Traffic and Transport Assessment

Brompton Lodge PSP

CG150179

Prepared for
MPA

10 November 2015

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Shaping the Future

Document Information

Prepared for	MPA
Project Name	Brompton Lodge PSP
File Reference	CG150179Rep01F01.docx
Job Reference	CG150179
Date	10 November 2015

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Document Control

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1 Introduction

Cardno was retained by MPA to undertake a traffic assessment, analysis, design and costings for the proposed Brompton Lodge PSP Area.

This report considers and assesses the road network in the interim (2026) and ultimate scenarios (2046) Brompton Lodge PSP road frontages, and recommends various intersection treatments in order to facilitate future traffic movements through the PSP area.

2 Brompton Lodge PSP

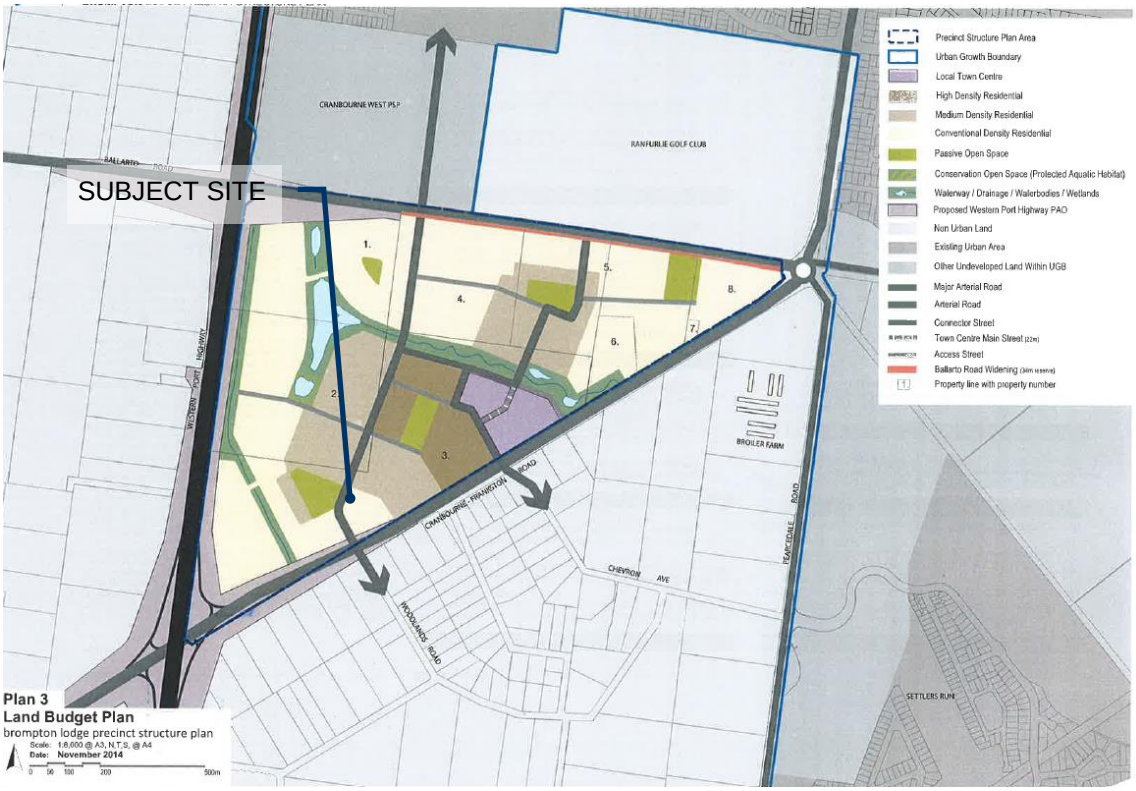
The MPA is responsible for the preparation of a Precinct Structure Plan for the Brompton Lodge Precinct (PSP 1209).

The PSP area in terms of major land uses and indicative road networks are shown in Figure 2-1. The indicative PSP shows two external road connections to each of Ballarto Road to the north and Cranbourne-Frankston Road to the south-east. No access will be provided to the Western Port Highway. Each of these four access points will ultimately be signalised.

The Brompton Lodge precinct has a total area of 106 hectares, which is expected to accommodate approximately 1,500 dwellings and 6,280m^2 of retail. A full buildout of the area is anticipated by 2030.

It is currently understood that ultimately there will be northern ramps to/from Ballarto Road at the Western Port Highway (Freeway), while there will be a full diamond interchange provided at the intersection of Cranbourne-Frankston Road.

Figure 2-1 Brompton Lodge PSP Area



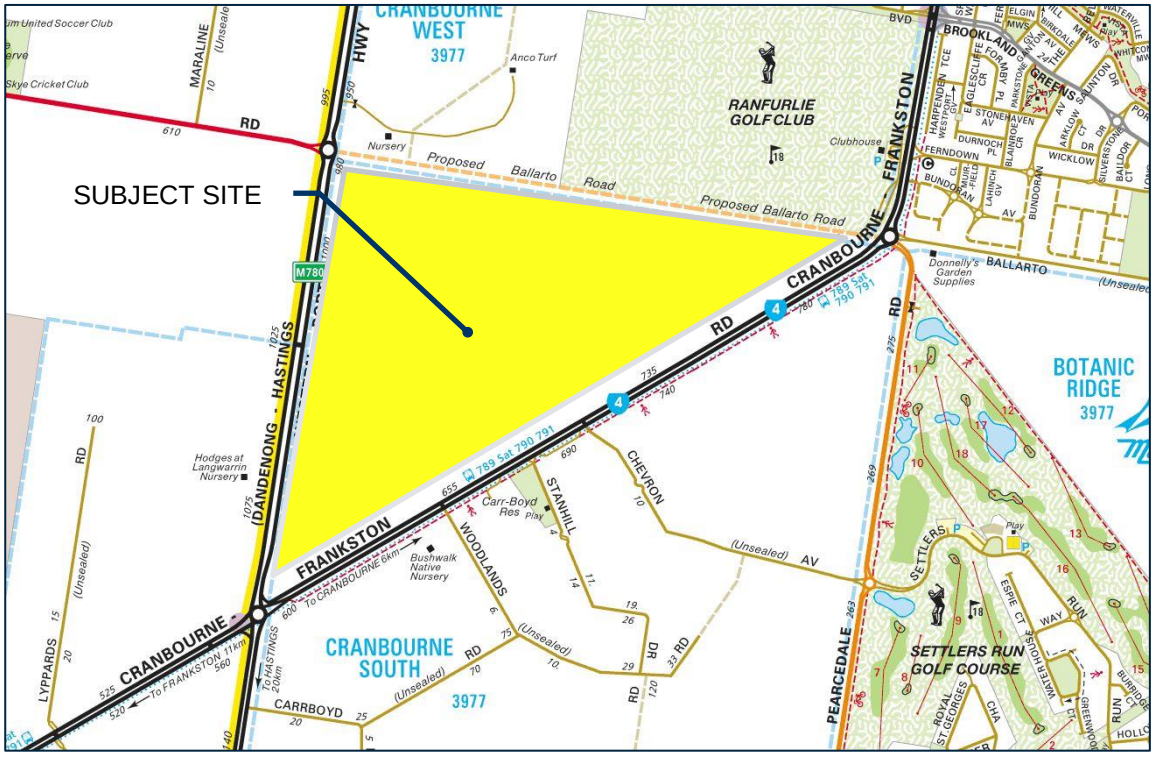
3 Road Network and PSP Access

3.1 Overall

The PSP area is triangular in shape and bounded by Western Port Highway to the west, Ballarto Road (future) to the north and the Cranbourne-Frankston Road to the south-east, as shown in Figure 3-1.

The current precinct is made up of farming land with some native vegetation. To the north of the site is the Ranfurnlie Golf Course and the Cranbourne West PSP area. To the south east are low density residential lots.

Figure 3-1 Brompton Lodge Existing Road Network

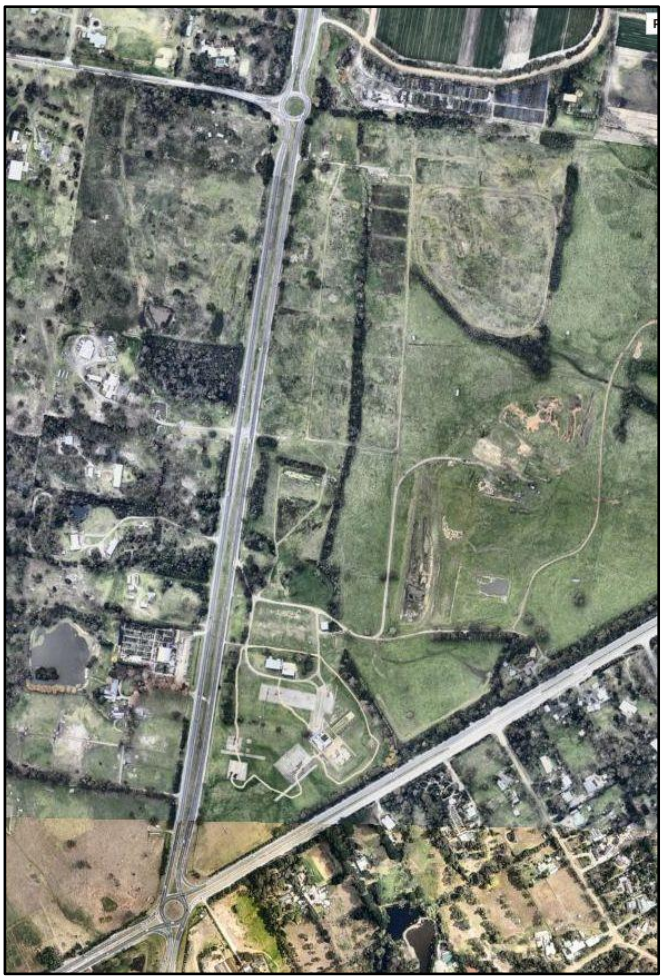


3.2 Western Port Highway

Western Port Highway is an arterial road that runs north-south between South Gippsland Highway and Frankston-Flinders Road.

West of Brompton Lodge, the Western Port Highway currently consists of a four lane duplicated carriageway, separated by a median, as shown in Figure 3-2. Roundabouts are currently formed with Cranbourne-Frankston Road (four-way) and Ballarto Road (three-way, no Ballarto Road eastern leg).

Figure 3-2 Western Port Highway, west of Brompton Lodge



The recent panel hearing in relation to Planning Scheme Amendment Casey C199, Frankston C99 and Greater Dandenong C183 recommended a Ballarto Road interchange to provide for northern ramps at Western Port Highway and VicRoads has adopted this position.

Ultimately a full diamond interchange is proposed at the junction of the Western Port Highway and Cranbourne-Frankston Road, noting that this intersection is outside of the Brompton Lodge PSP scope.

However, no definitive timeframe has been given with respect to the timing of the future upgrade of the Western Port Highway to Freeway standard.

3.3 Cranbourne - Frankston Road

Cranbourne-Frankston Road is an arterial road that general runs in an east-west direction between Monahans Road, Cranbourne and McClelland Drive, Frankston.

South-east of Brompton Lodge, the Cranbourne-Frankston Road currently consists of a four lane duplicated carriageway, separated by a median, as shown in Figure 3-3. Roundabouts are currently formed with Western Port Highway (four-way) and Ballarto Road/Pearcedale Road (five-way, minor Ballarto Road western leg).

Buses currently run along Cranbourne-Frankston Road at the site frontage, which are the only public transport facilities in the vicinity.

Figure 3-3 Cranbourne Frankston Road, south-east of Brompton Lodge

Access to the PSP area in the interim and ultimate period is to be provided via signalised cross intersections at both Woodlands Road and Chevron Avenue. Woodlands Road access at Cranbourne-Frankston Road is likely to be the major site access due to a heavy demand to use the Western Port Highway to head north, and the deletion of Ballarto Road as a potential access road to the Western Port Highway.

Modifications to the intersection of Cranbourne-Frankston Road / Ballarto Road / Pearcedale Road are required in the interim period as part of the PSP.

Cranbourne-Frankston Road is also proposed to be ultimately a 6 lane divided carriageway, with an additional lane being added in each direction.

3.4 Ballarto Road

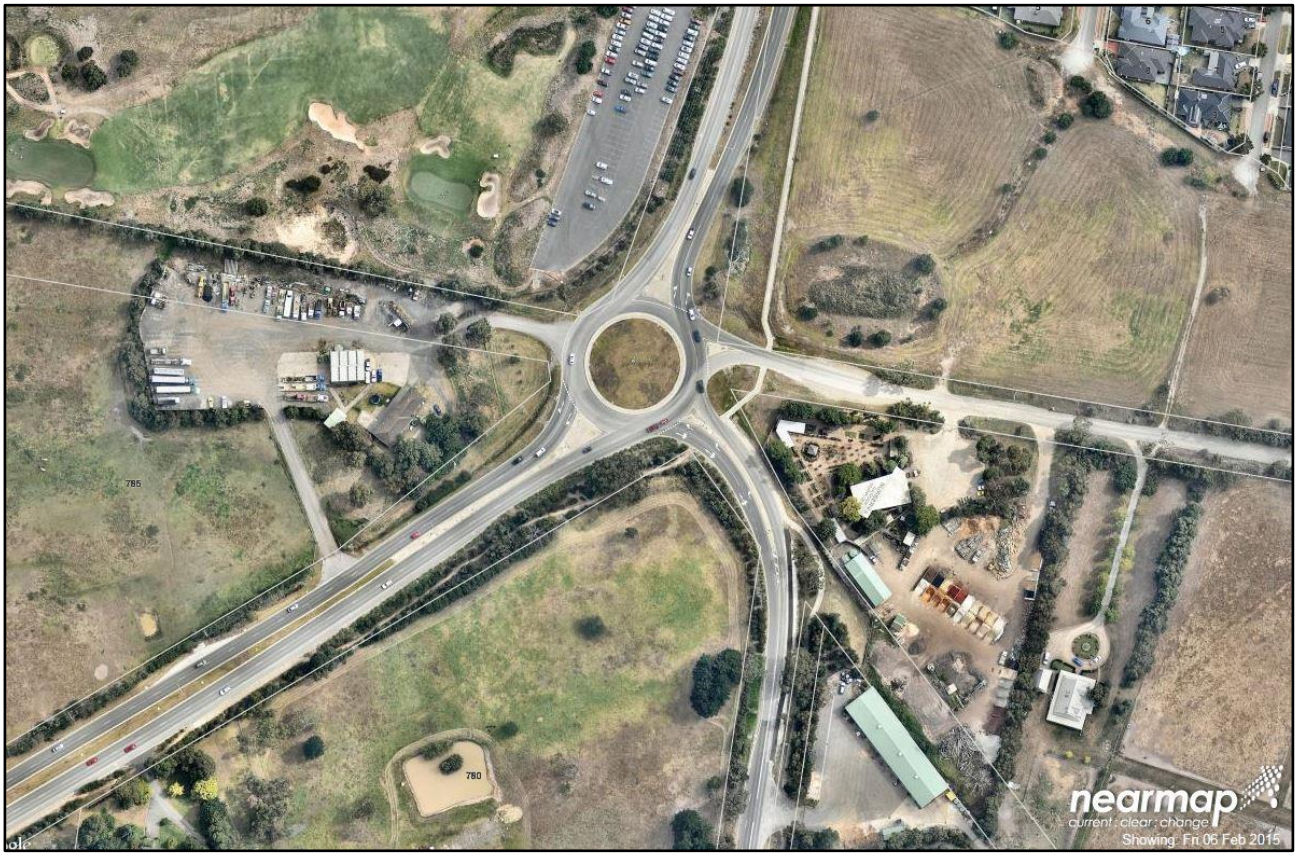
Ballarto Road is arterial road running east-west between Dandenong-Frankston Road and Western Port Highway. It forms a two-lane carriageway in this section. A further unsealed local road section of Ballarto Road runs from the Cranbourne-Frankston Road roundabout to the Cranbourne Royal Botanic Gardens.

A Ballarto Road extension connecting these two sections of Ballarto Road is ultimately proposed. The first section is to be provided via a two lane carriageway between the Woodlands Road extension and the Cranbourne-Frankston Road roundabout as part of the PSP area road works. The second road section between Woodlands Road and the Western Port Highway is to be delivered when the northern ramps at Ballarto Road to/from the Western Port Highway (Freeway) are constructed, which necessitates a four lane duplicated road between Western Port Highway and Cranbourne-Frankston Road. This road is to remain as a two-way/two-lane road until the Western Port Highway upgrade and Ballarto Road interchange are constructed.

In the interim period, the Ballarto Road carriageway will occupy the northern lanes of the ultimate design, allowing for one lane of traffic in each direction. No direct access to Ballarto Road is anticipated from lots within the Brompton Lodge PSP area, with access provided via controlled intersections at Woodlands Road extension (west) and Chevron Avenue extension (east).

Figure 3-4 Ballarto Road (west)/ Western Port Highway roundabout

Figure 3-5 Ballarto Road / Pearcedale Road / Cranbourne-Frankston Road



3.5 Woodlands Road

Woodlands Road is a local road that generally runs north-south between Cranbourne-Frankston Road and a dead-end east of Stanhill Drive. It is an unsealed single carriageway of approximately 5.5m. The current channelised intersection at Woodlands Road / Cranbourne-Frankston Road is shown in Figure 3-6.

Figure 3-6 Woodlands Road / Cranbourne-Frankston Road intersection

This intersection is to be signalised in the interim and ultimate scenarios for access to the Brompton Lodge PSP area.

3.6 Chevron Avenue

Chevron Avenue is a local road that generally runs east-west between Cranbourne-Frankston Road and Pearcedale Road. In the vicinity of Brompton Lodge, Chevron Avenue is a sealed single carriageway of approximately 7.0m width. The current channelised intersection at Chevron Avenue / Cranbourne-Frankston Road as shown in Figure 3-7.

Figure 3-7 Chevron Avenue / Cranbourne-Frankston Road intersection

3.7 Pearcedale Road

Pearcedale road is a major local road that runs north-south between Cranbourne-Frankston Road and Baxter-Tooradin Road, Pearcedale. In the vicinity of Brompton Lodge, Pearcedale road consists of a single two-lane carriageway.

