


## Burgess Street

### Two-Way Stop

[illegible]

### Two-Way Stop



**Centre Road**

**Bent Street**

**Centre Road**

**Intersection**

Approach	L	T	R	App
Centre Road (Left)	0	0	0	0
Centre Road (Right)	2	0	2	2
Bent Street (Top)	5	7	2	14
Bent Street (Bottom)	3	3	3	9

**Delays (sec)**

Approach	L	T	R	App
Centre Road (Left)	0.23	0.23	0.23	0.23
Centre Road (Right)	0.28	0.28	0.28	0.28
Bent Street (Top)	0.11	0.11	0.11	0.11
Bent Street (Bottom)	0.11	0.11	0.11	0.11

**Output Volumes**

Approach	L	T	R	App
Centre Road (Left)	63	380	443	886
Centre Road (Right)	514	26	488	1028
Bent Street (Top)	58	38	20	116
Bent Street (Bottom)	57	37	20	114

**Delays (sec)**

Approach	L	T	R	App
Centre Road (Left)	0.23	0.23	0.23	0.23
Centre Road (Right)	0.28	0.28	0.28	0.28
Bent Street (Top)	0.11	0.11	0.11	0.11
Bent Street (Bottom)	0.11	0.11	0.11	0.11

**Output Volumes**

Approach	L	T	R	App
Centre Road (Left)	63	380	443	886
Centre Road (Right)	514	26	488	1028
Bent Street (Top)	58	38	20	116
Bent Street (Bottom)	57	37	20	114

**Delays (sec)**

Approach	L	T	R	App
Centre Road (Left)	0.23	0.23	0.23	0.23
Centre Road (Right)	0.28	0.28	0.28	0.28
Bent Street (Top)	0.11	0.11	0.11	0.11
Bent Street (Bottom)	0.11	0.11	0.11	0.11

**Output Volumes**

Approach	L	T	R	App
Centre Road (Left)	63	380	443	886
Centre Road (Right)	514	26	488	1028
Bent Street (Top)	58	38	20	116
Bent Street (Bottom)	57	37	20	114

**Delays (sec)**

Approach	L	T	R	App
Centre Road (Left)	0.23	0.23	0.23	0.23
Centre Road (Right)	0.28	0.28	0.28	0.28
Bent Street (Top)	0.11	0.11	0.11	0.11
Bent Street (Bottom)	0.11	0.11	0.11	0.11

**Output Volumes**

Approach	L	T	R	App
Centre Road (Left)	63	380	443	886
Centre Road (Right)	514	26	488	1028
Bent Street (Top)	58	38	20	116
Bent Street (Bottom)	57	37	20	114

**Delays (sec)**

Approach	L	T	R	App
Centre Road (Left)	0.23	0.23	0.23	0.23
Centre Road (Right)	0.28	0.28	0.28	0.28
Bent Street (Top)	0.11	0.11	0.11	0.11
Bent Street (Bottom)	0.11	0.11	0.11	0.11

**Output Volumes**

Approach	L	T	R	App
Centre Road (Left)	63	380	443	886
Centre Road (Right)	514	26	488	1028
Bent Street (Top)	58	38	20	116
Bent Street (Bottom)	57	37	20	114

**Delays (sec)**

Approach	L	T	R	App
Centre Road (Left)	0.23	0.23	0.23	0.23
Centre Road (Right)	0.28	0.28	0.28	0.28
Bent Street (Top)	0.11	0.11	0.11	0.11
Bent Street (Bottom)	0.11	0.11	0.11	0.11

**Output Volumes**

Approach	L	T	R	App
Centre Road (Left)	63	380	443	886
Centre Road (Right)	514	26	488	1028
Bent Street (Top)	58	38	20	116
Bent Street (Bottom)	57	37	20	114

**Delays (sec)**

Approach	L	T	R	App
Centre Road (Left)	0.23	0.23	0.23	0.23
Centre Road (Right)	0.28	0.28	0.28	0.28
Bent Street (Top)	0.11	0.11	0.11	0.11
Bent Street (Bottom)	0.11	0.11	0.11	0.11

**Output Volumes**

Approach	L	T	R	App
Centre Road (Left)	63	380	443	886
Centre Road (Right)	514	26	488	1028
Bent Street (Top)	58	38	20	116
Bent Street (Bottom)	57	37	20	114

**Delays (sec)**

Approach	L	T	R	App
Centre Road (Left)	0.23	0.23	0.23	0.23
Centre Road (Right)	0.28	0.28	0.28	0.28
Bent Street (Top)	0.11	0.11	0.11	0.11
Bent Street (Bottom)	0.11	0.11	0.11	0.11

**Output Volumes**

Approach	L	T	R	App
Centre Road (Left)	63	380	443	886
Centre Road (Right)	514	26	488	1028
Bent Street (Top)	58	38	20	116
Bent Street (Bottom)	57	37	20	114

**Delays (sec)**

Approach	L	T	R	App
Centre Road (Left)	0.23	0.23	0.23	0.23
Centre Road (Right)	0.28	0.28	0.28	0.28
Bent Street (Top)	0.11	0.11	0.11	0.11
Bent Street (Bottom)	0.11	0.11	0.11	0.11

**Output Volumes**

Approach	L	T	R	App
Centre Road (Left)	63	380	443	886
Centre Road (Right)	514	26	488	1028
Bent Street (Top)	58	38	20	116
Bent Street (Bottom)	57	37	20	114

**Delays (sec)**

Approach	L	T	R	App
Centre Road (Left)	0.23	0.23	0.23	0.23
Centre Road (Right)	0.28	0.28	0.28	0.28
Bent Street (Top)	0.11	0.11	0.11	0.11
Bent Street (Bottom)	0.11	0.11	0.11	0.11

**Output Volumes**

Approach	L	T	R	App
Centre Road (Left)	63	380	443	886
Centre Road (Right)	514	26	488	1028
Bent Street (Top)	58	38	20	116
Bent Street (Bottom)	57	37	20	114

**Delays (sec)**

Approach	L	T	R	App
Centre Road (Left)	0.23	0.23	0.23	0.23
Centre Road (Right)	0.28	0.28	0.28	0.28
Bent Street (Top)	0.11	0.11	0.11	0.11
Bent Street (Bottom)	0.11	0.11	0.11	0.11

**Output Volumes**

Approach	L	T	R	App
Centre Road (Left)	63	380	443	886
Centre Road (Right)	514	26	488	1028
Bent Street (Top)	58	38	20	116
Bent Street (Bottom)	57	37	20	114

**Delays (sec)**

Approach	L	T	R	App
Centre Road (Left)	0.23	0.23	0.23	0.23
Centre Road (Right)	0.28	0.28	0.28	0.28
Bent Street (Top)	0.11	0.11	0.11	0.11
Bent Street (Bottom)	0.11	0.11	0.11	0.11

**Output Volumes**

Approach	L	T	R	App
Centre Road (Left)	63	380	443	886
Centre Road (Right)	514	26	488	1028
Bent Street (Top)	58	38	20	116
Bent Street (Bottom)	57	37	20	114

**Delays (sec)**

Approach	L	T	R	App
Centre Road (Left)	0.23	0.23	0.23	0.23
Centre Road (Right)	0.28	0.28	0.28	0.28
Bent Street (Top)	0.11	0.11	0.11	0.11
Bent Street (Bottom)	0.11	0.11	0.11	0.11

**Output Volumes**

Approach	L	T	R	App
Centre Road (Left)	63	380	443	886
Centre Road (Right)	514	26	488	1028
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**Delays (sec)**

Approach	L	T	R	App
Centre Road (Left)	0.23	0.23	0.23	0.23
Centre Road (Right)	0.28	0.28	0.28	0.28
Bent Street (Top)	0.11	0.11	0.11	0.11
Bent Street (Bottom)	0.11	0.11	0.11	0.11

**Output Volumes**

Approach	L	T	R	App
Centre Road (Left)	63	380	443	886
Centre Road (Right)	514	26	488	1028
Bent Street (Top)	58	38	20	116
Bent Street (Bottom)	57	37	20	114

**Delays (sec)**

Approach	L	T	R	App
Centre Road (Left)	0.23	0.23	0.23	0.23
Centre Road (Right)	0.28	0.28	0.28	0.28
Bent Street (Top)	0.11	0.11	0.11	0.11
Bent Street (Bottom)	0.11	0.11	0.11	0.11

**Output Volumes**

Approach	L	T	R	App
Centre Road (Left)	63	380	443	886
Centre Road (Right)	514	26	488	1028
Bent Street (Top)	58	38	20	116
Bent Street (Bottom)	57	37	20	114

**Delays (sec)**

Approach	L	T	R	App
Centre Road (Left)	0.23	0.23	0.23	0.23
Centre Road (Right)	0.28	0.28	0.28	0.28
Bent Street (Top)	0.11	0.11	0.11	0.11
Bent Street (Bottom)	0.11	0.11	0.11	0.11

**Output Volumes**

Approach	L	T	R	App
Centre Road (Left)	63	380	443	886
Centre Road (Right)	514	26	488	1028
Bent Street (Top)	58	38	20	116
Bent Street (Bottom)	57	37	20	114

**Delays (sec)**

Approach	L	T	R	App
Centre Road (Left)	0.23	0.23	0.23	0.23
Centre Road (Right)	0.28	0.28	0.28	0.28
Bent Street (Top)	0.11	0.11	0.11	0.11
Bent Street (Bottom)	0.11	0.11	0.11	0.11

**Output Volumes**

Approach	L	T	R	App
Centre Road (Left)	63	380	443	886
Centre Road (Right)	514	26	488	1028
Bent Street (Top)	58	38	20	116
Bent Street (Bottom)	57	37	20	114

**Delays (sec)**

Approach	L	T	R	App
Centre Road (Left)	0.23	0.23	0.23	0.23
Centre Road (Right)	0.28	0.28	0.28	0.28
Bent Street (Top)	0.11	0.11	0.11	0.11
Bent Street (Bottom)	0.11	0.11	0.11	0.11

**Output Volumes**

Approach	L	T	R	App
Centre Road (Left)	63	380	443	886
Centre Road (Right)	514	26	488	1028
Bent Street (Top)	58	38	20	116
Bent Street (Bottom)	57	37	20	114

**Delays (sec)**

Approach	L	T	R	App
Centre Road (Left)	0.23	0.23	0.23	0.23
Centre Road (Right)	0.28	0.28	0.28	0.28
Bent Street (Top)	0.11	0.11	0.11	0.11
Bent Street (Bottom)	0.11	0.11	0.11	0.11

**Output Volumes**

Approach	L	T	R	App
Centre Road (Left)	63	380	443	886
Centre Road (Right)	514	26	488	1028
Bent Street (Top)	58	38	20	116
Bent Street (Bottom)	57	37	20	114

**Delays (sec)**

Approach	L	T	R	App
Centre Road (Left)	0.23	0.23	0.23	0.23
Centre Road (Right)	0.28	0.28	0.28	0.28
Bent Street (Top)	0.11	0.11	0.11	0.11
Bent Street (Bottom)	0.11	0.11	0.11	0.11

**Output Volumes**

Approach	L	T	R	App
Centre Road (Left)	63	380	443	886
Centre Road (Right)	514	26	488	1028
Bent Street (Top)	58	38	20	116
Bent Street (Bottom)	57	37	20	114

**Delays (sec)**

Approach	L	T	R	App
Centre Road (Left)	0.23	0.23	0.23	0.23
Centre Road (Right)	0.28	0.28	0.28	0.28
Bent Street (Top)	0.11	0.11	0.11	0.11
Bent Street (Bottom)	0.11	0.11	0.11	0.11

**Output Volumes**

Approach	L	T	R	App
Centre Road (Left)	63	380	443	886
Centre Road (Right)	514	26	488	1028
Bent Street (Top)	58	38	20	116
Bent Street (Bottom)	57	37	20	114

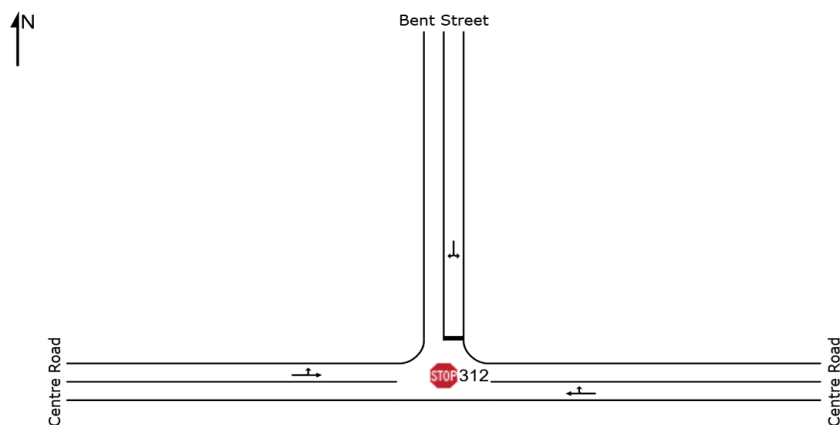
**Delays (sec)**

Approach	L	T	R	App
Centre Road (Left)	0.23	0.23	0.23	0.23
Centre Road (Right)	0.28	0.28	0.28	0.28
Bent Street (Top)	0.11	0.11	0.11	0.11
Bent Street (Bottom)	0.11	0.11	0.11	0.11

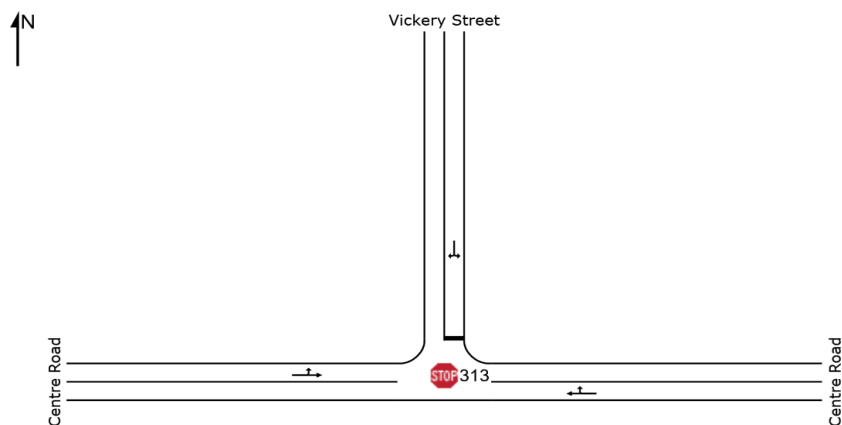
**Output Volumes**













Approach	L	T	R	App
Centre Road (Left)				

### Two-Way Stop

[illegible]