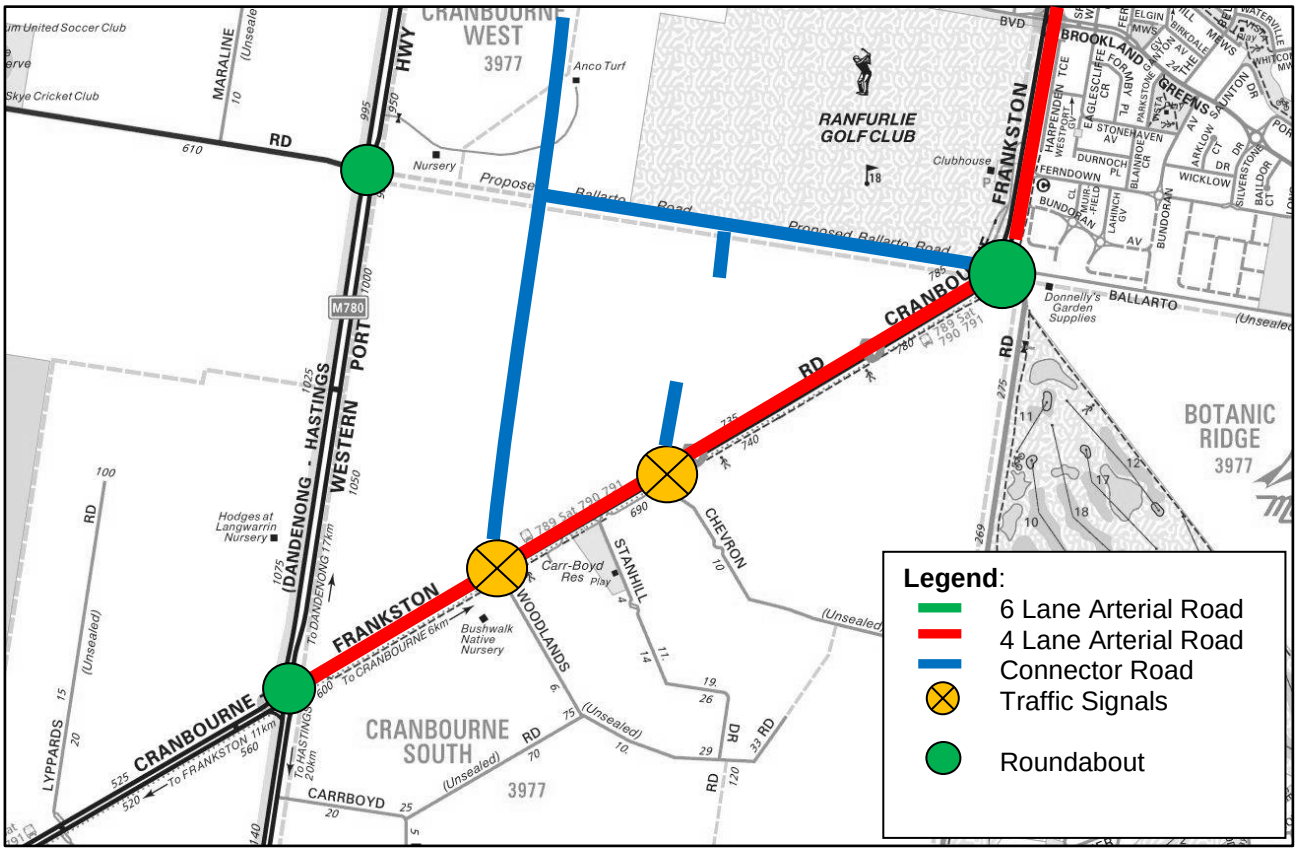
3.8 PSP Interim and Ultimate Road Network

Two scenarios for traffic generation have been considered, for the years 2026 and 2046 respectively. The 2026 volumes consider the road network as shown in Figure 3-8 and while the 2046 volumes consider the road network as shown in Figure 3-9.

3.8.1 Interim (2026)

Interim signals are provided at both the Woodlands and Chevron intersections with Cranbourne-Frankston Road to facilitate traffic movements into and out of the site. Unsignalised t-intersections will be sufficient to accommodate the traffic demands along Ballarto Road and its intersections with Woodlands Road and Chevron Avenue. No through traffic will access the Western Port Highway / Ballarto Road roundabout from the east (until a future interchange is constructed), due to existing capacity constraints and this intersection not being conducive to providing short term traffic solutions. Vehicles travelling north are likely to use the connector road through the Cranbourne West PSP area to the north or the existing, as well as the Cranbourne-Frankston Road /Western Port Highway roundabout.

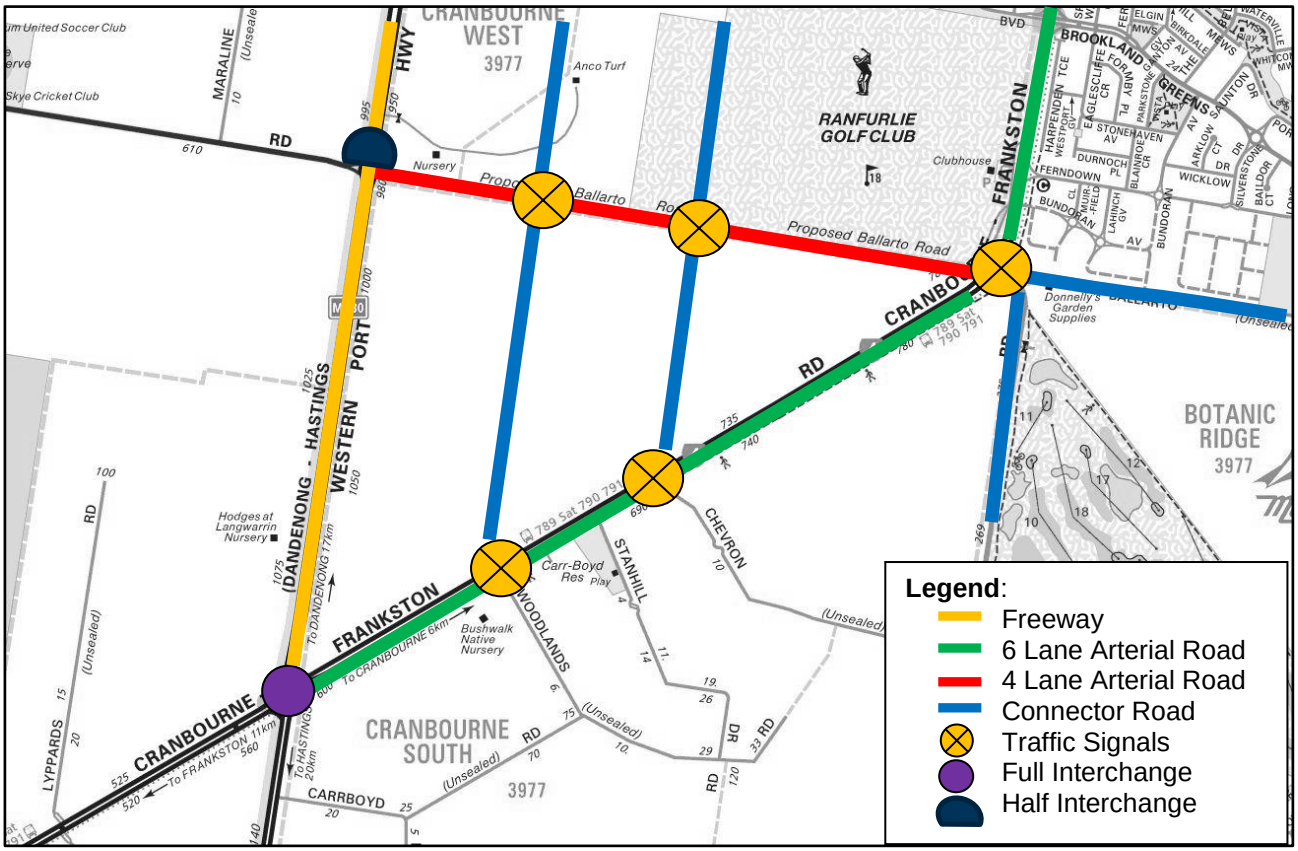
Figure 3-8 Interim Road Network



3.8.2 Ultimate (2046)

The road network is fully constructed with Ballarto Road a four lane arterial road cross section at the northern frontage and Cranbourne-Frankston Road being a six lane cross section on the south-east frontage. Signals are proposed at the Ballarto Road/Woodlands Road intersection and Ballarto Road / Eastern Connector intersection which also provide pedestrian connectivity to the Cranbourne West PSP. A Ballarto Road interchange provides for northern ramps at Western Port Highway, while a fully directional interchange is provided at Cranbourne-Frankston Road. Limited connectivity is required to the north for general traffic, however an allowance has been made for school and recreational traffic. Western Port Highway northbound traffic is split via the Ballarto Road interchange (65%) Cranbourne-Frankston Road interchange (30%), with small percentages through the Cranbourne West PSP site.

Figure 3-9 Ultimate Road Network



4 Traffic Considerations

4.1 Existing Volumes

In order to ascertain current conditions, turning movement counts were undertaken at various surrounding intersections of the PSP area on Wednesday 11th March 2015 between 7:00am and 9:30am, and between 4:00pm and 6:30pm. The AM and PM peak hour volumes are shown in Figure 4-1 to Figure 4-4

The specific intersections were:

- Western Port Highway / Ballarto Road
- Ballarto Road / Cranbourne-Frankston Road / Pearcedale Road
- Cranbourne-Frankston Road / Woodlands Avenue
- Cranbourne-Frankston Road / Chevron Avenue
- Western Port Highway / Browns Road
- Pearcedale Road / Browns Road

It is of note that not all intersection have peaks operating at identical times, however, for the purpose of conservative analysis, the current peaks are to be applied as though they occur concurrently. These volumes have been the basis of future volumes.

Figure 4-1 Existing Traffic Volumes – Western Port Highway / Ballarto Road

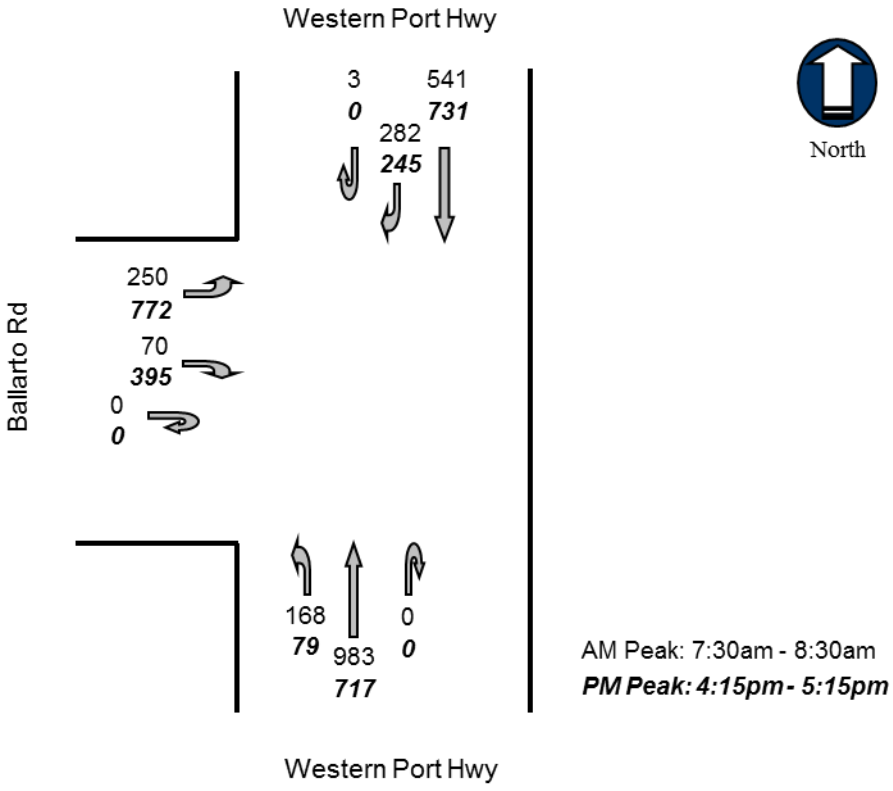


Figure 4-2 Existing Traffic Volumes – Cranbourne-Frankston Road/ Pearcedale Road / Ballarto Road

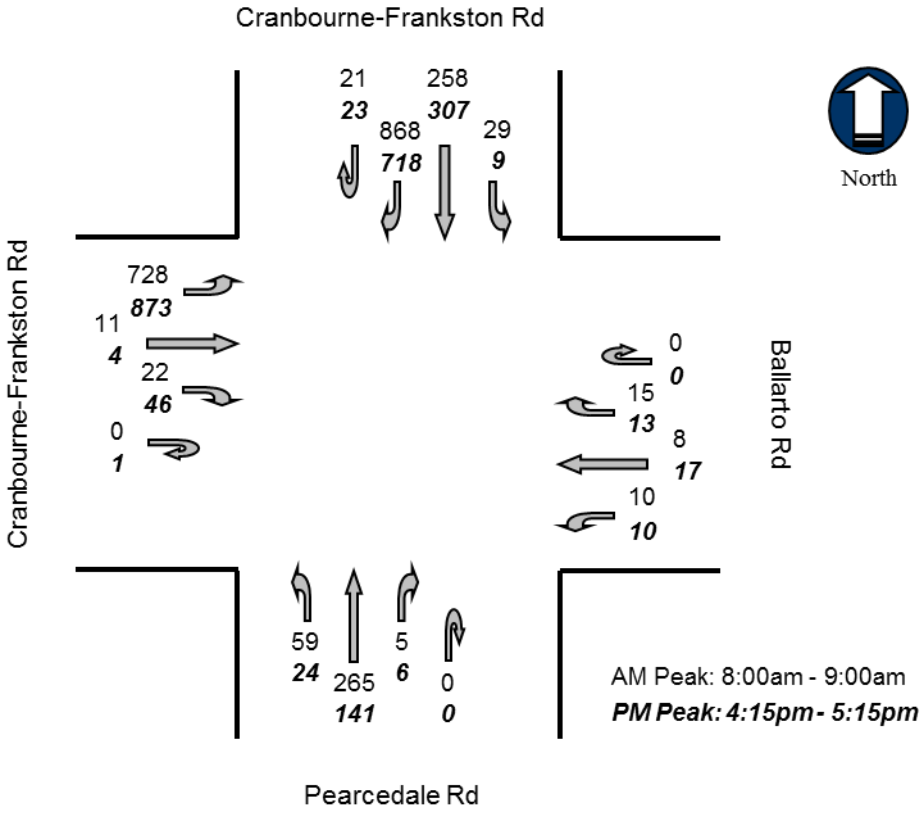


Figure 4-3 Existing Traffic Volumes – Cranbourne-Frankston Road/ Woodlands Avenue

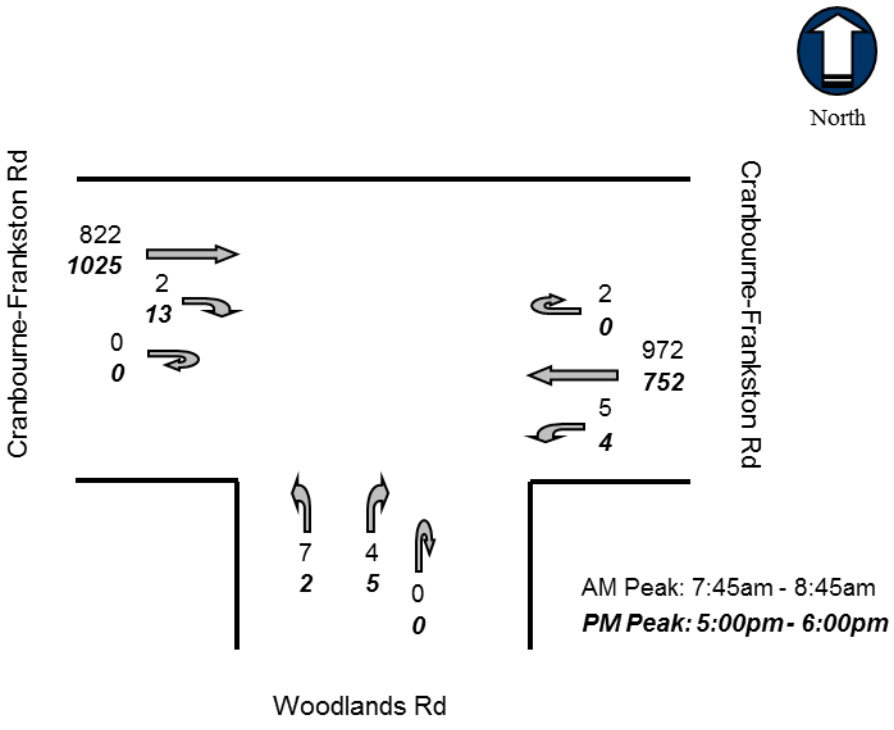
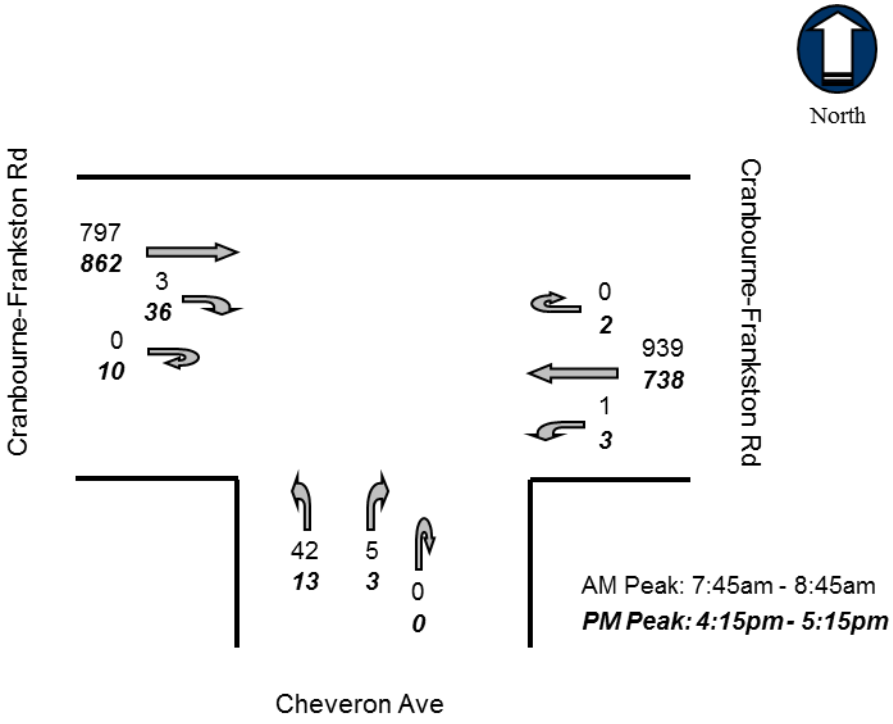


Figure 4-4 Existing Traffic Volumes – Cranbourne-Frankston Road/ Chevron Avenue



4.2 Future External Volumes

4.2.1 Interim

In the absence of precinct wide modelling, interim traffic volumes for 2026 have been considered by applying a growth factor of 5% per annum compounded over 11 years on surrounding roads. It is not expected that the Western Port Freeway will be operational at this time, nor there be a Ballarto Road connection to the Western Port Highway which would potentially redistribute traffic in the surrounding area. No through traffic on Ballarto Road has been considered at this stage, although Brompton Lodge traffic has been assigned here in the interim period.