### Two-Way Stop

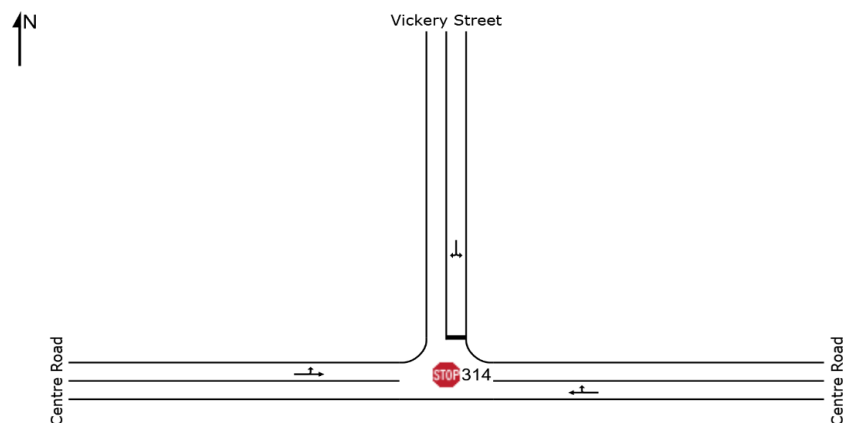


Vickery Street																
				App		R		T		L						
				5		7				2						
				3		3				3						
				0.13		0.13				0.13						
				71		42				28						
				1		1				1						
				70		41				27						
Centre Road												Centre Road				
L	0	0	0.21	21	0	21				536	11	547	0.3	4	0	App
T	0	0	0.21	386	8	378				42	1	43	0.3	4	2	R
R										494	10	504	0.3	4	0	T
App	0	0	0.21	407	8	399										L
				1004								LV*				
				21								HV*				
				1025								Total Vol*				
				0.3								D.o.S.				
				4								95th %ile Back of Queue (m)				
				1								Average Delay (sec)				
Intersection				L		T		R		App						

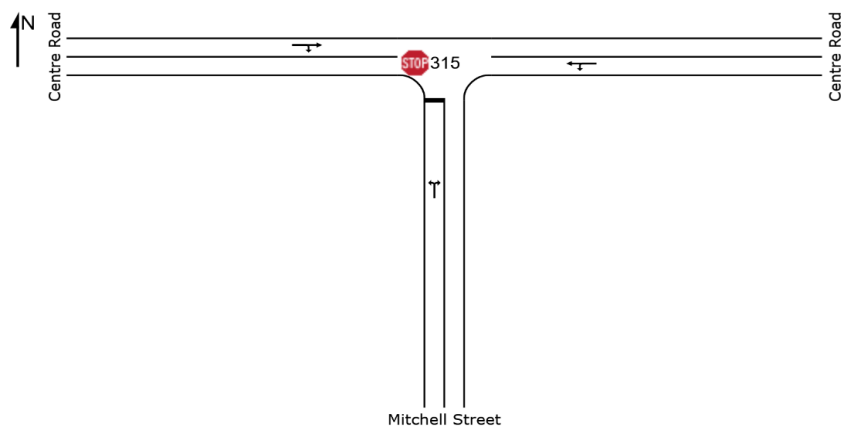
\*Output Volumes



### Two-Way Stop

[illegible]

### Two-Way Stop



## Centre Road

0	0	<b>App</b>
		<b>R</b>
0	0	<b>T</b>
0	0	<b>L</b>

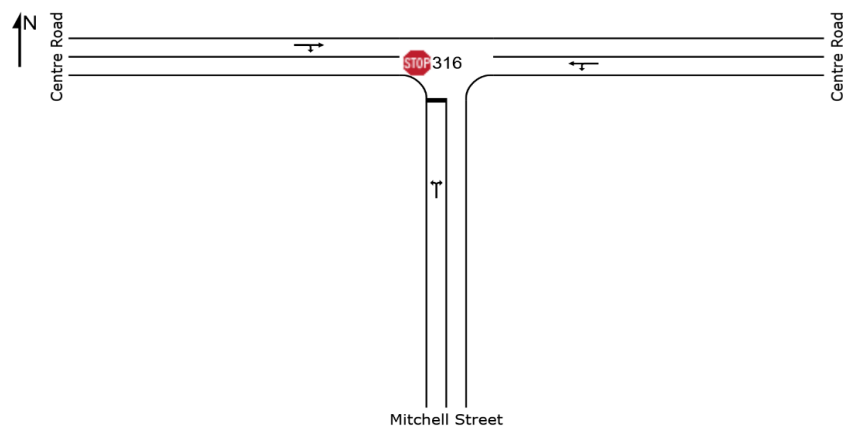
\*Output Volumes

95th %ile Back of Queue (m)  
Average Delay (sec)

## Intersection

**Mitchell Street**

### Two-Way Stop



## Centre Road

0	0	<b>App</b>
		<b>R</b>
0	0	<b>T</b>
0	0	<b>L</b>

\*Output Volumes

95th %ile Back of Queue (m)  
Average Delay (sec)

**Mitchell Street**

### Two-Way Stop

[illegible]

### Two-Way Stop



**Godfrey Street**

**Centre Road**

Approach	L	T	R	App	Volume	Delay	Queue
North (Godfrey Street)	0	0	0	0	0	0	0
South (Godfrey Street)	0	0	0	0	0	0	0
East (Centre Road)	4	1	3	0	8	0.29	4
West (Centre Road)	4	3	0	0	7	0.29	4

**Intersection**

**Godfrey Street**

**Centre Road**

**Approach**

**Volume**

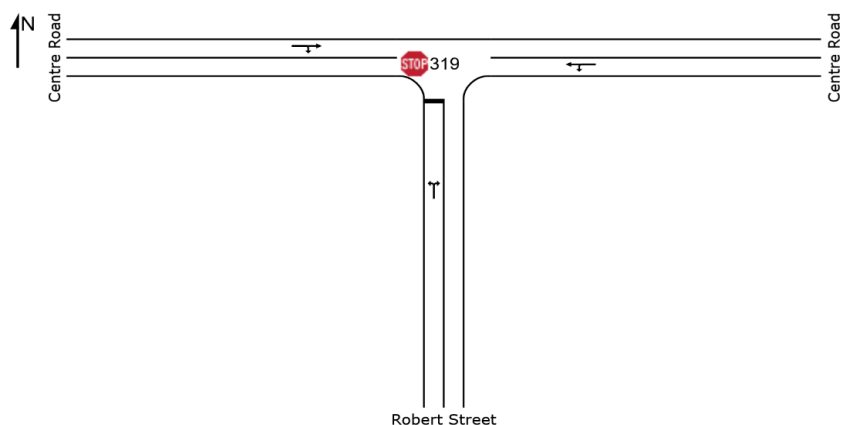
**Delay**

**Queue**

**Legend:**

- LV\*: Left Turn Volume
- HV\*: Heavy Vehicle Volume
- Total Vol\*: Total Volume
- D.o.S.: Degree of Saturation
- 95th %ile Back of Queue (m): 95th Percentile Back of Queue (meters)
- Average Delay (sec): Average Delay (seconds)

### Two-Way Stop



Centre Road										Centre Road									
L	T	R	App	Intersection				Robert Street				Centre Road							
				L	T	R	App	L	T	R	App								
0.22	0.22	0.22		384	8	376	577	12	589	0.31	0	0	App						
16	0	16		16	0	16	558	11	569	0.31	0	0	R						
400	8	392		20	0	20	20	0	20	0.31	0	0	T						
				985	13	3	16	LV*											
				20	0	0	0	HV*											
				1005	13	3	16	Total Vol*											
				0.31	0.02	0.02	0.02	D.o.S.											
				2	1	1	1	95th %ile Back of Queue (m)											
				0	3	7	4	Average Delay (sec)											

\*Output Volumes



### Two-Way Stop

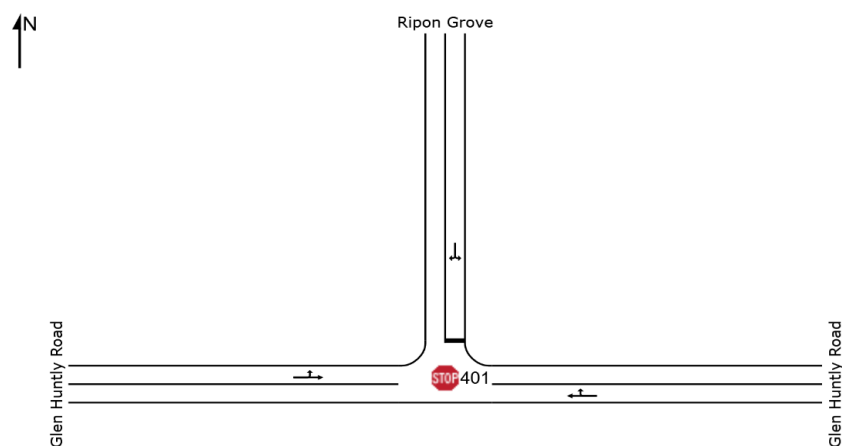














Centre Road										Centre Road									
L	T	R	App	Intersection				Robert Street				Centre Road							
				L	T	R	App	L	T	R	App								
0.27	0.27	0.27	0.28	1054	18	2	20	535	11	546	0.28	0	0	0	0				
22	0	0	0	22	0	0	0	22	0	0	0	0	0	0	0				
1076	18	2	20	1076	18	2	20	1076	18	2	20	1076	18	2	20				
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03				
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1				
0	3	7	3	0	3	7	3	0	3	7	3	0	3	7	3				
				95th %ile Back of Queue (m)															
				Average Delay (sec)															

## ***Appendix D    SIDRA Intersection Results – Elsternwick***



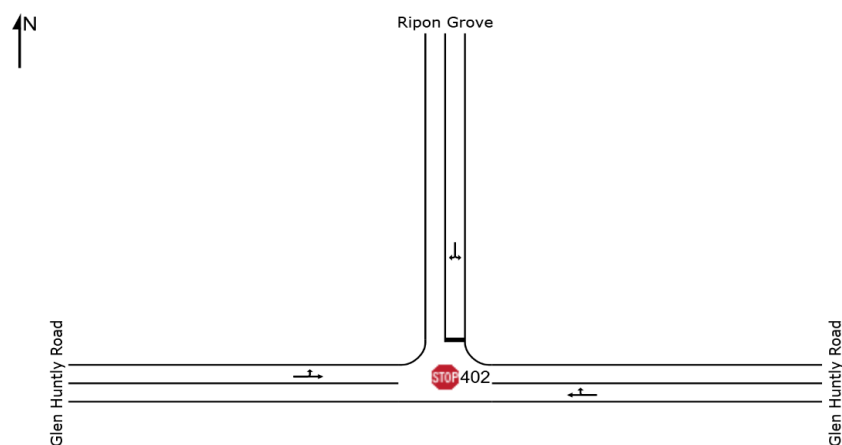
### Two-Way Stop

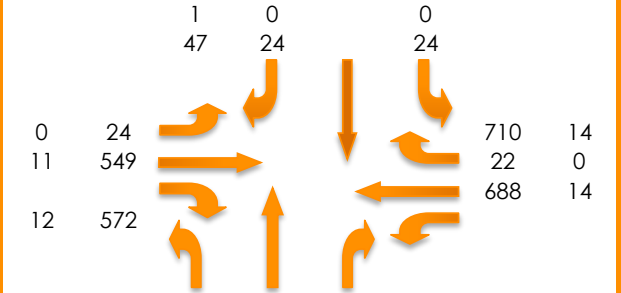


Ripon Grove																							
				App		R		T		L													
				8		18				3													
				2		2				2													
				0.08		0.08				0.08													
				33		9				23													
				1		0				0													
				32		9				23													
Glen Huntly Road																				Glen Huntly Road			
L	0	0	0.36	32	1	31							806	16	822	0.49	4	0	App				
T	0	0	0.36	585	12	573							21	0	21	0.49	4	6	R				
R													785	16	801	0.49	4	0	T				
App	0	0	0.36	617	12	605													L				
				1443										LV*									
				29										HV*									
				1472										Total Vol*									
				0.49										D.o.S.									
				4										95th %ile Back of Queue (m)									
				0										Average Delay (sec)									
				Intersection		L		T		R		App											

\*Output Volumes

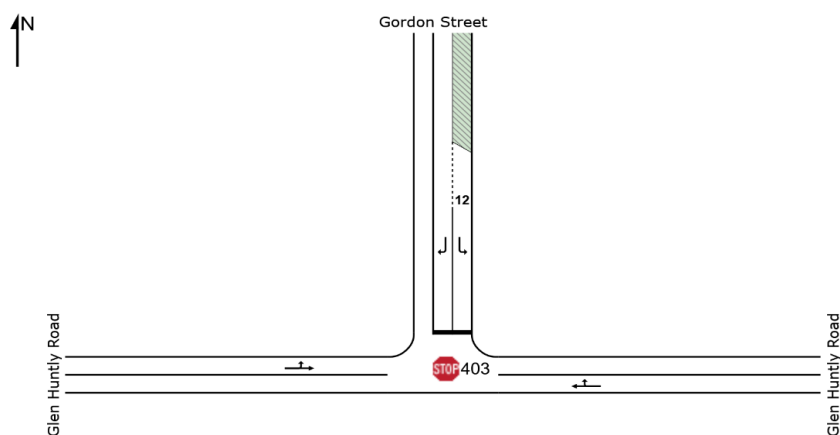
### Two-Way Stop



Ripon Grove																					
				App			R			T			L								
				9			14						3								
				3			3						3								
				0.13			0.13						0.13								
				48			24						24								
				1			0						0								
				47			24						24								
Glen Huntly Road																		Glen Huntly Road			
L	0	0	0.34	24	0	24							710	14	724	0.43	3	0	App		
T	0	0	0.34	560	11	549							22	0	22	0.43	3	5	R		
R													688	14	702	0.43	3	0	T		
App	0	0	0.34	584	12	572													L		
				1330									LV*								
				27									HV*								
				1357									Total Vol*								
				0.43									D.o.S.								
				3									95th %ile Back of Queue (m)								
				1									Average Delay (sec)								
				Intersection			L			T			R			App					

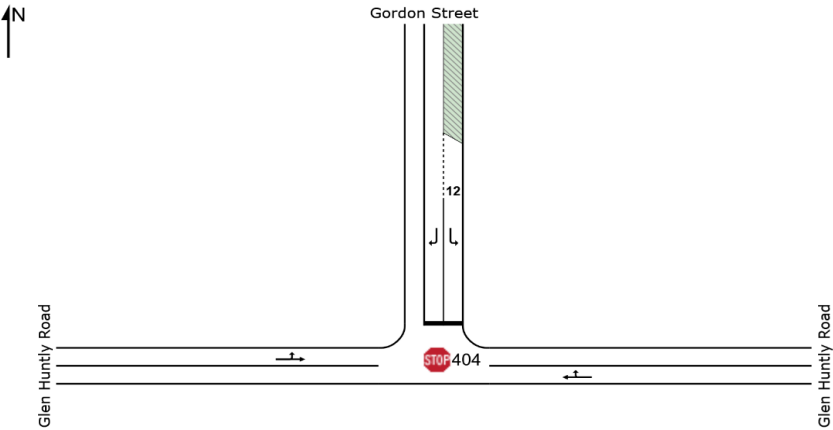
\*Output Volumes

### Two-Way Stop

[illegible]

Glen Huntly Road / Gordon Street  
PM Peak Hour, Existing Geometry, Existing Conditions