Given a 5% compound volume growth over 11 years, a 71% increase on arterial and major local road traffic is modelled for 2026. On Cranbourne-Frankston Road, these volumes are of a similar order to the Ultimate 2046 volumes provided.

4.2.2 Ultimate

Ultimate 2046 volumes have been derived from the AECOM Updates to the VITM Strategic Model report (Option 2). The AECOM 2046 Option 2 volumes have been used for ultimate Ballarto Road (17,400vpd / 7,400vph) and Cranbourne-Frankston Road (26,300vpd / 2,630vph) through volumes. This option considers a full interchange with the Western Port Freeway at Cranbourne-Frankston Road and the northern ramps at Ballarto Road. Full diamond interchanges are anticipated at both Hall Road and Cranbourne-Frankston Road with the Western Port Highway. The directional split adopted is 45% Eastbound / 55% Westbound in AM and 55% Eastbound / 45% Westbound in PM, based on the existing volume split for Cranbourne-Frankston Road. Further to this, volumes are presented as “pcu” and include a heavy vehicle factor in their volumes.

These volumes feed into the Cranbourne-Frankston Road / Ballarto Road / Pearcedale Road intersection, using directional splits of the existing roundabout. Scaled up 2026 volumes have been applied for the following movements, as they are not present within the supplied 2046 volumes:

- Cranbourne-Frankston Road (north to south and north to east);

- Ballarto Road (east to north and east to south);
- Pearcedale Road (south to north and south to east).

4.3 PSP Traffic Generation

4.3.1 Dwellings

It is generally accepted that single dwelling lots in outer urban areas generate trips at a rate of up to 10 movements per day per lot.

In areas of good public transport accessibility, and for multi-unit and higher density dwelling lots, lower traffic generation rates are often observed. In this case, a conservative rate of 10 vehicle movements per lot has been adopted, with no discounts due to internal traffic movements due to a lack of facilities such as schools and parks.

4.3.2 Activity Centre

It has been assumed that the Activity Centre will generate traffic at a rate of 12.5 vehicle movements per peak hour. Given the size of the site, 25% of the traffic has been considered to be external.

4.3.3 Traffic Splits

The peak hour split of traffic for the two components, as shown in Table 4-1 and Table 4-2, has been adopted.

Table 4-1 Traffic Distribution Splits– Residential

Peak Period	Percentage of Daily	Outbound	Inbound
AM Peak Hour	10%	80%	20%
PM Peak Hour	10%	40%	60%

Table 4-2 Traffic Distribution Splits – NAC

Peak Period	Percentage of Daily	Outbound	Inbound
AM Peak Hour	10%	10%	90%
PM Peak Hour	10%	50%	50%

4.3.4 Combined Generations

In the interim period, 1000 lots in the western portion of the site (based around the Woodlands signalised access) and 100 lots on the eastern portion of the site as well as the Activity Centre (Chevron signalised access) have been assumed. This represents 11/15ths of the lot yield and assumes a linear lot yield of 100 per year between 2015 and 2030.

Considering the traffic generation rates and distributions detailed above, the expected traffic volumes generated by the proposed development are indicated in Table 4-3.

Table 4-3 Peak Hour Traffic Generation Interim – Vehicle Trips Per Hour

Peak Period	Total	Outbound	Inbound
AM Peak Hour	1350	905	445
PM Peak Hour	1350	565	785

In the ultimate scenario, the full build out of lots has been considered, adding a further 400 movements per peak hour, as shown in Table 4-4.

Table 4-4 Peak Hour Traffic Generation Ultimate – Vehicle Trips Per Hour

Peak Period	Total	Outbound	Inbound
AM Peak Hour	1750	1225	525
PM Peak Hour	1750	725	1025

4.4 Traffic Distribution

Considering the characteristics of the surrounding area, in particular the location of retail precincts, schools, employment zones and the arterial road network, the directional distribution shown in Table 4-5 has been adopted. This distribution is consistent with a previous report prepared by Traffix Group for the landowners of the Brompton Lodge site. There is a high proportion of vehicles heading to the north due to the services, facilities and employment areas being located in that direction, with further traffic distributed to Frankston and Cranbourne to the west and east respectively.

Table 4-5 Directional Traffic Distribution

Direction	Percentage
Western Port Highway – North	50%
Ballarto Road - West	3%
Cranbourne-Frankston Road – South West	17%
Western Port Highway – South	4%
Pearcedale Road - South	1%
Cranbourne-Frankston Road – North	20%
Ballarto Road - East	5%

It is noted that this traffic distribution relates to the residential component only. It is likely that activity centre traffic will include a component of passing traffic which is not allowed for within modelling of the entire precinct. Additional volumes should therefore be applied to and from the NAC area from Cranbourne-Frankston Road.

4.5 Anticipated Volumes PSP (Traffic Generation Output)

Based on the surveys of the existing traffic volumes for key intersections, traffic modelling for 2046 undertaken by AECOM and a first principles assessment for the development traffic generation and distribution as described above, a full traffic model has been developed for the road network in both the interim (2026) and ultimate (2046) scenarios.

The following outputs are attached in Appendix A for the full road network:

- 2026 AM and PM Brompton Lodge generated volumes
- 2026 AM and PM full network traffic volumes
- 2046 AM and PM Brompton Lodge generated volumes
- 2046 AM and PM full network traffic volumes

Excerpts of the surrounding road network are shown in Figure 4-5 to Figure 4-10

It is of note that Western Port Highway / Cranbourne-Frankston Road volumes (Intersection 5) in 2026 and 2046 represent Brompton Lodge movements only as no existing volume survey was undertaken.

It is also of note that Intersections 4 and 8 are the same intersection (Cranbourne-Frankston Road / Ballarto Road / Pearcedale Road), with intersection 4 relating to the turning movements into and out of the new Ballarto Road section of the complex intersection to separate this leg from the surrounding growth factors.

4.5.1 General Comments

Given the high volumes (interim 675 vehicles, ultimate 875 vehicles) projected to be heading to/from the Western Port Highway- North from/to the Brompton Lodge area, particular attention is required to be paid to the volumes heading along this route. As there is no Ballarto Road access to the Western Port Highway, two alternative routes are available.

In the 2026 AM peak, a volume of 380vph is projected to turn right from Woodlands Road into Cranbourne-Frankston Road, with 231vph turning right from Cranbourne-Frankston Road into Western Port Highway. A further 228vph one-way and 285vph two-way are projected to head through the Cranbourne West PSP area.

Exiting at the Woodlands Road / Cranbourne-Frankston Road intersection will require double right turn lanes out (north to west) due to heavy right turning volumes.

With no Ballarto Road access to the Western Port Highway, and therefore limited through traffic, a T intersection would be required in the Interim 2026 period at the Woodlands Road / Ballarto Road intersection.