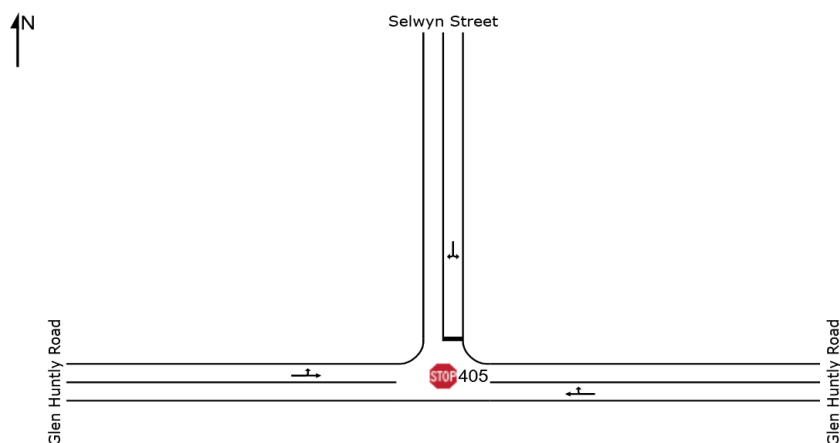
Two-Way Stop



Glen Huntly Road													
Gordon Street													
App													
R													
T													
L													
0.31													
0.31													
0.06													
134													
85													
48													
3													
2													
1													
47													
Glen Huntly Road													
L													
0													
0													
0.34													
77													
2													
75													
647													
13													
660													
0.39													
3													
0													
App													
R													
3													
4													
T													
3													
0													
L													
0.34													
584													
12													
572													
1350													
28													
1378													
0.39													
8													
1													
Intersection													
L													
T													
R													
App													
LV*													
HV*													
Total Vol*													
D.o.S.													
95th %ile Back of Queue (m)													
Average Delay (sec)													

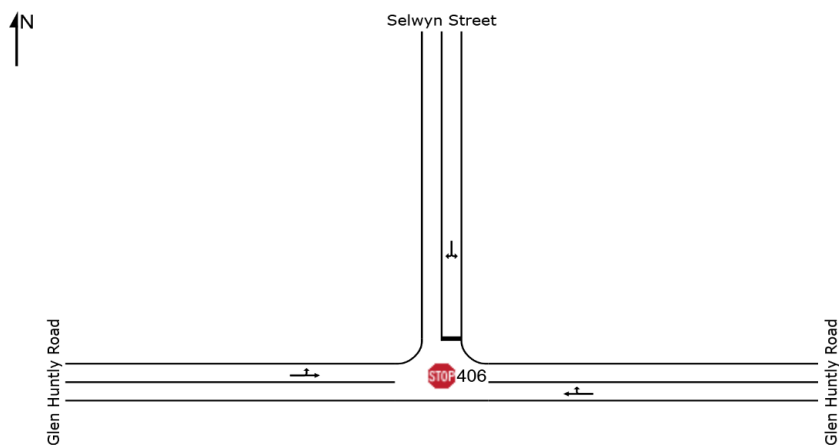
\*Output Volumes

### Two-Way Stop

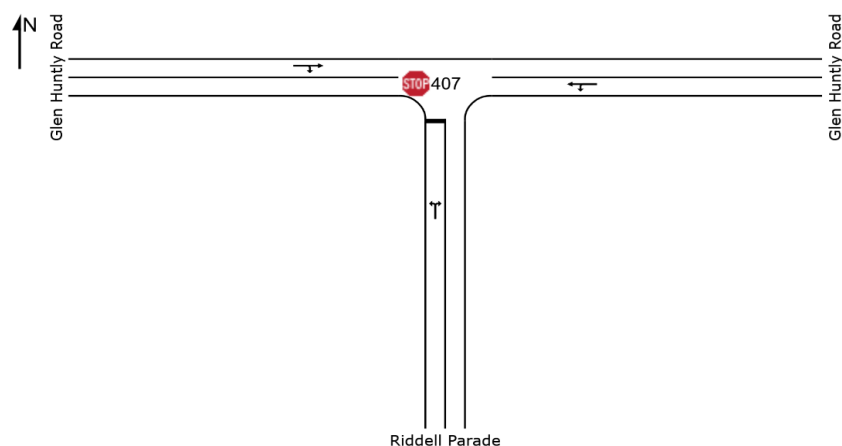
[illegible]



### Two-Way Stop

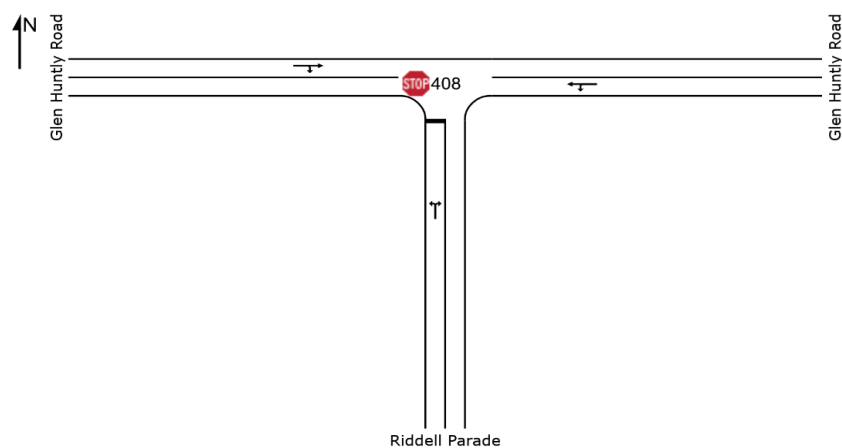
[illegible]

### Two-Way Stop



## Riddell Parade

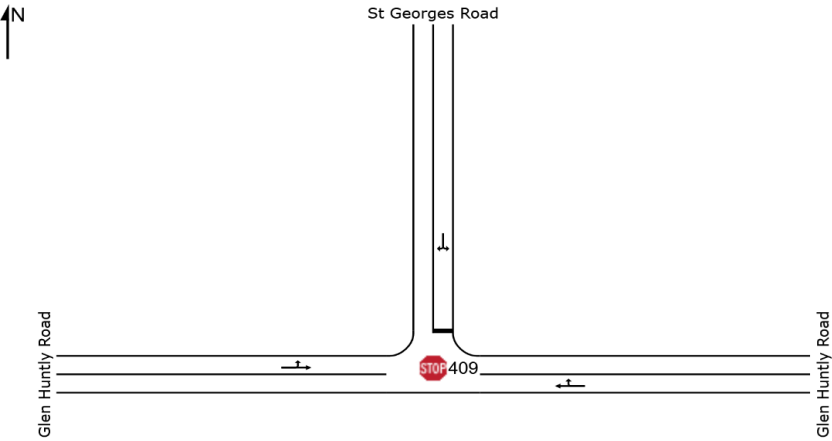
### Two-Way Stop



	0.07	0.20	0.20	0.20	0.0000
15	7		7	7	95th %ile Back of Queue (m)
2	3		11	4	Average Delay (sec)
Intersection	L	T	R	App	
Riddell Parade					

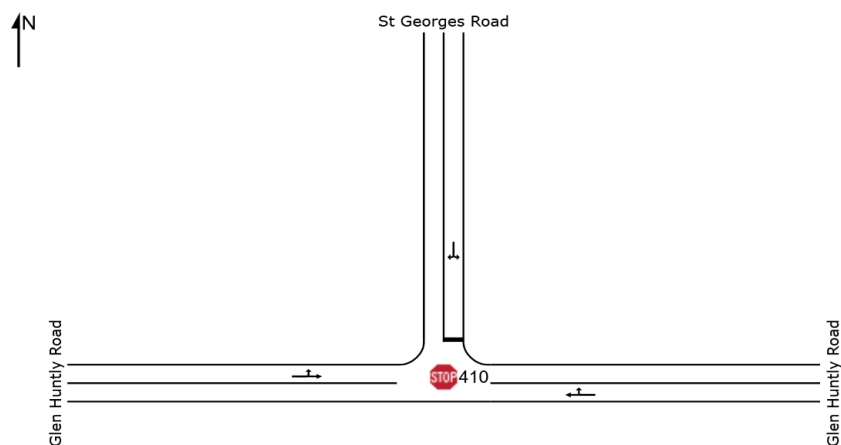
Glen Huntly Road / St Georges Road  
AM Peak Hour, Existing Geometry, Existing Conditions

Two-Way Stop



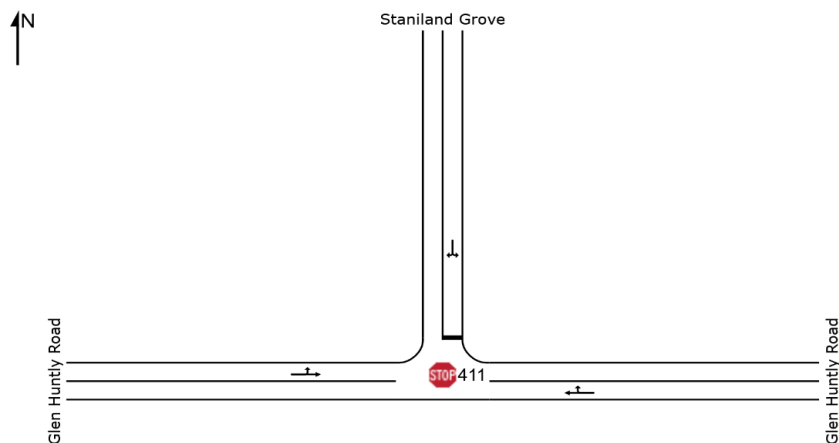
St Georges Road												

### Two-Way Stop



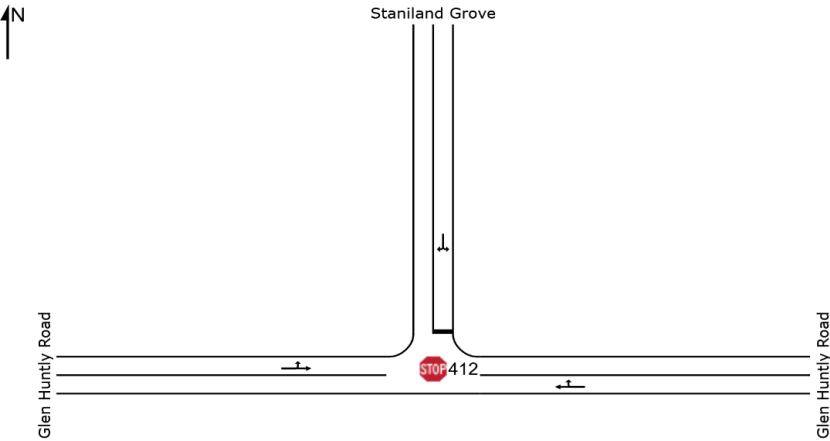
																St Georges Road																															
																App	R	T	L																												
																4	8		2																												
																5	5		5																												
																0.19	0.19		0.19																												
																119	51		68																												
																2	1		1																												
																117	50		67																												
Glen Huntly Road																										Glen Huntly Road																					
L	0	0	0.25	54	1	53					531	11	542	0.32	3	0	App																														
T	0	0	0.25	383	8	375					31	1	32	0.32	3	2	R																														
R											501	10	511	0.32	3	0	T																														
App	0	0	0.25	437	9	428											L																														
																LV* HV* Total Vol* D.o.S.																															
																95th %ile Back of Queue (m) Average Delay (sec)																															
																1076 22 1098 0.32 5 1																															
																Intersection    L    T    R    App																															

### Two-Way Stop

[illegible]

Glen Huntly Road / Staniland Grove  
 PM Peak Hour, Existing Geometry, Existing Conditions

Two-Way Stop

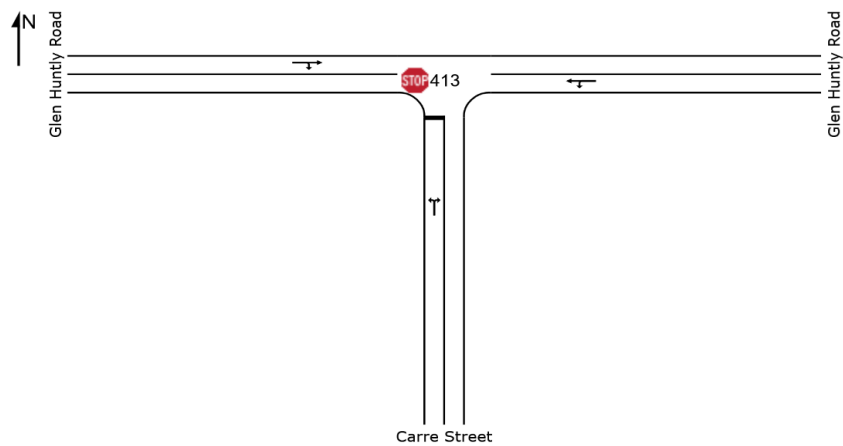


Staniland Grove														

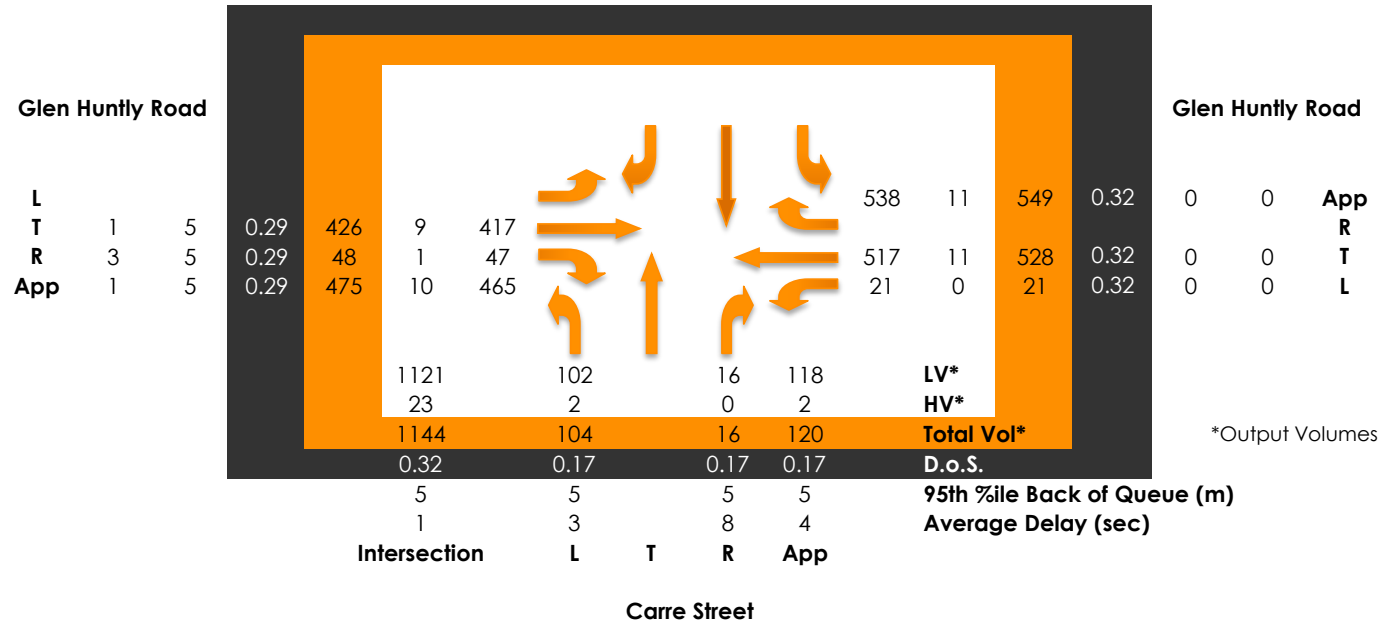


Glen Huntly Road / Carre Street  
AM Peak Hour, Existing Geometry, Existing Conditions