Figure 4-5 2026 Interim Volumes AM

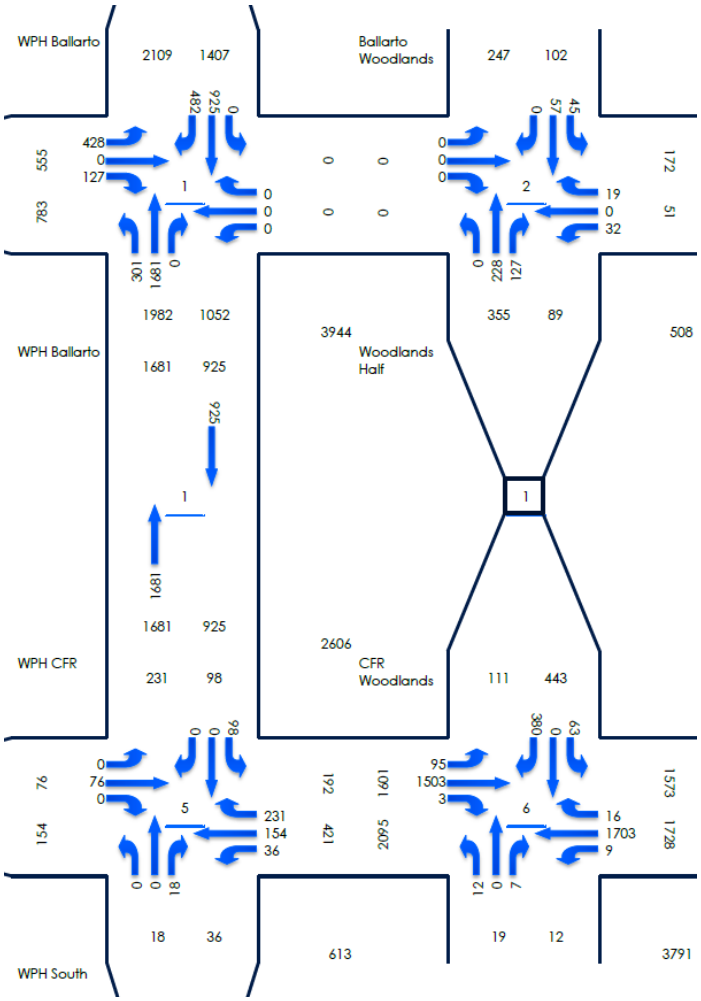


Figure 4-6 2026 Interim Volumes PM

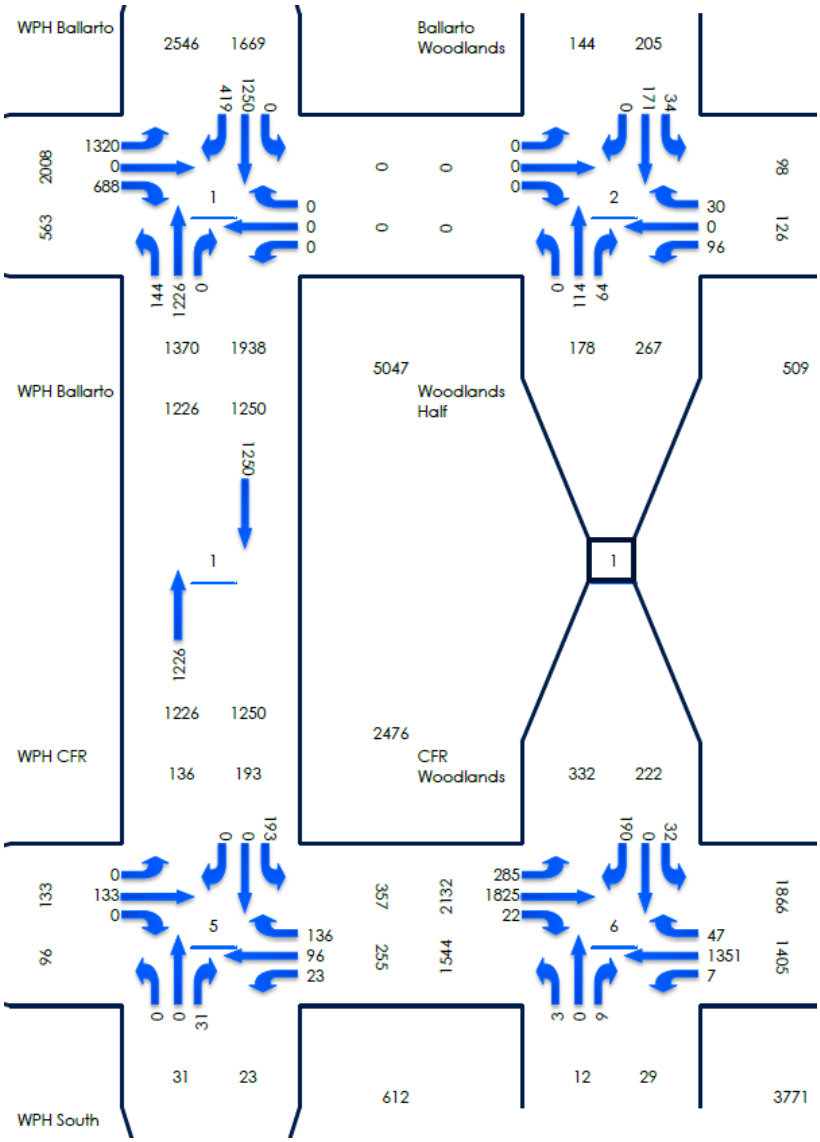


Figure 4-7 2046 Ultimate AM Volumes – Woodlands Half

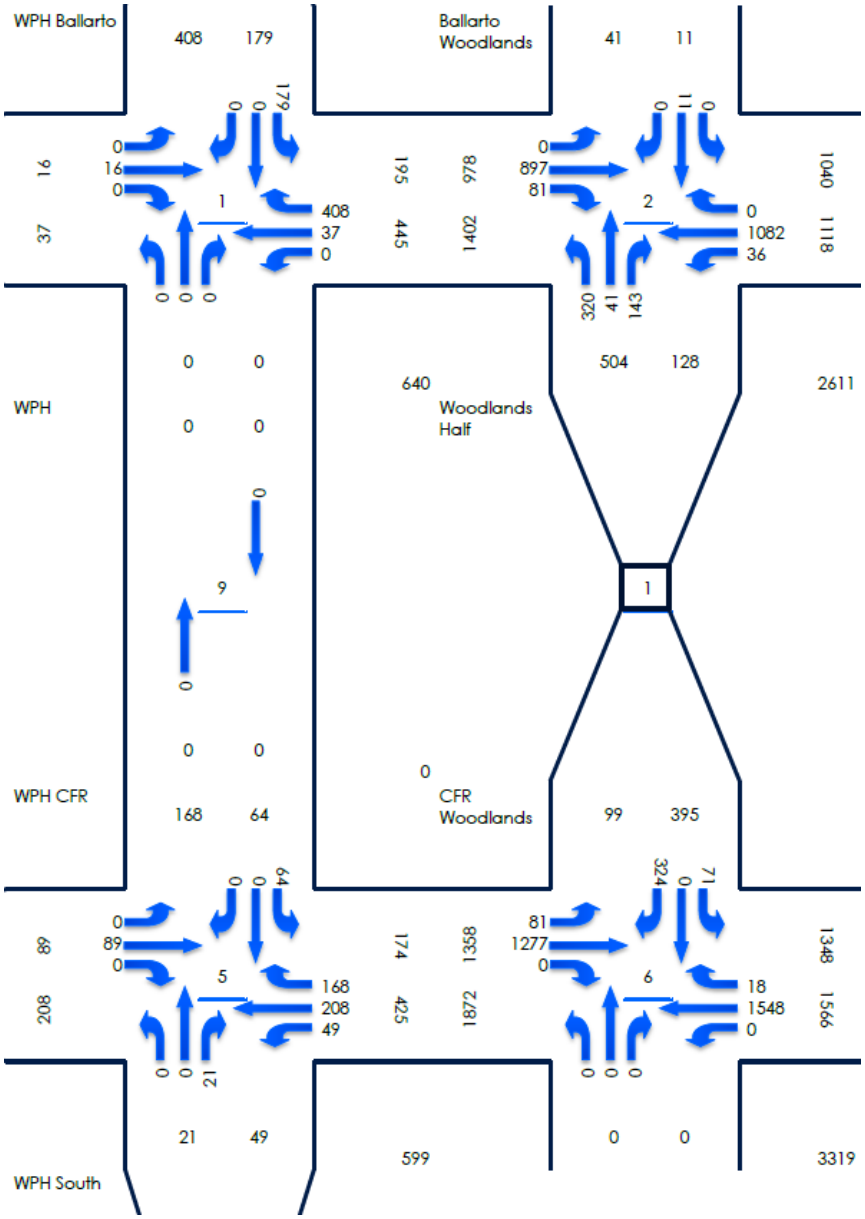


Figure 4-8 2046 Ultimate AM Volumes – Chevron Half

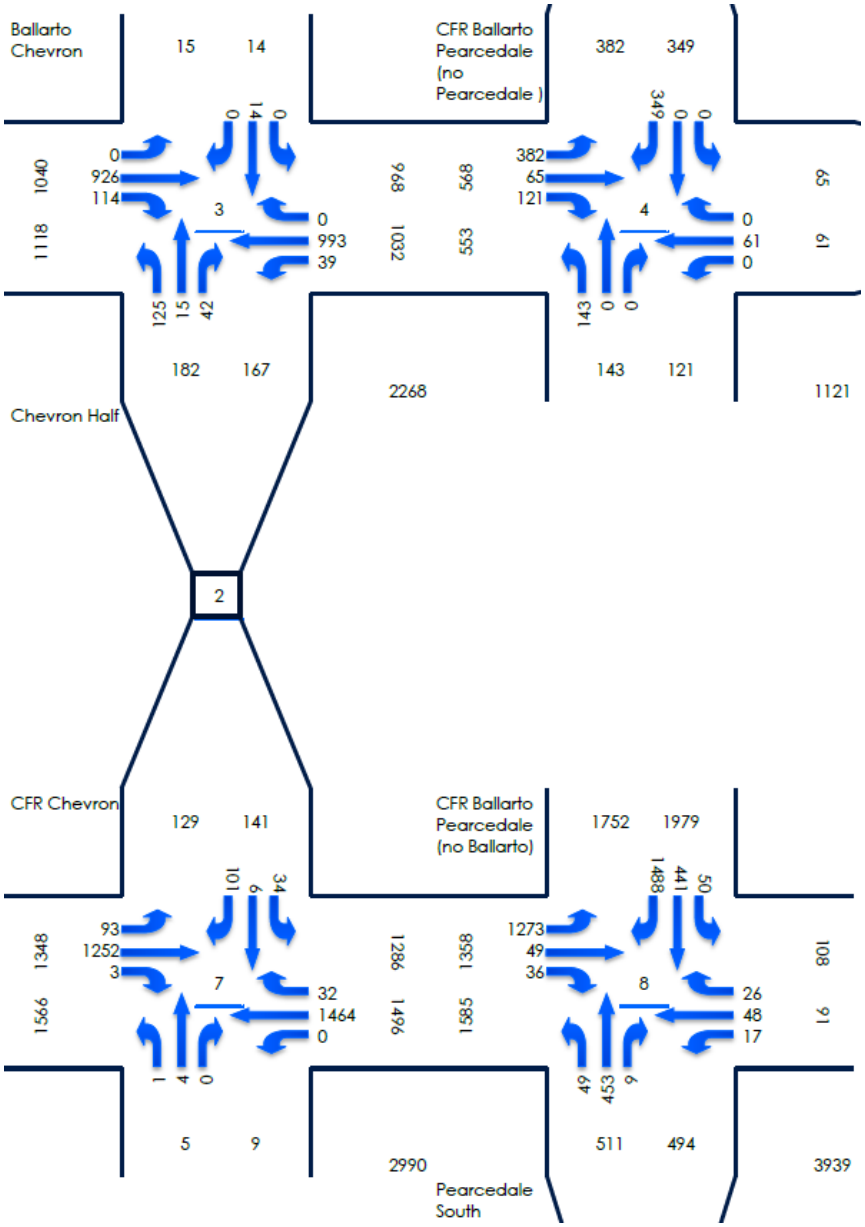


Figure 4-9 2046 Ultimate PM Volumes – Woodlands Half

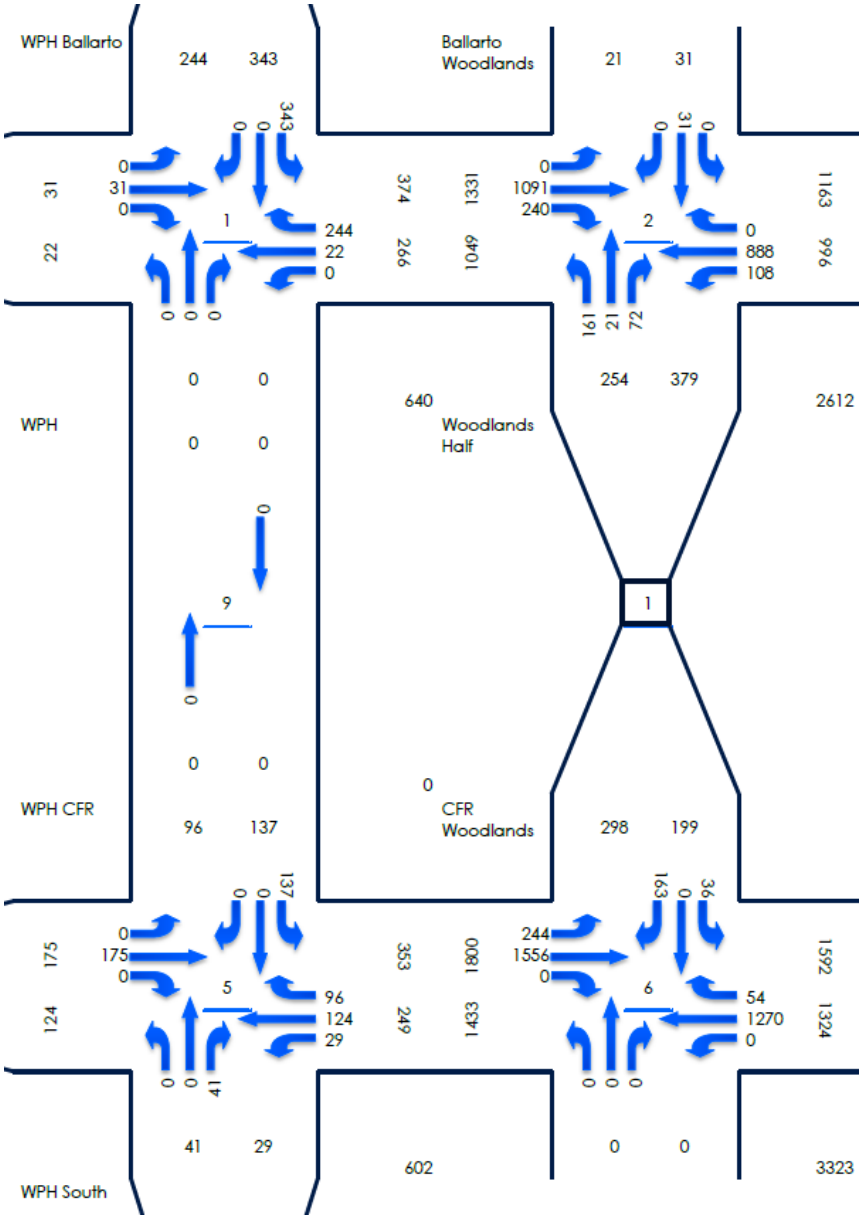
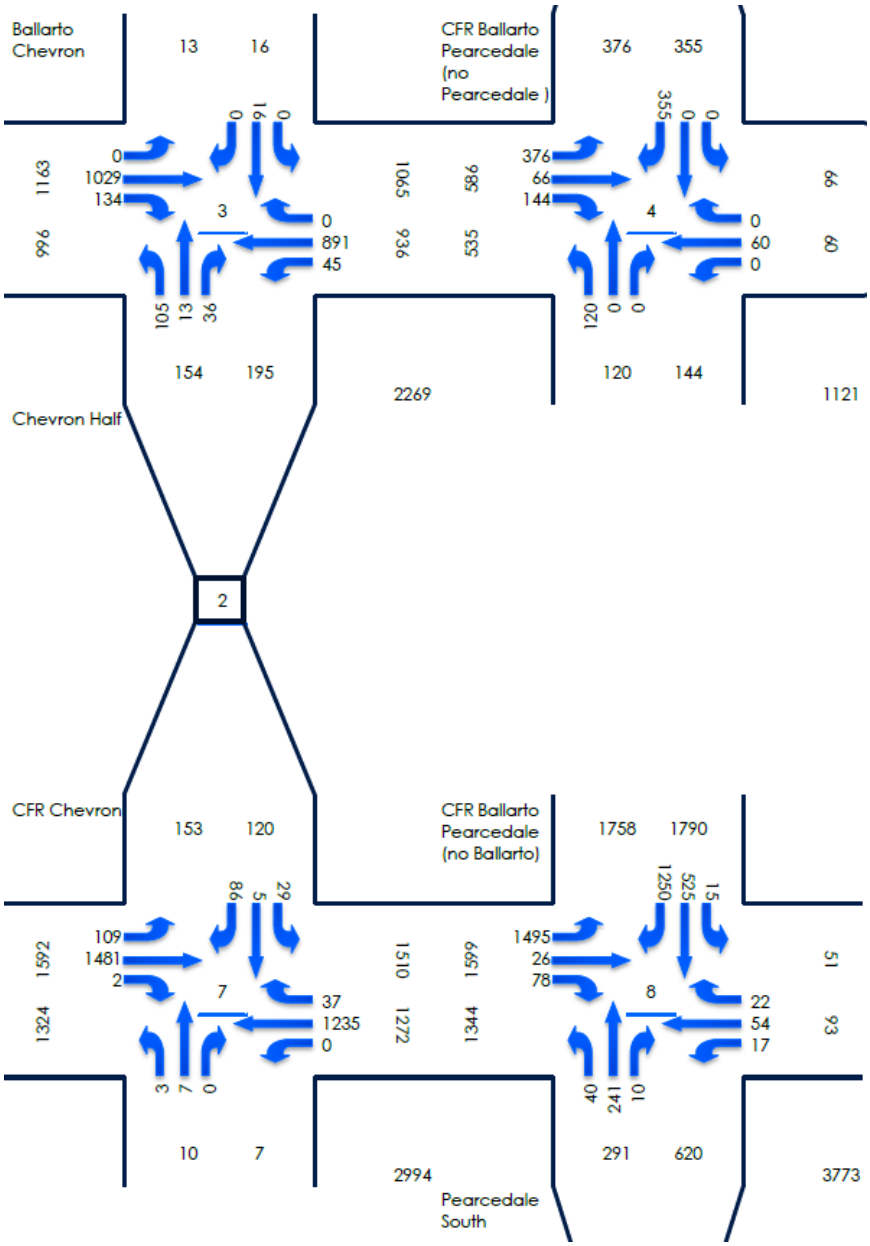


Figure 4-10 2046 Ultimate PM Volumes – Chevron Half



5 Intersection and Road Concept Designs

The intersection concepts for the roads abutting the Brompton Lodge area are shown in Appendix B with discussion provided below.

5.1 Ballarto Road / Woodlands Road

In the interim period, with no connection to the western side of Ballarto Road, this intersection would operate as a "Give Way" controlled T intersection, with priority to north-south movements. Sidra analysis of this intersection shows no significant queuing or delays in the interim period.

In the ultimate scenario, a signalised intersection is proposed to control the movements associated with access to and from the Western Port Highway via Ballarto Road and to facilitate pedestrian movements between the Brompton Lodge PSP area and the Cranbourne West PSP area. Sufficient land has been allocated to construct this intersection when the duplication of Ballarto Road occurs.

5.2 Ballarto Road / Eastern Connector

In the interim period, with no connection to the western side of Ballarto Road, nor to the Ranfurlie Golf Club to the north, this intersection would operate as a "Give Way" controlled T intersection, with priority to east-west movements. Sidra analysis of this intersection shows no significant queuing or delays in the interim.

In the ultimate scenario, a signalised intersection is proposed, to control the movements associated with access to and from Ballarto Road and to facilitate pedestrian movements between the Brompton Lodge PSP area and the Cranbourne West PSP area. Sufficient land has been allocated to construct this intersection when the duplication of Ballarto Road occurs.

5.3 Cranbourne- Frankston Road / Woodlands Road

5.3.1 Interim Layout

In the interim period, Cranbourne-Frankston Road will contain two through lanes in each direction. Due to the high turning movements into and out of Woodlands Road in the interim period, a double right turn out is required, as well as a left turn slip lane to accommodate this demand.

5.3.2 Ultimate Layout

In the ultimate period, Cranbourne-Frankston Road will contain three through lanes in each direction. The on-road bicycle lanes are converted to off road in this scenario. The alignment of Woodlands Road does not change from the interim scenario.

5.4 Cranbourne- Frankston Road / Chevron Avenue

5.4.1 Interim Layout

In the interim period, Cranbourne-Frankston Road will contain two through lanes in each direction. Due to the lower turning movements into and out of Chevron Avenue compared to Woodlands road in the interim period, a single right turn out is satisfactory, with no left turn slip lane.

Note: Additional interim and ultimate turning volumes were added to the NAC access Sidra Analysis at Chevron Avenue / Cranbourne-Frankston Road to account for diverted traffic from Cranbourne-Frankston Road.

5.4.2 Ultimate Layout

In the ultimate period, Cranbourne-Frankston Road will contain three through lanes in each direction. The on-road bicycle lanes are converted to off-road in this scenario. The alignment of Chevron Avenue does not change from the interim scenario.

5.5 Cranbourne-Frankston Road / Pearcedale Road / Ballarto Road

Based on discussions with VicRoads, the interim treatment for the intersection of Cranbourne-Frankston Road / Pearcedale Road / Ballarto Road was agreed to be retained as a roundabout, however, the western approach to Ballarto Road is to be added. Sidra analysis of the existing traffic volumes, superimposed with interim Brompton Lodge traffic showed the interim roundabout operating at acceptable levels.

Ultimately, the roundabout is proposed to be a signalised intersection, with the implication of the signalised intersection upon the Brompton Lodge PSP area being that a small section of land is required at the north-eastern tip of the site.

5.6 Intersection Analysis

To assist with the design the intersections, the operation of all intersections within the project scope were analysed using SIDRA Intersection, for both the Interim and Ultimate traffic volume scenarios.

The results of the SIDRA Intersection analysis are summarised in Table 5-1 and Table 5-2, with full results in Appendix C.

Table 5-1 SIDRA Intersection Analysis Summary - Interim

	Intersection	Degree of Saturation
AM Peak	Ballarto Road / Woodlands Road	0.23
	Ballarto Road / Eastern Connector	0.11
	CFR / Woodlands Road	0.86
	CFR / Chevron Avenue	0.87
	CFR / Ballarto / Pearcedale	0.66
PM Peak	Ballarto Road / Woodlands Road	0.17
	Ballarto Road / Eastern Connector	0.14
	CFR / Woodlands Road	0.85
	CFR / Chevron Avenue	0.84
	CFR / Ballarto / Pearcedale	0.59

Table 5-2 SIDRA Intersection Analysis Summary - Ultimate

	Intersection	Degree of Saturation
AM Peak	Ballarto Road / Woodlands Road	0.85
	Ballarto Road / Eastern Connector	0.78
	CFR / Woodlands Road	0.88
	CFR / Chevron Avenue	0.83
PM Peak	Ballarto Road / Woodlands Road	0.76
	Ballarto Road / Eastern Connector	0.70
	CFR / Woodlands Road	0.89
	CFR / Chevron Avenue	0.84

6 Costings

Detailed civil costings have been prepared for the interim signalised intersection and roundabout treatments, as well as the construction of the interim two-lane/ two-way carriageway along Ballarto Road. These costings are based on the intersection designs described in Section 5. Detailed risk-based estimates are provided within Appendix D, with a summary of the costings shown in Table 6-1.

Table 6-1 Interim Treatment Costings

Interim Intersection/Road Treatments	Project Budget (75% confidence)
Ballarto Road (RD-01)	$4,222,870.33
Cranbourne-Frankston Road / Woodlands Road Signals (IN-03)	$3,880,045.85
Cranbourne-Frankston Road / Chevron Avenue Signals (IN-04)	$2,734,934.35
Cranbourne-Frankston Road / Ballarto Road / Pearcedale Road Roundabout (IN-05)	$950,798.78
Total Cost	**$11,788,649.30**

7 Conclusions

Based on the foregoing analysis it is concluded that;

> The traffic demands of the PSP area are in the order of 17,500 vpd, with 1,750 vph to occur in each of the peaks;

> The interim and ultimate intersection layouts included in this report are suitable to provide for access to the future Brompton Lodge PSP area traffic movements.

> The interim and ultimate designs provide for sufficient land to be allocated to road and intersection projects along Ballarto Road and Cranbourne-Frankston Road.

APPENDIX A

PROJECTED TRAFFIC VOLUMES

Cardno
Shaping the Future

Gen

(v1.5): 27-May-13

CG150179

#N/A

Network Plan View

Options	
Roundup	Yes
Show Totals	Yes

Show Precincts	
Woodlands Half	Yes
Chevron Half	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes

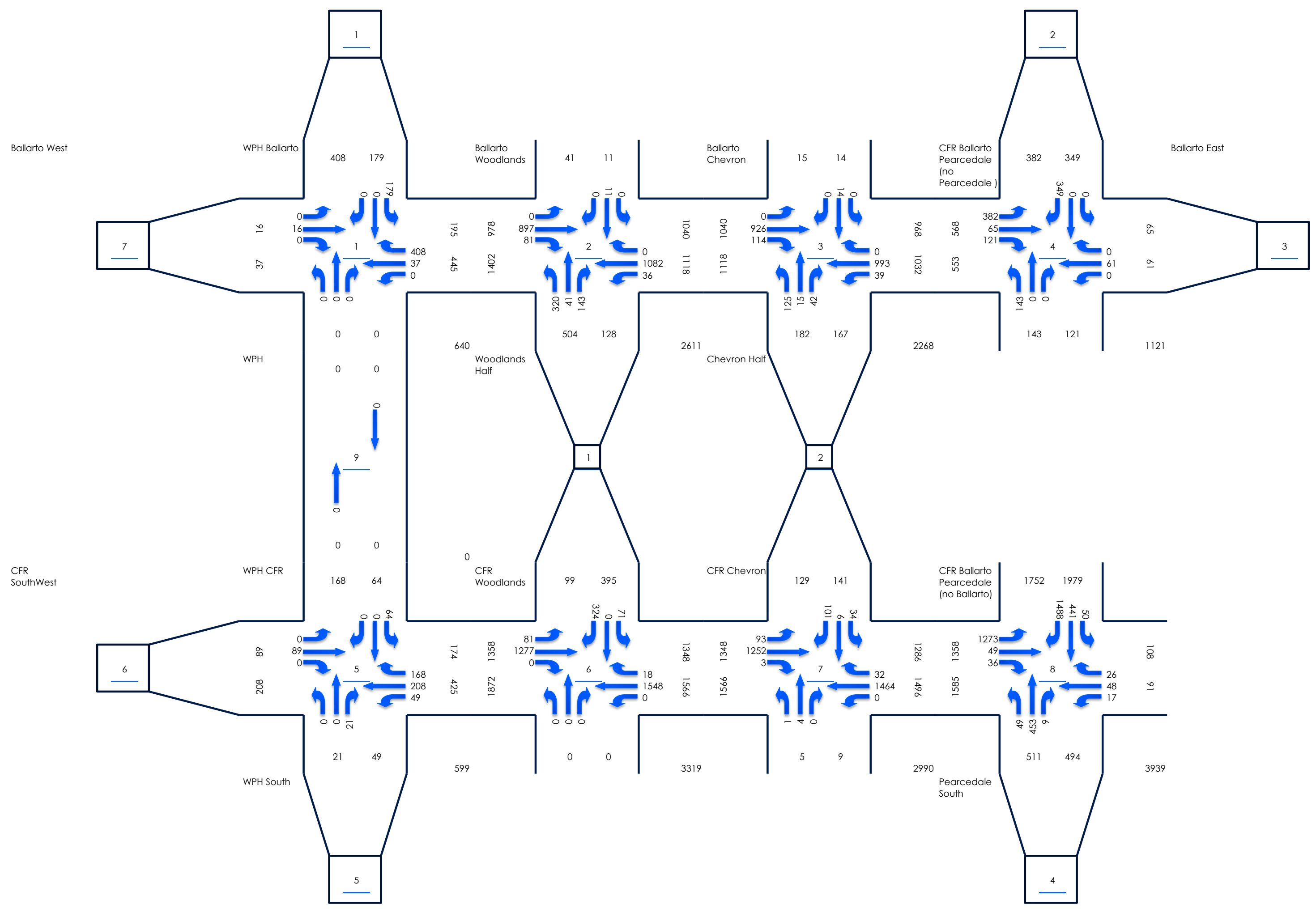
View
AM Peak Volumes
Future Volumes

Vehicle Type
Total Vehicles

Growth of Existing Volumes	
Apply Growth	No
AM	5.0%
PM	5.0%
Daily	5.0%
Growth Type	Comp.
Number of Years	10
Effective AM Growth	0.0%
Effective PM Growth	0.0%
Effective Daily Growth	0.0%

Adopted Peak Hour	
Use Individual Peak Times	
Combined AM Peak	12:00 AM
Combined PM Peak	12:00 PM
Custom AM Peak Start	7:30 AM
Custom PM Peak Start	4:30 PM
Adopted AM Peak	Varies
Adopted PM Peak	Varies

Route Test & Distributions	
Chevron Half	
WPH North	
A	
Inbound Route	70.0%
Outbound Route	70.0%
Show Route Test	Yes
Residential	
AM	
Show Distributions	Yes



Gen

(v1.5): 27-May-13

CG150179

#N/A

Network Plan View

Options	
Roundup	Yes
Show Totals	Yes

Show Precincts	
Woodlands Half	Yes
Chevron Half	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes

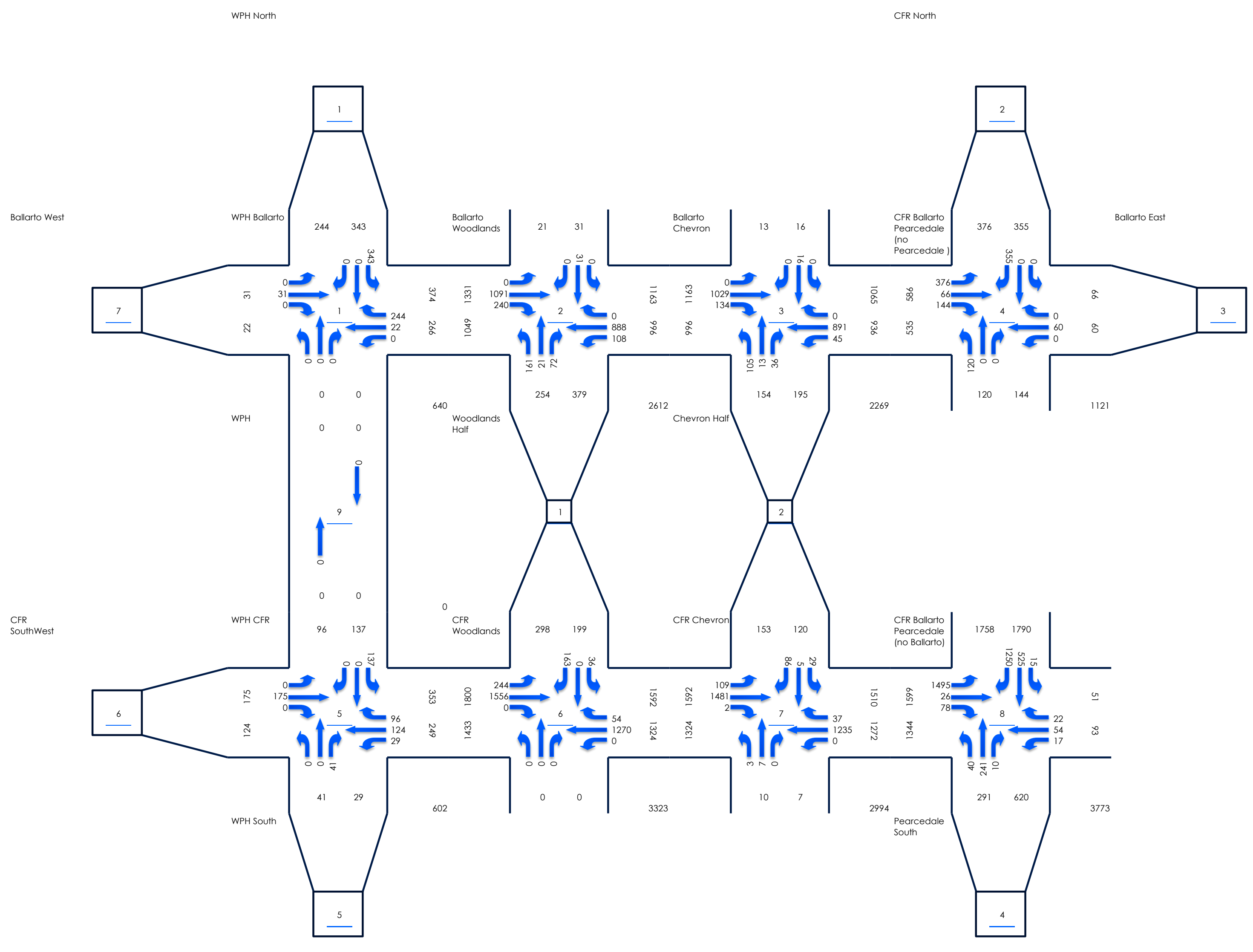
View
PM Peak Volumes
Future Volumes

Vehicle Type
Total Vehicles

Growth of Existing Volumes	
Apply Growth	No
AM	5.0%
PM	5.0%
Daily	5.0%
Growth Type	Comp.
Number of Years	10
Effective AM Growth	0.0%
Effective PM Growth	0.0%
Effective Daily Growth	0.0%

Adopted Peak Hour	
Use Individual Peak Times	
Combined AM Peak	12:00 AM
Combined PM Peak	12:00 PM
Custom AM Peak Start	7:30 AM
Custom PM Peak Start	4:30 PM
Adopted AM Peak	Varies
Adopted PM Peak	Varies

Route Test & Distributions	
Chevron Half	
WPH North	
A	
Inbound Route	70.0%
Outbound Route	70.0%
Show Route Test	Yes
Residential	
AM	
Show Distributions	Yes



Gen

(v1.5): 27-May-13

CG150179

Brompton Lodge Psp

Network Plan View

Options	
Roundup	Yes
Show Totals	Yes

Show Precincts	
Woodlands Half	Yes
Chevron Half	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes

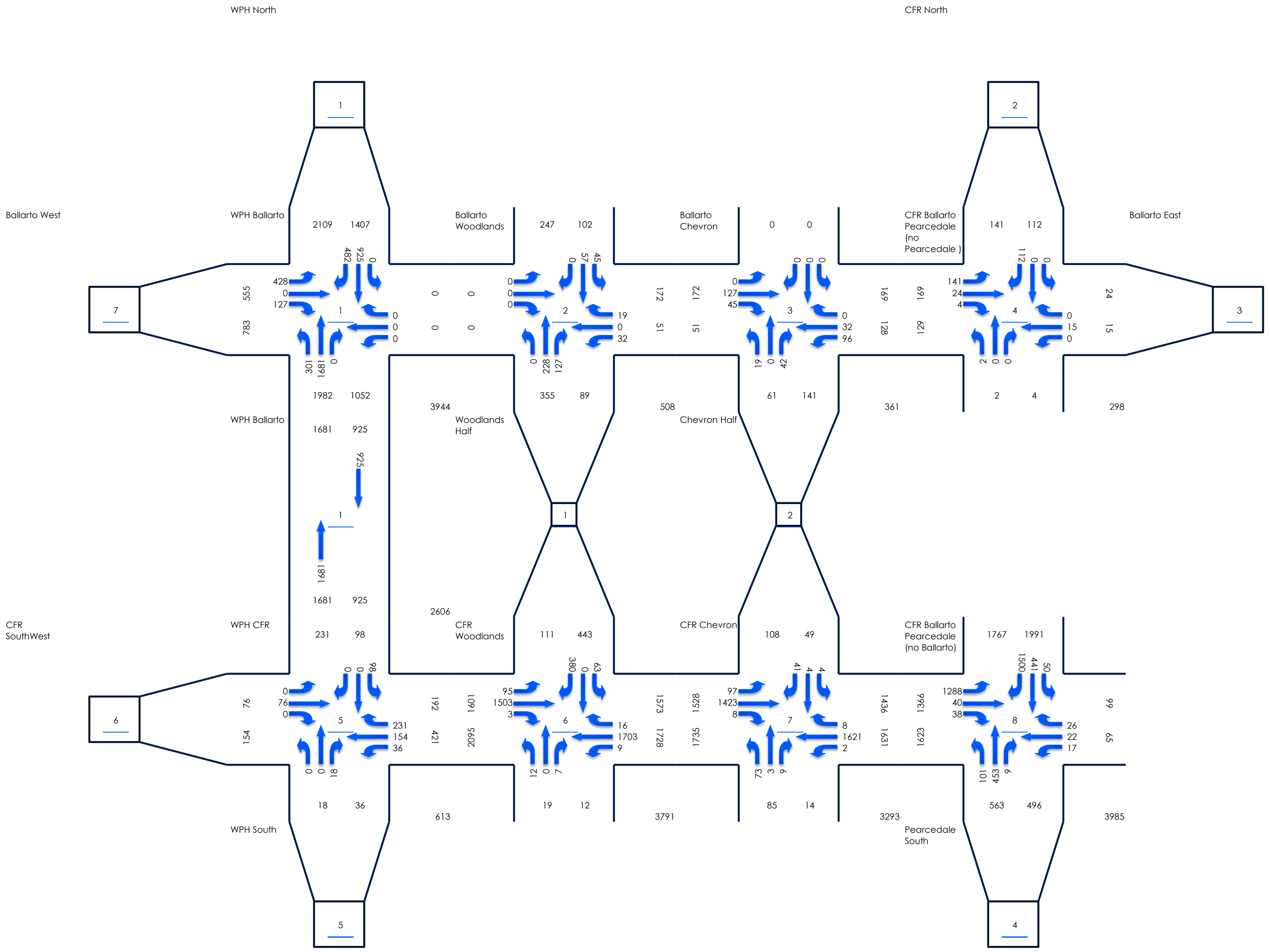
View
AM Peak Volumes
Future Volumes

Vehicle Type
Total Vehicles

Growth of Existing Volumes	
Apply Growth	Yes
AM	5.0%
PM	5.0%
Daily	5.0%
Growth Type	Comp.
Number of Years	11
Effective AM Growth	71.0%
Effective PM Growth	71.0%
Effective Daily Growth	71.0%

Adopted Peak Hour	
Use Individual Peak Times	
Combined AM Peak	12:00 AM
Combined PM Peak	12:00 PM
Custom AM Peak Start	7:30 AM
Custom PM Peak Start	4:30 PM
Adopted AM Peak	Varies
Adopted PM Peak	Varies

Route Test & Distributions	
Woodlands Half	
WPH North	
A	
Inbound Route	0.0%
Outbound Route	0.0%
Show Route Test	Yes
Residential	
AM	
Show Distributions	Yes



Gen

(v1.5): 27-May-13

CG150179

Brompton Lodge Psp

Network Plan View

Options	
Roundup	Yes
Show Totals	Yes

Show Precincts	
Woodlands Half	Yes
Chevron Half	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes

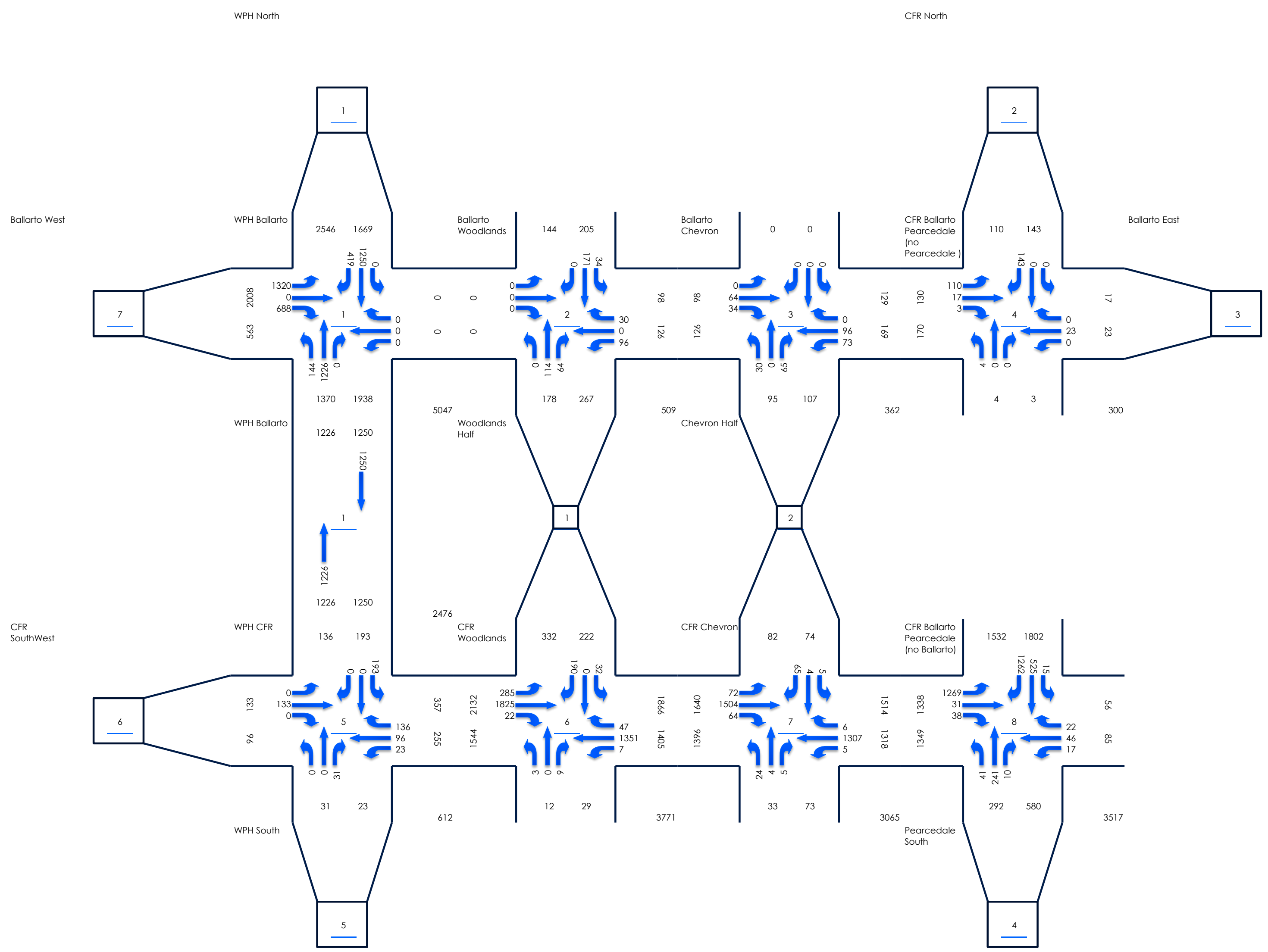
View
PM Peak Volumes
Future Volumes

Vehicle Type
Total Vehicles

Growth of Existing Volumes	
Apply Growth	Yes
AM	5.0%
PM	5.0%
Daily	5.0%
Growth Type	Comp.
Number of Years	11
Effective AM Growth	71.0%
Effective PM Growth	71.0%
Effective Daily Growth	71.0%

Adopted Peak Hour	
Use Individual Peak Times	
Combined AM Peak	12:00 AM
Combined PM Peak	12:00 PM
Custom AM Peak Start	7:30 AM
Custom PM Peak Start	4:30 PM
Adopted AM Peak	Varies
Adopted PM Peak	Varies

Route Test & Distributions	
Woodlands Half	
WPH North	
A	
Inbound Route	0.0%
Outbound Route	0.0%
Show Route Test	Yes
Residential	
AM	
Show Distributions	Yes



Brompton Lodge PSP

APPENDIX B

CONCEPT INTERSECTION DESIGNS

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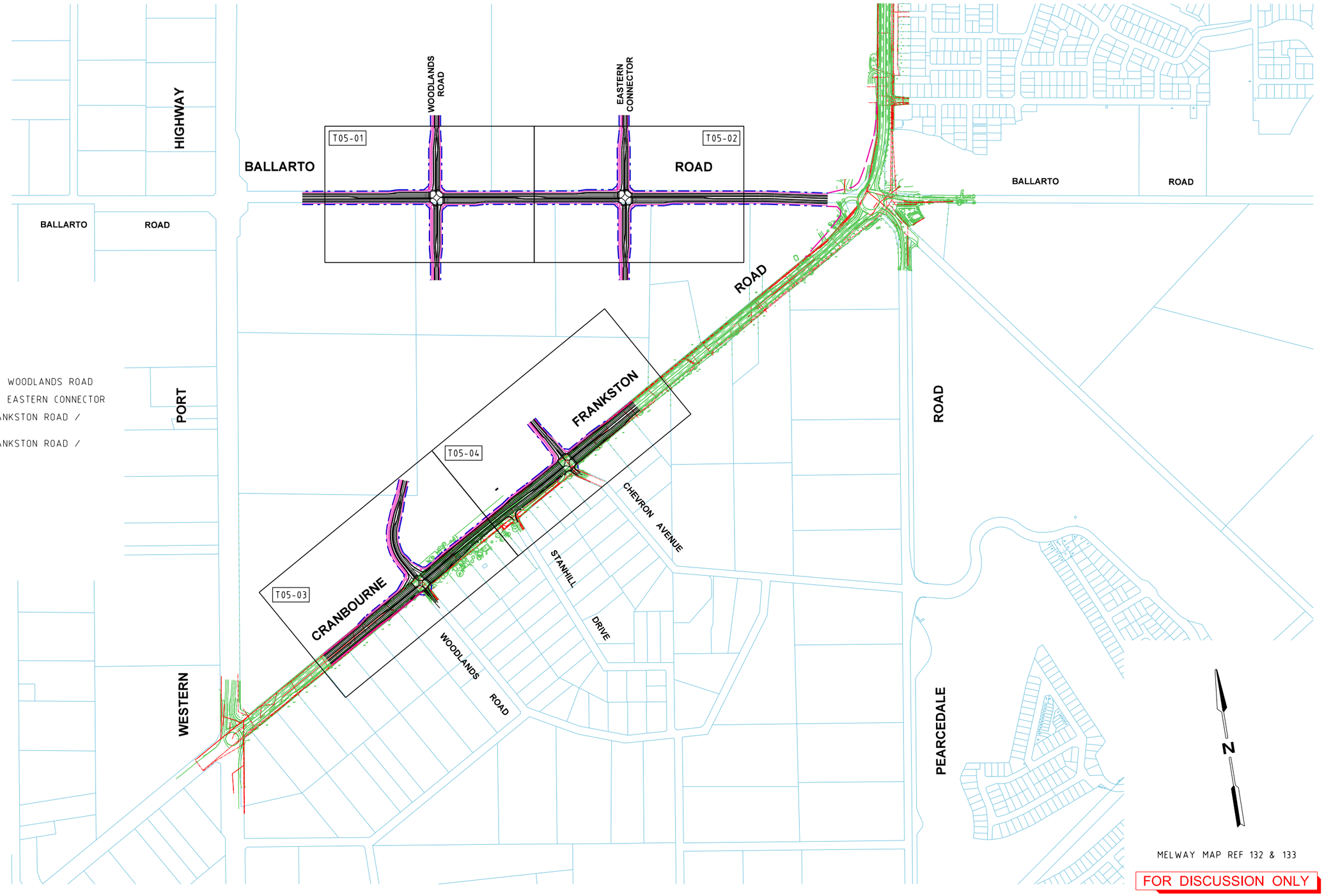
Shaping the Future

DATE PLOTTED: 12/10/2015 5:07:49 PM BY: andrew.yiannoudes

BROMPTON LODGE PSP
ULTIMATE INTERSECTION DESIGN



DRAWING LIST

CG150179-T05-00	COVER SHEET
CG150179-T05-01	BALLARTO ROAD / WOODLANDS ROAD
CG150179-T05-02	BALLARTO ROAD / EASTERN CONNECTOR
CG150179-T05-03	CRANBOURNE - FRANKSTON ROAD / WOODLANDS ROAD
CG150179-T05-04	CRANBOURNE - FRANKSTON ROAD / CHEVRON AVENUE

MELWAY MAP REF 132 & 133

FOR DISCUSSION ONLY

CAD FILE: SFILE\$

Rev	Date	Description	Drawn	Appr.
P3	12.10.15	AMENDED AS PER MPA COMMENTS	AY	TM
P2	18.09.15	ROAD NAME AMENDMENT	AY	TM
P1	07.09.15	ISSUED FOR INFORMATION	AY	TM

0 50 100 200
1:10,000 @ A3

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES SHOWN ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE.