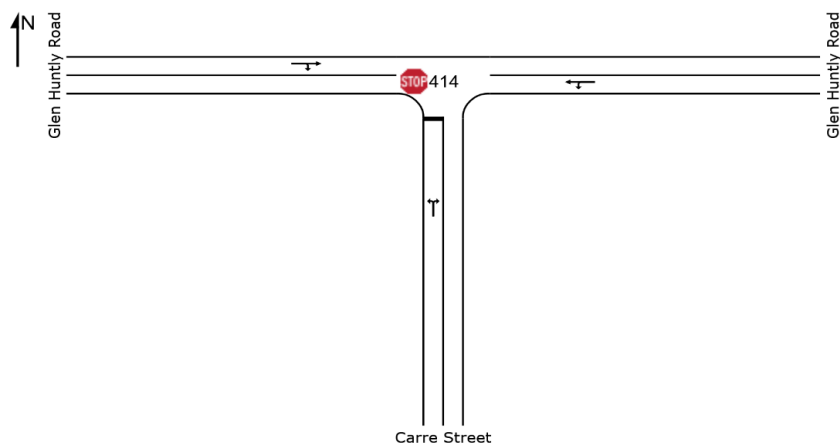
Two-Way Stop



App R T L



### Two-Way Stop



	0.32	0.33	0.35	0.38	0.40
3	2	2	2	2	95th %ile Back of Queue (m)
0	3	7	4		Average Delay (sec)
Intersection	L	T	R	App	
Carre Street					

## Signals



Phase	Grn	Yel	Red	Total	%
A	38	4	2	44	48.89
C	17	4	2	23	25.56
F	17	4	2	23	25.56

## Orrong Road

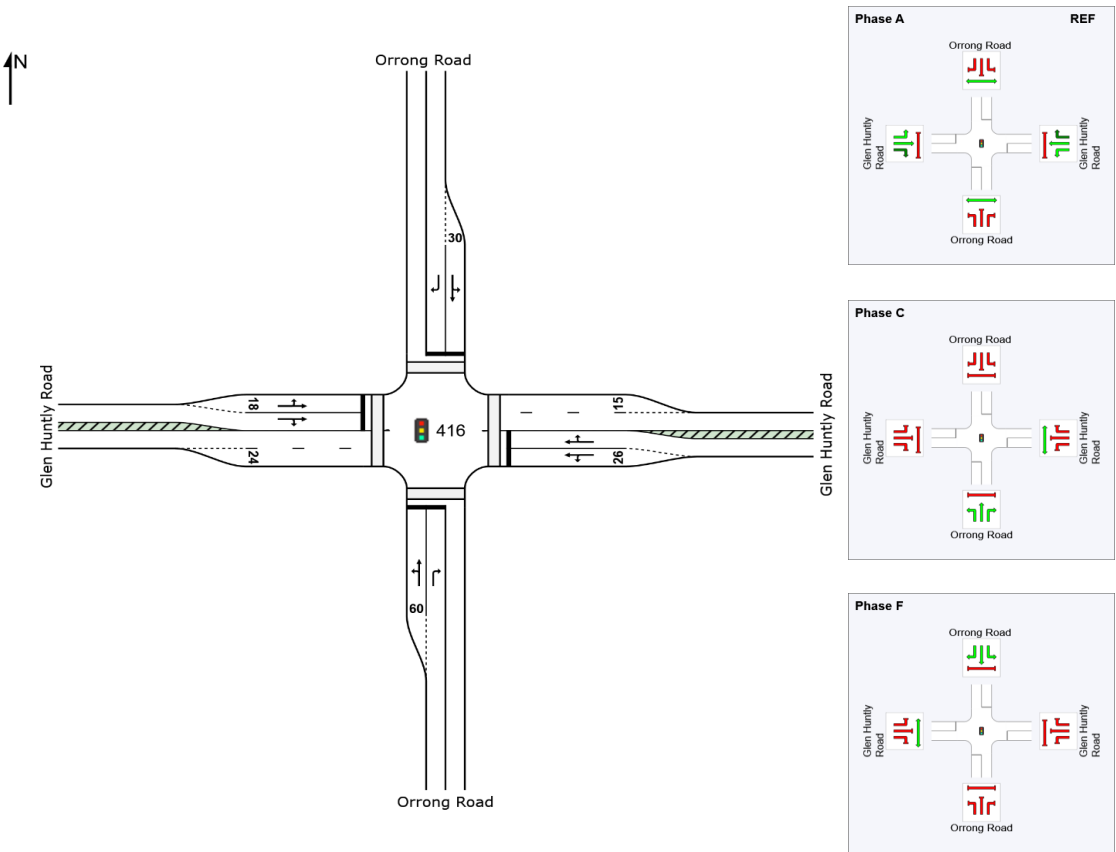
90

															90					
															App	R	T	L		
															42	46	39	39		
															68	64	68	68		
															0.8	0.8	0.74	0.74		
<b>Glen Huntly Road</b>															412	191	139	82		
															8	4	3	2		
															404	187	136	80		
L	17	20	0.15	106	2	104			504	10	514	0.85	127	33	App					
T	20	66	0.48	293	6	287			123	3	126	0.85	127	38	R					
R	20	66	0.48	8	0	8			342	7	349	0.85	127	33	T					
App	19	66	0.48	407	8	399			37	1	38	0.19	26	17	L					
															1680	24	273	76	373	LV*
															34	0	6	2	8	HV*
															1714	24	279	78	381	Total Vol*
															0.85	0.84	0.84	0.29	0.84	D.o.S.
															127	103	103	23	103	95th %ile Back of Queue (m)
															34	45	45	38	43	Average Delay (sec)
<b>Intersection</b>															L	T	R	App		
															<b>Orrong Road</b>					

\*Output Volumes

Glen Huntly Road / Orrong Road  
PM Peak Hour, Existing Geometry, Existing Conditions

Signals



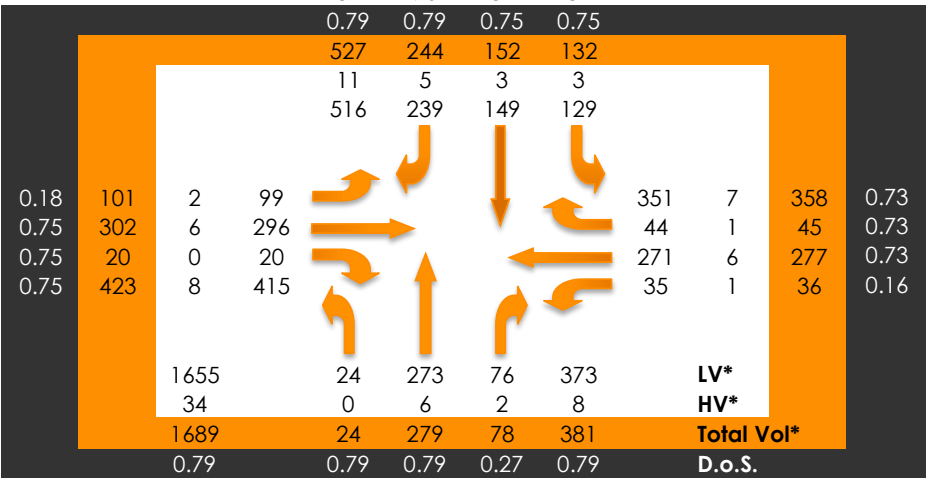
Phase	Grn	Yel	Red	Total	%
A	30	4	2	36	40
C	18	4	2	24	26.67
F	24	4	2	30	33.33