GENERAL NOTES
1. ALL DIMENSIONS TO FACE OF KERB AND CHANNEL U.N.O.
2. CADASTRAL INFORMATION OBTAINED FROM VICMAP DATA.
3. LIDAR BASE OBTAINED FROM MPA.
4. CRANBOURNE - FRANKSTON ROAD AND SURROUNDS BASE OBTAINED FROM VICROADS

Cardno
Shaping the Future
ABN: 47 106 610 913
501 Swanston Street, Melbourne, VIC Australia 3000
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Email: victoria@cardno.com.au Web: www.cardno.com.au/victoria

Drawn	A.YIANNOUDES
Designed	A.YIANNOUDES
Checked	R.TABE
Authorised	T.McKINLEY

Client: METROPOLITAN PLANNING AUTHORITY
Project: BROMPTON LODGE PSP
CRANBOURNE SOUTH
Title: ULTIMATE INTERSECTION DESIGN
CONCEPT LAYOUT
COVER SHEET - LOCALITY PLAN

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

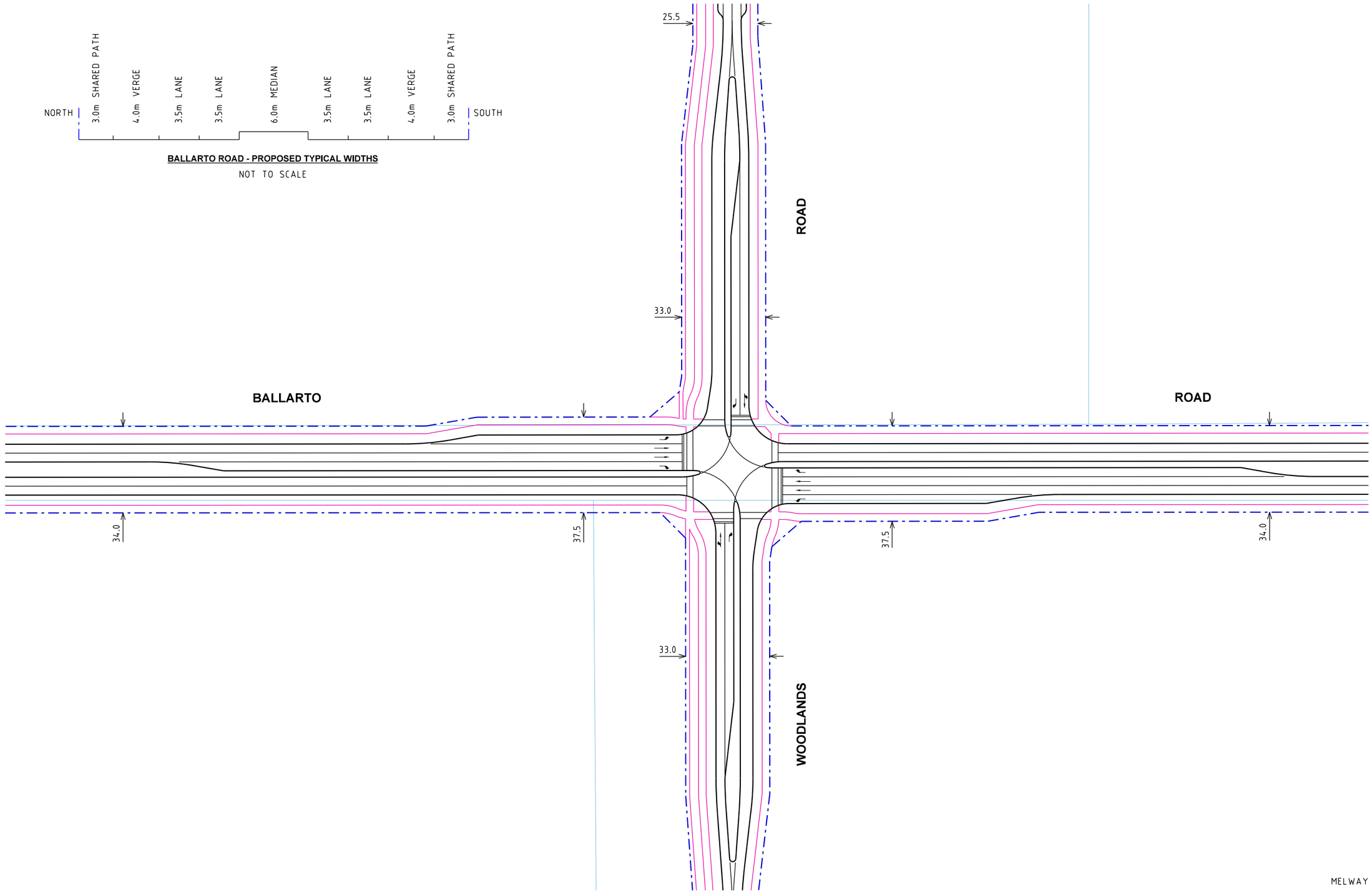
Date	Scale	Size
07.09.15	1:10,000	A3

Project Number	Sheet Number	Revision
CG150179	T05 - 00	P3

DATE PLOTTED: 12/10/2015 5:08:55 PM BY: andrew.yiannoudes

BALLARTO ROAD - PROPOSED TYPICAL WIDTHS

NOT TO SCALE



MELWAY MAP REF 132 & 133

FOR DISCUSSION ONLY

Rev	Date	Description	Drawn	Appr.
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P2	18.09.15	ROAD NAME AMENDMENT	AY	TM
P1	07.09.15	ISSUED FOR INFORMATION	AY	TM

CAD FILE: SFILE\$

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1:1500 @ A3

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GENERAL NOTES
1. ALL DIMENSIONS TO FACE OF KERB AND CHANNEL U.N.O.
2. CADASTRAL INFORMATION OBTAINED FROM VICMAP DATA.
3. LIDAR BASE OBTAINED FROM MPA.
4. CRANBOURNE - FRANKSTON ROAD AND SURROUNDS BASE OBTAINED FROM VICROADS

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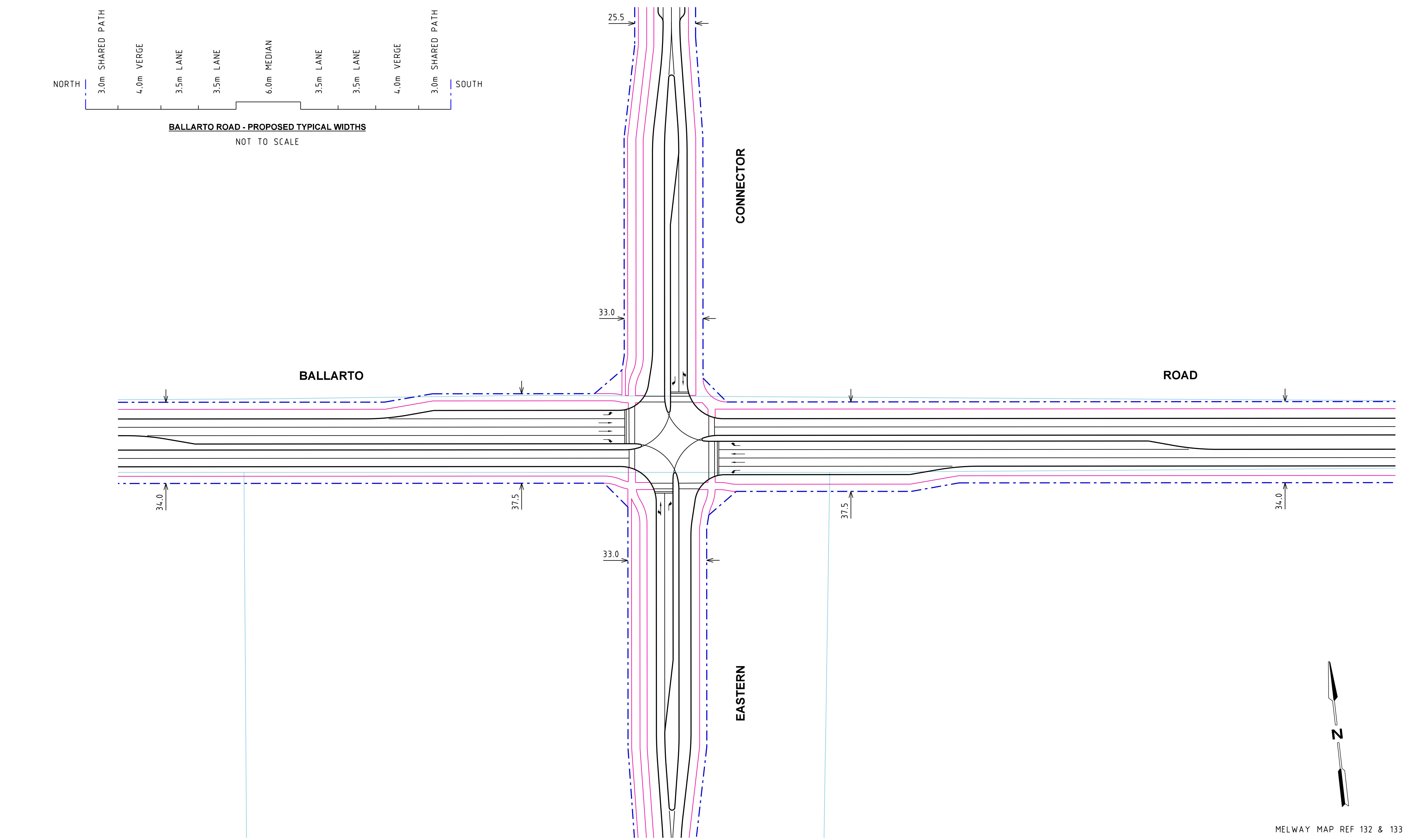
Designed: A.YIANNOUDES
Checked: R.TABE
Authorised: T.McKINLEY

Client: METROPOLITAN PLANNING AUTHORITY
Project: BROMPTON LODGE PSP
CRANBOURNE SOUTH
Title: ULTIMATE INTERSECTION DESIGN
CONCEPT LAYOUT
BALLARTO ROAD AND WOODLANDS ROAD

Status: **PRELIMINARY**
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Date	Scale	Size
07.09.15	1:1500	A3

Project Number	Sheet Number	Revision
CG150179	T05 - 01	P3



FOR DISCUSSION ONLY

Rev	Date	Description	Drawn	Appr.
P3	12.10.15	AMENDED AS PER MPA COMMENTS	AY	TM
P2	18.09.15	ROAD NAME AMENDMENT	AY	TM
P1	07.09.15	ISSUED FOR INFORMATION	AY	TM

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1:1500 @ A3

WARNING
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GENERAL NOTES
1. ALL DIMENSIONS TO FACE OF KERB AND CHANNEL U.N.O.
2. CADASTRAL INFORMATION OBTAINED FROM VICMAP DATA.
3. LIDAR BASE OBTAINED FROM MPA.
4. CRANBOURNE - FRANKSTON ROAD AND SURROUNDS BASE OBTAINED FROM VICROADS

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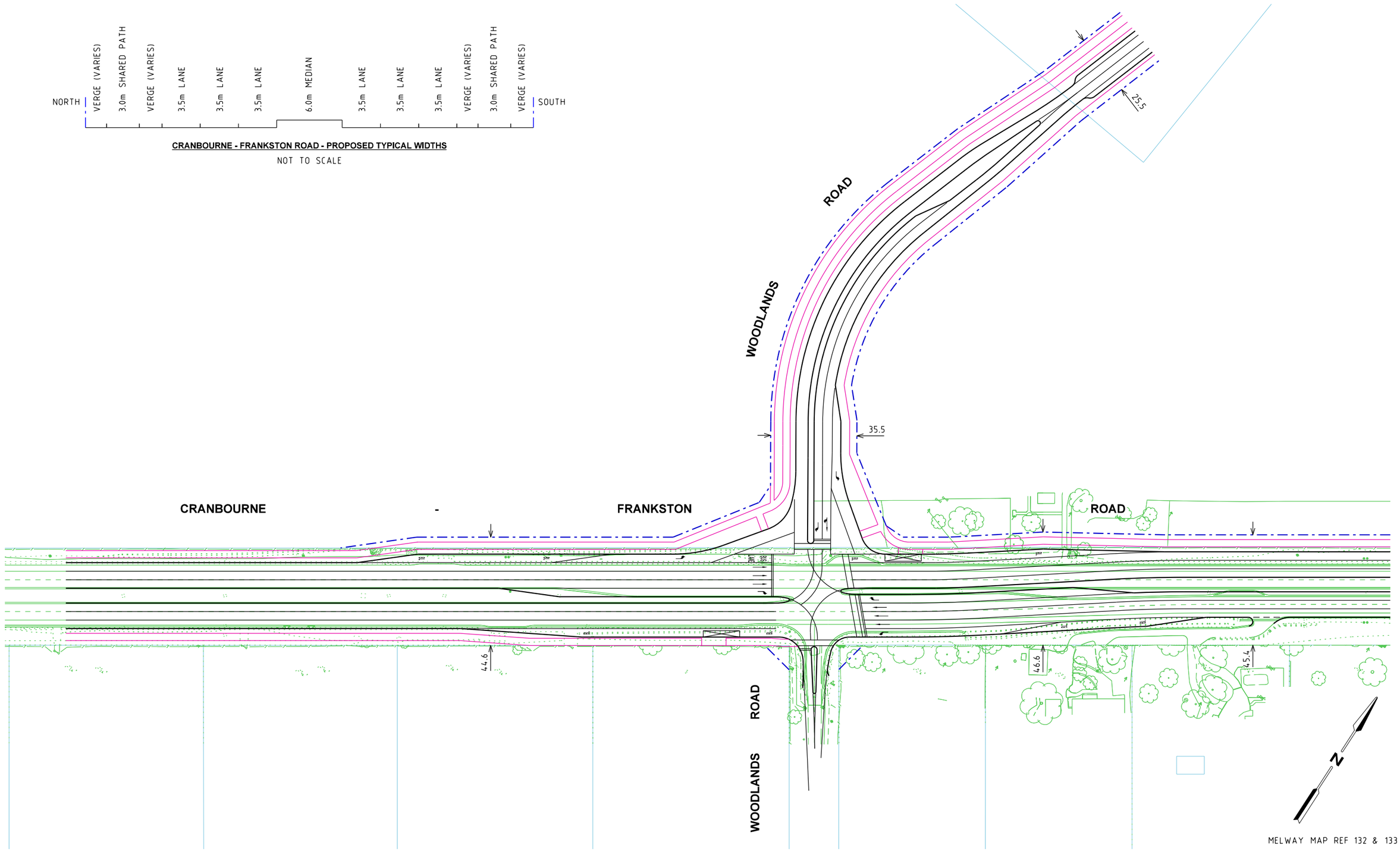
Drawn	A.YIANNOUDES
Designed	A.YIANNOUDES
Checked	R.TABE
Authorised	T.McKINLEY
Client	METROPOLITAN PLANNING AUTHORITY
Project	BROMPTON LODGE PSP CRANBOURNE SOUTH
Title	ULTIMATE INTERSECTION DESIGN CONCEPT LAYOUT BALLARTO ROAD AND EASTERN CONNECTOR
Status	PRELIMINARY NOT TO BE USED FOR CONSTRUCTION PURPOSES
Date	07.09.15
Scale	1:1500
Size	A3
Project Number	CG150179
Sheet Number	T05 - 02
Revision	P3

DATE PLOTTED: 12/10/2015 5:09:36 PM BY: andrew.yiannoudes
CAD FILE: $FILEL$

DATE PLOTTED: 12/10/2015 5:08:54 PM BY: andrew.yiannoudes

CRANBOURNE - FRANKSTON ROAD - PROPOSED TYPICAL WIDTHS

NOT TO SCALE



MELWAY MAP REF 132 & 133

FOR DISCUSSION ONLY

CAD FILE: SFILE\$

Rev	Date	Description	Drawn	Appr.
P3	12.10.15	AMENDED AS PER MPA COMMENTS	AY	TM
P2	18.09.15	ROAD NAME AMENDMENT	AY	TM
P1	07.09.15	ISSUED FOR INFORMATION	AY	TM

0 7.5 15 30
1:1500 @ A3

WARNING
BEWARE OF UNDERGROUND SERVICES
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GENERAL NOTES
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3. LIDAR BASE OBTAINED FROM MPA.
4. CRANBOURNE - FRANKSTON ROAD AND SURROUNDS BASE OBTAINED FROM VICROADS

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Drawn: A.YIANNOUDES
Designed: A.YIANNOUDES
Checked: R.TABE
Authorised: T.McKINLEY

Client: METROPOLITAN PLANNING AUTHORITY
Project: BROMPTON LODGE PSP
CRANBOURNE SOUTH
Title: ULTIMATE INTERSECTION DESIGN
CONCEPT LAYOUT
CRANBOURNE - FRANKSTON RD AND WOODLANDS RD

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Date: 07.09.15
Scale: 1:1500
Size: A3
Project Number: CG150179
Sheet Number: T05 - 03
Revision: P3

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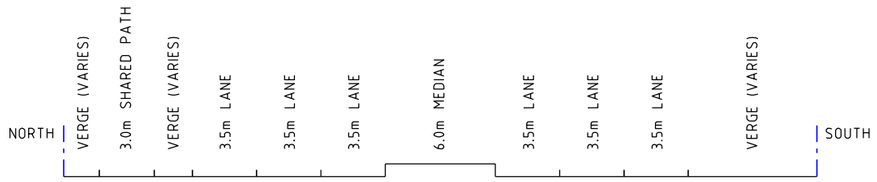
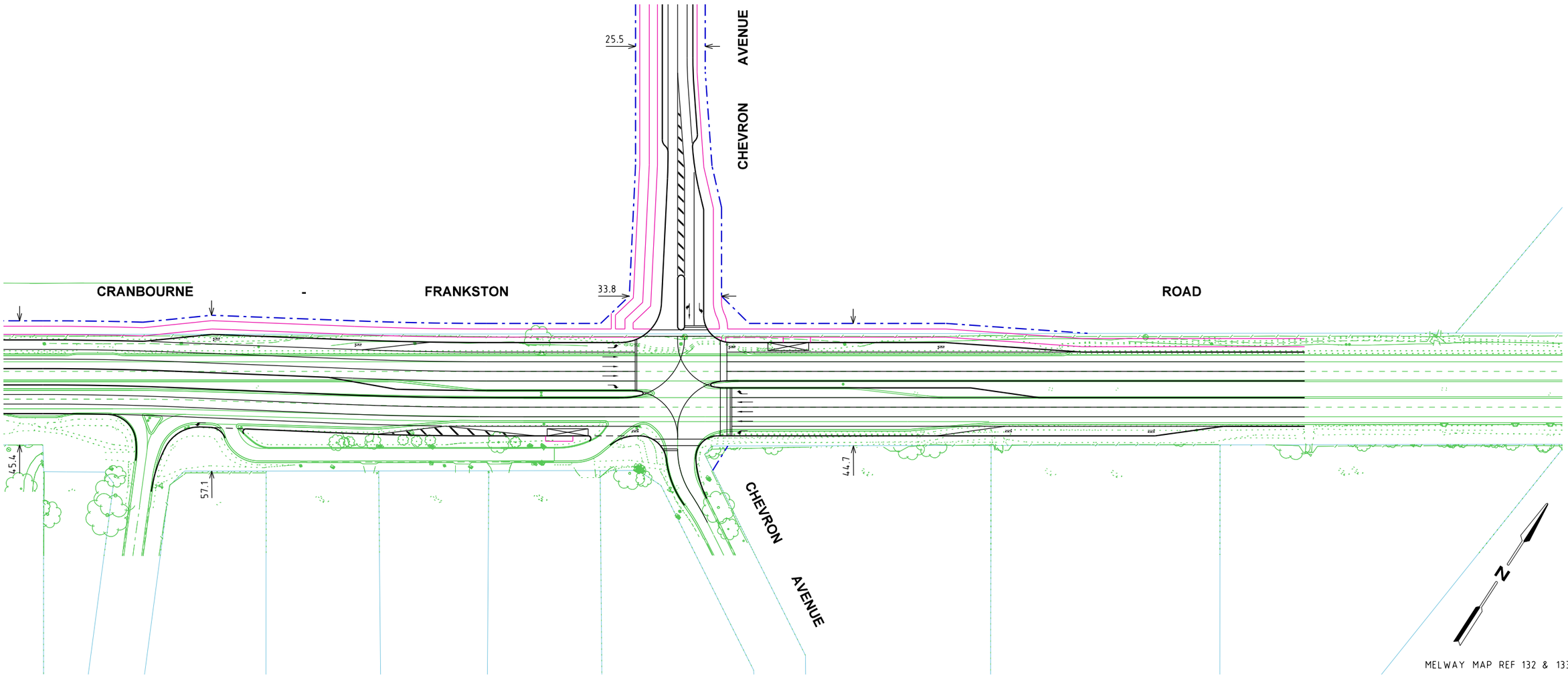


CRANBOURNE - FRANKSTON ROAD - PROPOSED TYPICAL WIDTHS

NOT TO SCALE



MELWAY MAP REF 132 & 133

FOR DISCUSSION ONLY

Rev	Date	Description	Drawn	Appr.
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P2	18.09.15	ROAD NAME AMENDMENT	AY	TM
P1	07.09.15	ISSUED FOR INFORMATION	AY	TM

0 7.5 15 30
1:1500 @ A3

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES SHOWN ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE.

GENERAL NOTES
1. ALL DIMENSIONS TO FACE OF KERB AND CHANNEL U.N.O.
2. CADASTRAL INFORMATION OBTAINED FROM VICMAP DATA.
3. LIDAR BASE OBTAINED FROM MPA.
4. CRANBOURNE - FRANKSTON ROAD AND SURROUNDS BASE OBTAINED FROM VICROADS

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Drawn: A.YIANNOUDES
Designed: A.YIANNOUDES
Checked: R.TABE
Authorised: T.McKINLEY

Client: METROPOLITAN PLANNING AUTHORITY
Project: BROMPTON LODGE PSP
CRANBOURNE SOUTH
Title: ULTIMATE INTERSECTION DESIGN
CONCEPT LAYOUT
CRANBOURNE - FRANKSTON RD AND CHEVRON AVE

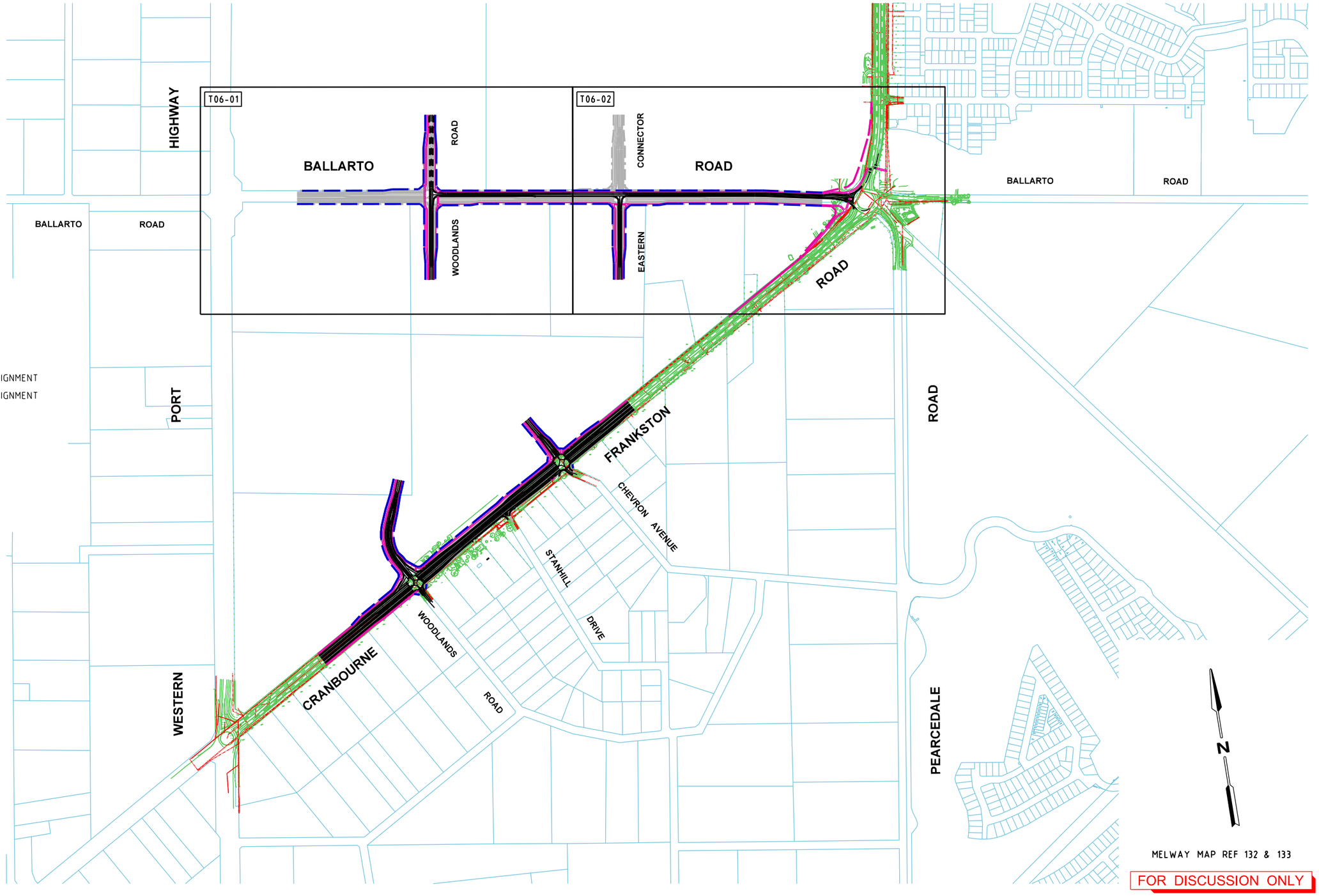
Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Date	Scale	Size
07.09.15	1:1500	A3

Project Number	Sheet Number	Revision
CG150179	T05 - 04	P3

CAD FILE: SHEETS

BROMPTON LODGE PSP
INTERIM ALIGNMENT DESIGN



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CG150179-T06-00	COVER SHEET
CG150179-T06-01	BALLARTO ROAD ALIGNMENT
CG150179-T06-02	BALLARTO ROAD ALIGNMENT

MELWAY MAP REF 132 & 133

FOR DISCUSSION ONLY

Rev	Date	Description	Drawn	Appr.
P5	20.10.15	ADDED TYPICAL WIDTHS SECTION	AY	TM
P4	16.10.15	AMENDED BALLARTO ROAD INTERSECTIONS	AY	TM
P3	13.10.15	AMENDED AS PER MPA COMMENTS	AY	TM
P2	18.09.15	BALLARTO ROAD CARRIAGEWAY SHIFTED TO NORTH, ADDED POS	AY	TM
P1	08.09.15	ISSUED FOR INFORMATION	AY	TM

0 50 100 200
1:10,000 @ A3

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES SHOWN ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE.

GENERAL NOTES
1. ALL DIMENSIONS TO FACE OF KERB AND CHANNEL U.N.O.
2. CADASTRAL INFORMATION OBTAINED FROM VICMAP DATA.
3. LIDAR BASE OBTAINED FROM MPA.
4. CRANBOURNE - FRANKSTON ROAD AND SURROUNDS BASE OBTAINED FROM VICROADS.
5. ULTIMATE SHOWN IN GREY.

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Drawn	A.YIANNOUDES
Designed	A.YIANNOUDES
Checked	R.TABE
Authorised	T.McKINLEY

Client: METROPOLITAN PLANNING AUTHORITY
Project: BROMPTON LODGE PSP
CRANBOURNE SOUTH
Title: INTERIM ALIGNMENT DESIGN
CONCEPT LAYOUT
COVER SHEET - LOCALITY PLAN

Status: **PRELIMINARY**
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Date	Scale	Size
08.09.15	1:10,000	A3
Project Number	Sheet Number	Revision
CG150179	T06 - 00	P5

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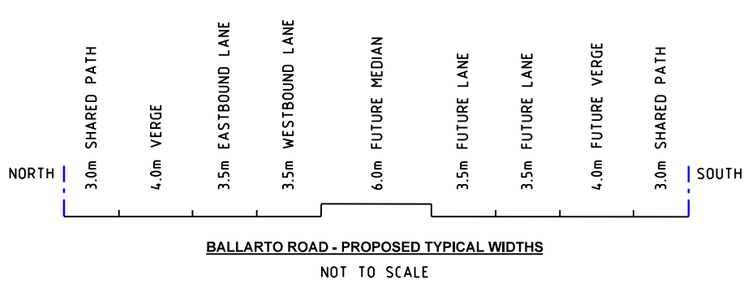

BALLARTO ROAD - PROPOSED TYPICAL WIDTHS

NOT TO SCALE

HIGHWAY

BALLARTO

ROAD

PORT

WESTERN

WOODLANDS

EXTENT OF DESIGN

EXTENT OF DESIGN

25.5

33.0

37.5

34.0

33.0

25.5

FOR CONTINUATION REFER TO CARDNO SHEET NUMBER T06-02

N

MELWAY MAP REF 132 & 133

FOR DISCUSSION ONLY

Rev	Date	Description	Drawn	Appr.
P5	20.10.15	ADDED TYPICAL WIDTHS SECTION	AY	TM
P4	16.10.15	AMENDED BALLARTO ROAD INTERSECTIONS	AY	TM
P3	13.10.15	AMENDED AS PER MPA COMMENTS	AY	TM
P2	18.09.15	BALLARTO ROAD CARRIAGEWAY SHIFTED TO NORTH, ADDED POS	AY	TM
P1	08.09.15	ISSUED FOR INFORMATION	AY	TM

0 12.5 25 50

1:2500 @ A3

WARNING

BEWARE OF UNDERGROUND SERVICES

THE LOCATIONS OF UNDERGROUND SERVICES SHOWN ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE.

GENERAL NOTES

1. ALL DIMENSIONS TO FACE OF KERB AND CHANNEL U.N.O.
2. CADASTRAL INFORMATION OBTAINED FROM VICMAP DATA.
3. LIDAR BASE OBTAINED FROM MPA.
4. CRANBOURNE - FRANKSTON ROAD AND SURROUNDS BASE OBTAINED FROM VICROADS.
5. ULTIMATE SHOWN IN GREY.

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Drawn: A.YIANNOUDES
Designed: A.YIANNOUDES
Checked: R.TABE
Authorised: T.McKINLEY

Client: METROPOLITAN PLANNING AUTHORITY

Project: BROMPTON LODGE PSP
CRANBOURNE SOUTH

Title: INTERIM ALIGNMENT DESIGN
CONCEPT LAYOUT
BALLARTO ROAD - RD-01

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Date	Scale	Size
08.09.15	1:2500	A3

Project Number	Sheet Number	Revision
CG150179	T06 - 01	P5

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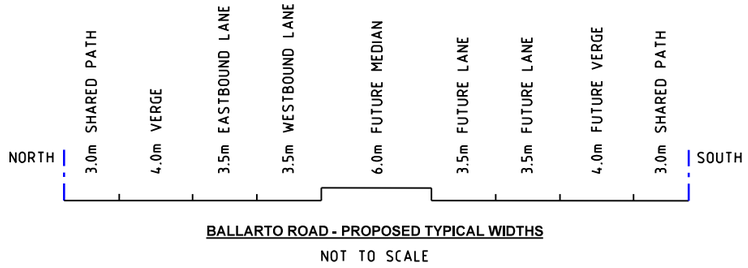
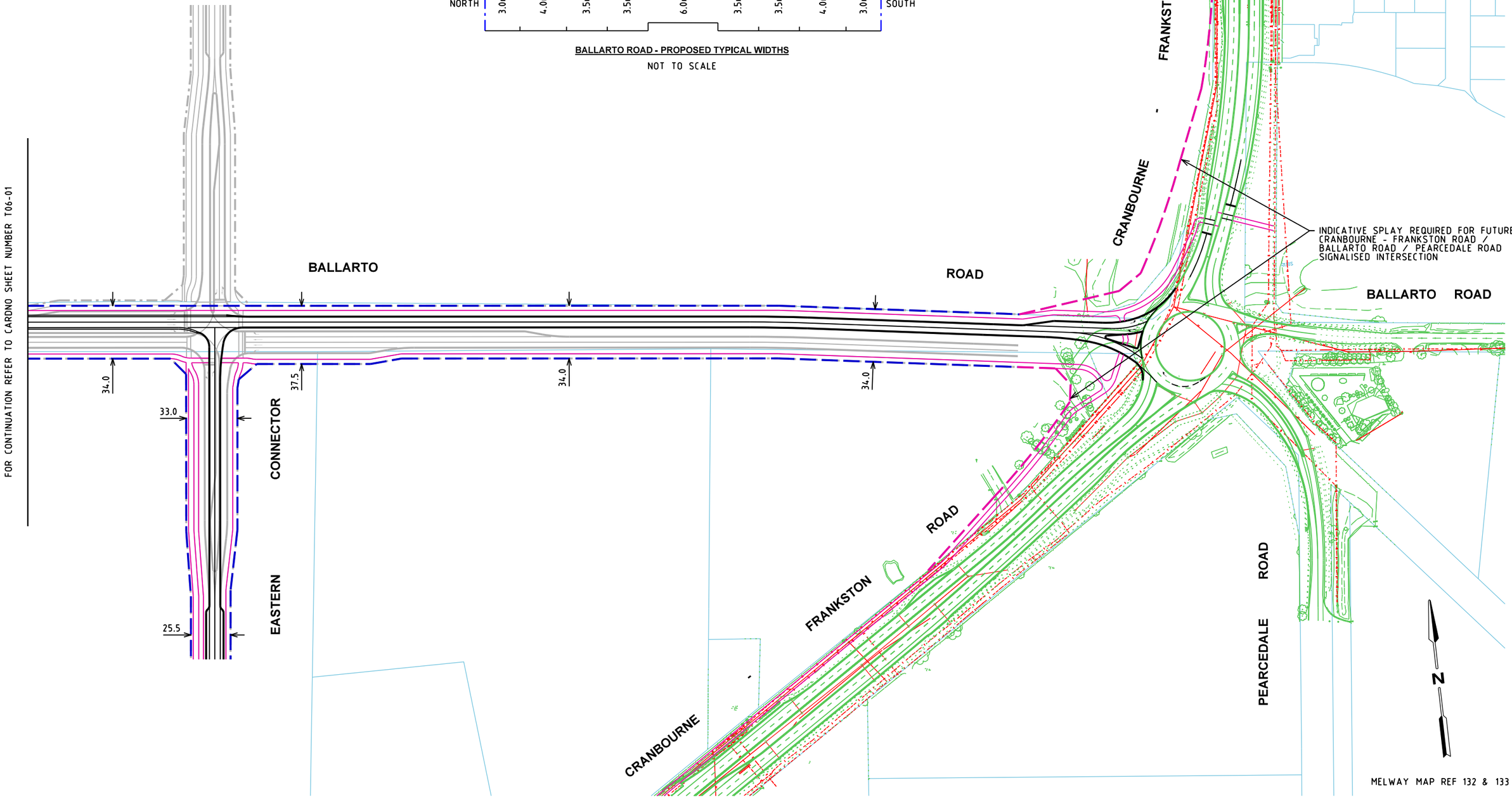


BALLARTO ROAD - PROPOSED TYPICAL WIDTHS

NOT TO SCALE



MELWAY MAP REF 132 & 133

FOR DISCUSSION ONLY

Rev	Date	Description	Drawn	Appr.
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P4	16.10.15	AMENDED BALLARTO ROAD INTERSECTIONS	AY	TM
P3	13.10.15	AMENDED AS PER MPA COMMENTS	AY	TM
P2	18.09.15	BALLARTO ROAD CARRIAGEWAY SHIFTED TO NORTH, ADDED POS	AY	TM
P1	08.09.15	ISSUED FOR INFORMATION	AY	TM

0 12.5 25 50
1:2500 @ A3

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES SHOWN ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE.

GENERAL NOTES
1. ALL DIMENSIONS TO FACE OF KERB AND CHANNEL U.N.O.
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3. LIDAR BASE OBTAINED FROM MPA.
4. CRANBOURNE - FRANKSTON ROAD AND SURROUNDS BASE OBTAINED FROM VICROADS.
5. ULTIMATE SHOWN IN GREY.