Orrong Road

90

Glen Huntly Road

L	23	23
T	32	93
R	32	93
App	30	93



Glen Huntly Road

App	80	32
R	80	36
T	80	33
L	20	23

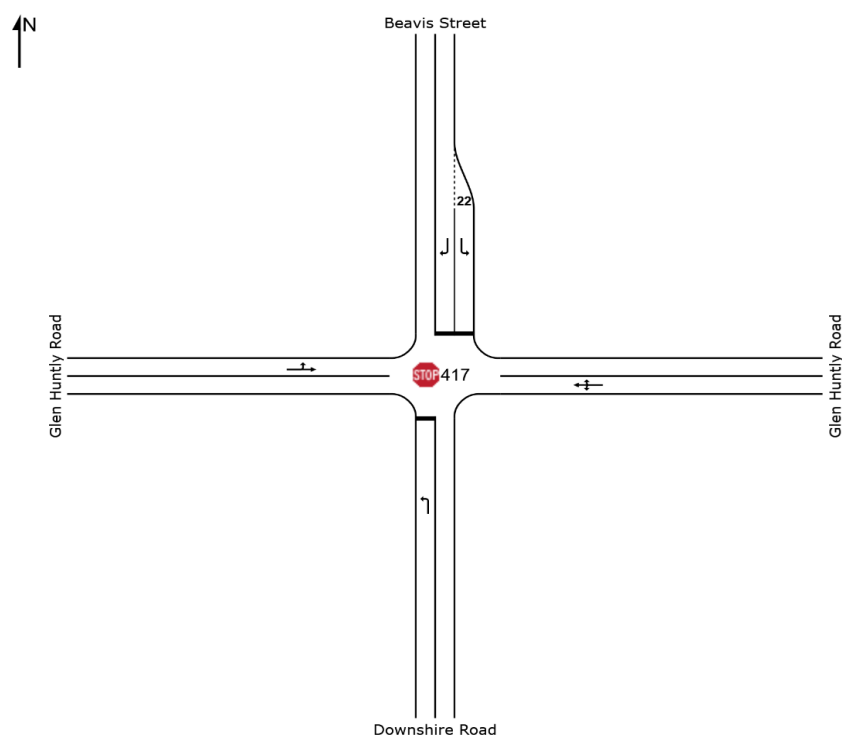
\*Output Volumes

Intersection

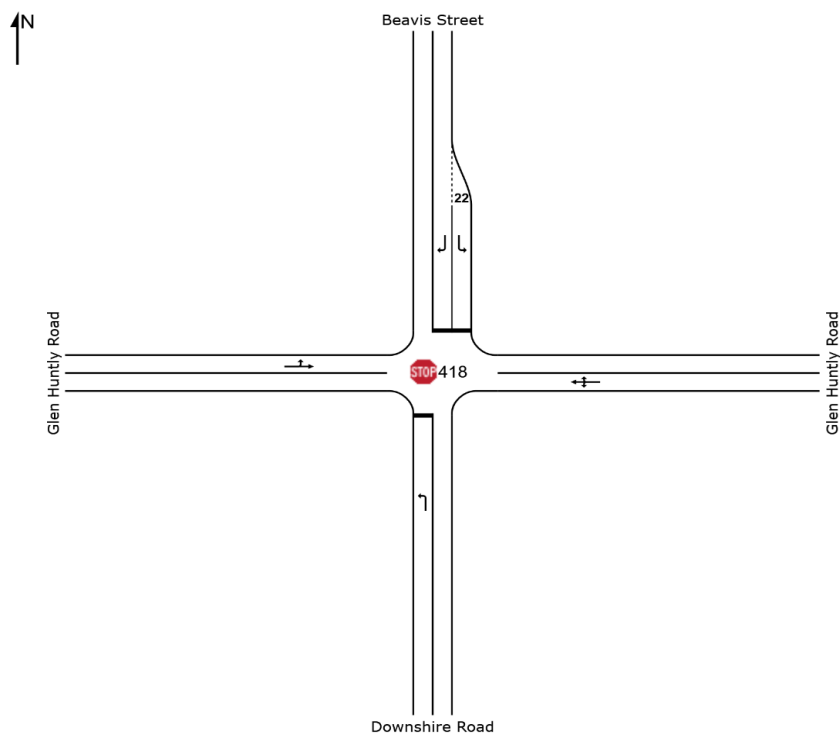
Orrong Road

95th %ile Back of Queue (m)  
Average Delay (sec)

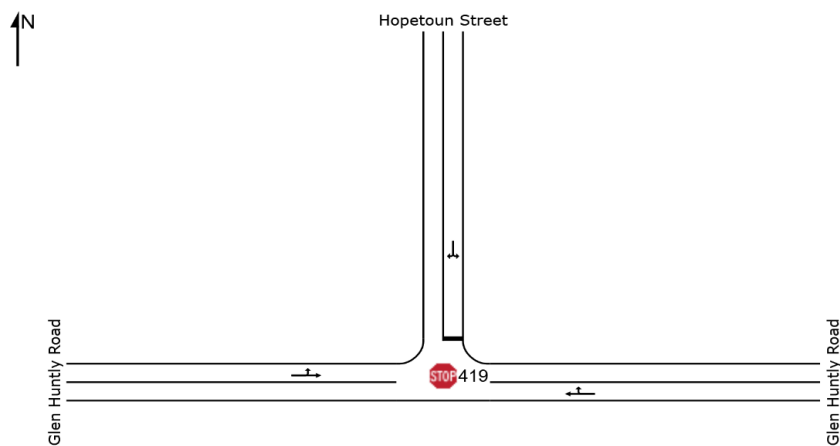
### Two-Way Stop
















[illegible]

### Two-Way Stop

[illegible]

### Two-Way Stop



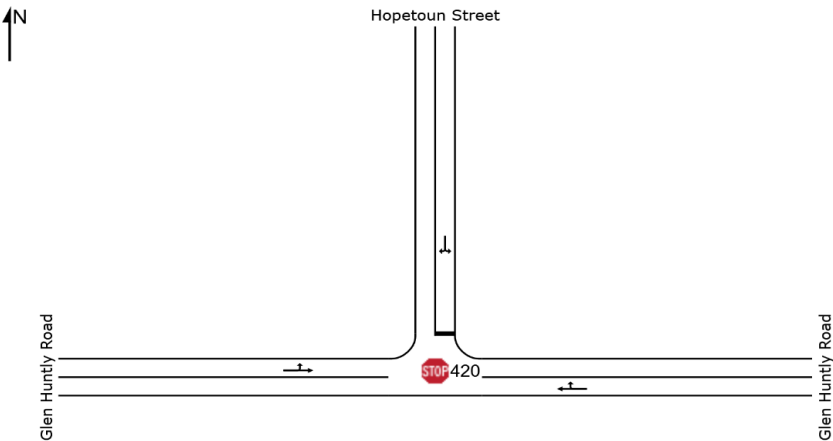
										Hopetoun Street														
										App		R	T	L										
										3		8		2										
										2		2		2										
										0.08		0.08		0.08										
										58		11		47										
										1		0		1										
<b>Glen Huntly Road</b>										57		11		46										
L	0	0	0.26	33	1	32					576	12	588	0.37	8	1	<b>App</b>							
T	0	0	0.26	418	8	410					79	2	81	0.37	8	3	<b>R</b>							
R											497	10	507	0.37	8	1	<b>T</b>							
<b>App</b>	0	0	0.26	451	9	442											<b>L</b>							
										1075				<b>LV*</b>										
										22				<b>HV*</b>										
										1097				<b>Total Vol*</b>										
										0.37				<b>D.o.S.</b>										
										8				<b>95th %ile Back of Queue (m)</b>										
										1				<b>Average Delay (sec)</b>										
<b>Intersection</b>										L	T	R	App											

\*Output Volumes



Glen Huntly Road / Hopetoun Street  
 PM Peak Hour, Existing Geometry, Existing Conditions

Two-Way Stop



Hopetoun Street																

\*Output Volumes