Cardno
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Email: victoria@cardno.com.au Web: www.cardno.com.au/victoria

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Designed: A.YIANNOUDES
Checked: R.TABE
Authorised: T.McKINLEY

Client: METROPOLITAN PLANNING AUTHORITY
Project: BROMPTON LODGE PSP
CRANBOURNE SOUTH
Title: INTERIM ALIGNMENT DESIGN
CONCEPT LAYOUT
BALLARTO ROAD - RD-01

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Date	Scale	Size
08.09.15	1:2500	A3

Project Number	Sheet Number	Revision
CG150179	T06 - 02	P5

CAD FILE: O:\DRAFT\AFF\2015\CG150179 - Brompton Lodge PSP\Drawings\CG150179-T06P5.dgn
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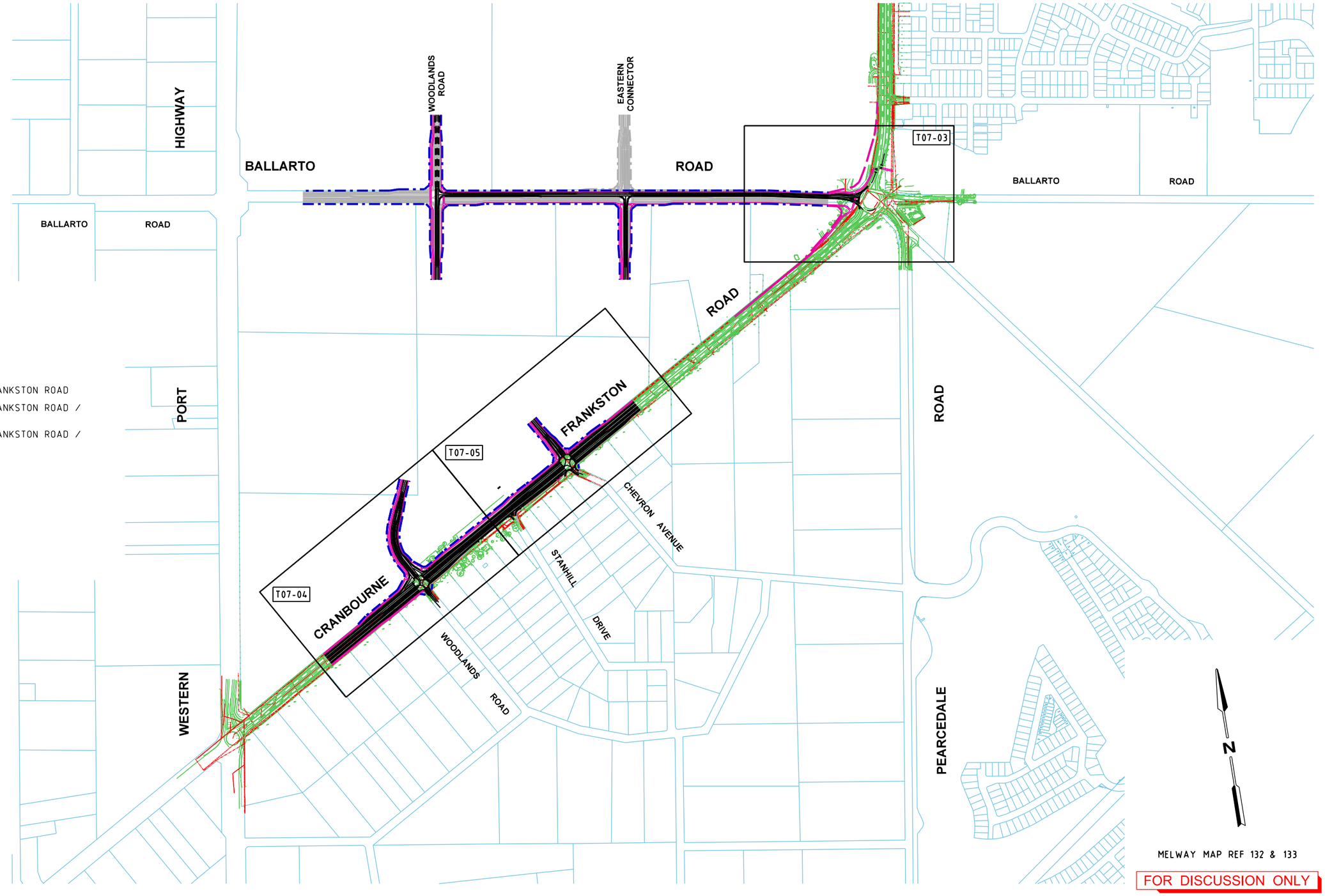
BROMPTON LODGE PSP
INTERIM INTERSECTION DESIGN



DRAWING LIST

CG150179-T07-00	COVER SHEET
CG150179-T07-03	BALLARTO ROAD / CRANBOURNE - FRANKSTON ROAD
CG150179-T07-04	CRANBOURNE - FRANKSTON ROAD / WOODLANDS ROAD
CG150179-T07-05	CRANBOURNE - FRANKSTON ROAD / CHEVRON AVENUE

MELWAY MAP REF 132 & 133

FOR DISCUSSION ONLY

Rev	Date	Description	Drawn	Appr.
P5	29.10.15	REMOVED SHEETS T07-01 AND T07-02	AY	TM
P4	16.10.15	AMENDED BALLARTO ROAD INTERSECTIONS	AY	TM
P3	13.10.15	AMENDED AS PER MPA COMMENTS	AY	TM
P2	18.09.15	BALLARTO ROAD CARRIAGEWAY SHIFTED TO NORTH, ADDED POS	AY	TM
P1	08.09.15	ISSUED FOR INFORMATION	AY	TM

0 50 100 200
1:10,000 @ A3

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES SHOWN ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE.

GENERAL NOTES
1. ALL DIMENSIONS TO FACE OF KERB AND CHANNEL U.N.O.
2. CADASTRAL INFORMATION OBTAINED FROM VICMAP DATA.
3. LIDAR BASE OBTAINED FROM MPA.
4. CRANBOURNE - FRANKSTON ROAD AND SURROUNDS BASE OBTAINED FROM VICROADS
5. ULTIMATE SHOWN IN GREY

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Drawn	A.YIANNOUDES
Designed	A.YIANNOUDES
Checked	R.TABE
Authorised	T.McKINLEY

Client: METROPOLITAN PLANNING AUTHORITY
Project: BROMPTON LODGE PSP
CRANBOURNE SOUTH
Title: INTERIM INTERSECTION DESIGN
CONCEPT LAYOUT
COVER SHEET - LOCALITY PLAN

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Date	Scale	Size
08.09.15	1:10,000	A3
Project Number	Sheet Number	Revision
CG150179	T07 - 00	P5

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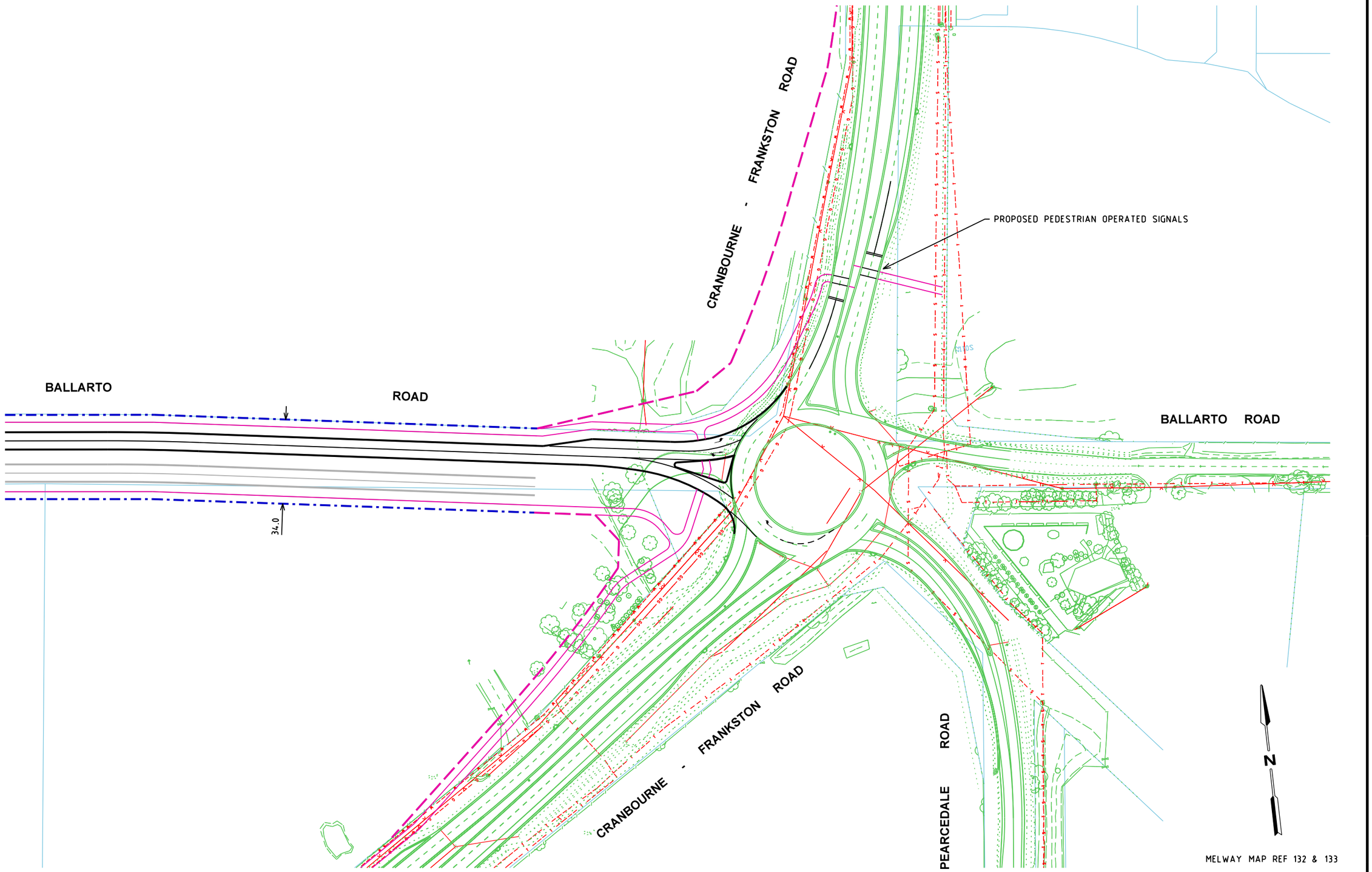

MELWAY MAP REF 132 & 133

FOR DISCUSSION ONLY

Rev	Date	Description	Drawn	Appr.
P5	29.10.15	REMOVED SHEETS T07-01 AND T07-02	AY	TM
P4	16.10.15	AMENDED BALLARTO ROAD INTERSECTIONS	AY	TM
P3	13.10.15	AMENDED AS PER MPA COMMENTS	AY	TM
P2	18.09.15	BALLARTO ROAD CARRIAGEWAY SHIFTED TO NORTH, ADDED POS	AY	TM
P1	08.09.15	ISSUED FOR INFORMATION	AY	TM

0 7.5 15 30
1:1500 @ A3

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4. CRANBOURNE - FRANKSTON ROAD AND SURROUNDS BASE OBTAINED FROM VICROADS
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Drawn: A.YIANNOUDES
Designed: A.YIANNOUDES
Checked: R.TABE
Authorised: T.McKINLEY

Client: METROPOLITAN PLANNING AUTHORITY
Project: BROMPTON LODGE PSP
CRANBOURNE SOUTH
Title: INTERIM INTERSECTION DESIGN
CONCEPT LAYOUT
BALLARTO ROAD AND CRANBOURNE-FRANKSTON RD

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Date: 08.09.15
Scale: 1:1500
Size: A3
Project Number: CG150179
Sheet Number: T07 - 03
Revision: P5

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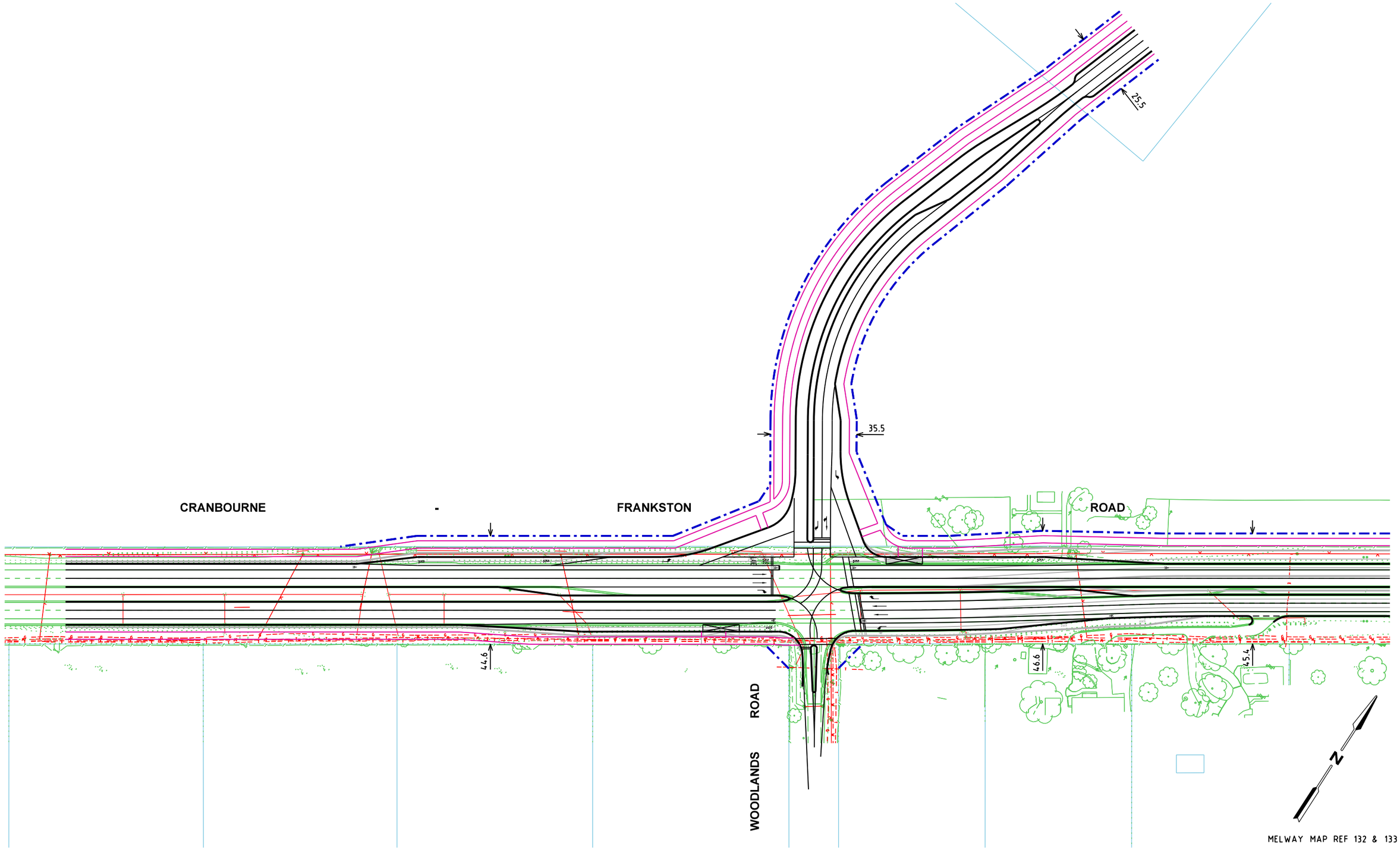

MELWAY MAP REF 132 & 133

FOR DISCUSSION ONLY

Rev	Date	Description	Drawn	Appr.
P5	29.10.15	REMOVED SHEETS T07-01 AND T07-02	AY	TM
P4	16.10.15	AMENDED BALLARTO ROAD INTERSECTIONS	AY	TM
P3	13.10.15	AMENDED AS PER MPA COMMENTS	AY	TM
P2	18.09.15	BALLARTO ROAD CARRIAGEWAY SHIFTED TO NORTH, ADDED POS	AY	TM
P1	08.09.15	ISSUED FOR INFORMATION	AY	TM

0 7.5 15 30
1:1500 @ A3

WARNING
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Drawn: A.YIANNOUDES
Designed: A.YIANNOUDES
Checked: R.TABE
Authorised: T.McKINLEY

Client: METROPOLITAN PLANNING AUTHORITY
Project: BROMPTON LODGE PSP
CRANBOURNE SOUTH
Title: INTERIM INTERSECTION DESIGN
CONCEPT LAYOUT
CRANBOURNE - FRANKSTON RD AND WOODLANDS RD

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Date: 08.09.15
Scale: 1:1500
Size: A3
Project Number: CG150179
Sheet Number: T07 - 04
Revision: P5

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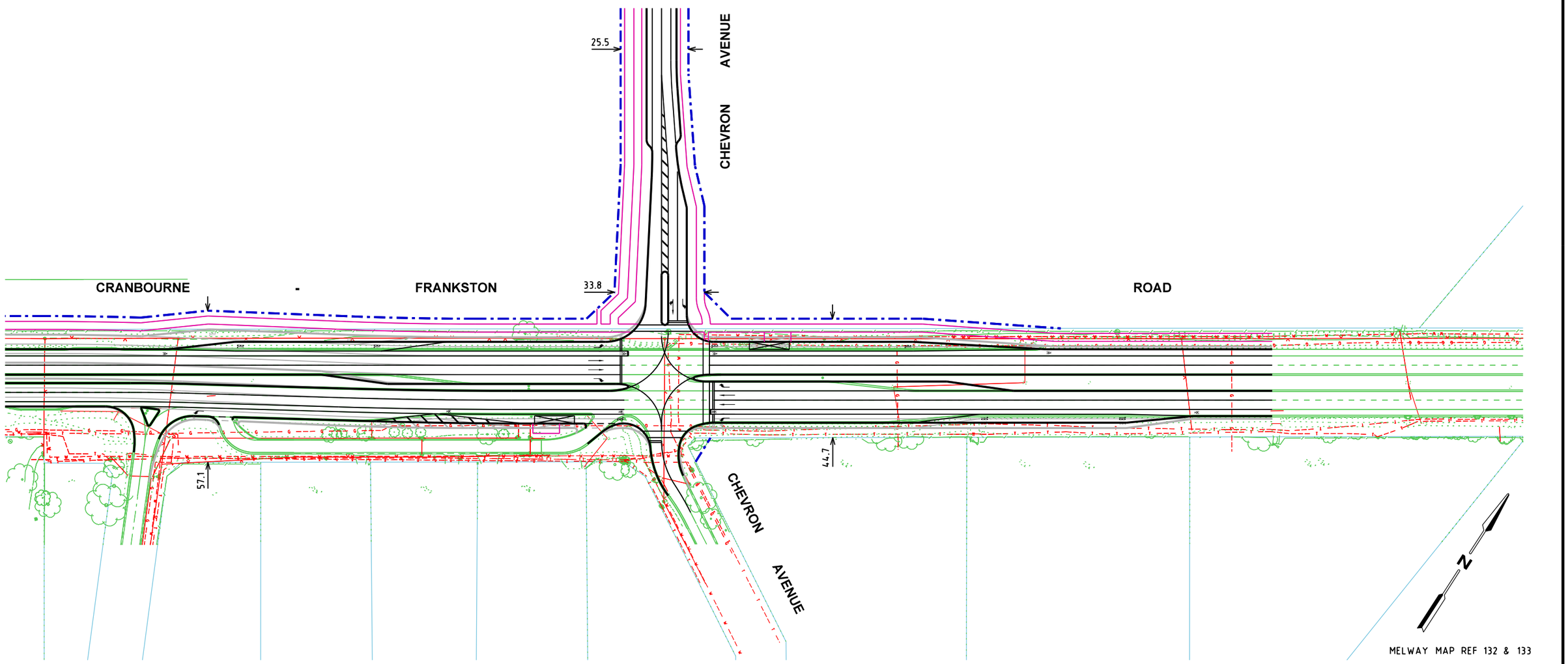

FOR DISCUSSION ONLY

Rev	Date	Description	Drawn	Appr.
P5	29.10.15	REMOVED SHEETS T07-01 AND T07-02	AY	TM
P4	16.10.15	AMENDED BALLARTO ROAD INTERSECTIONS	AY	TM
P3	13.10.15	AMENDED AS PER MPA COMMENTS	AY	TM
P2	18.09.15	BALLARTO ROAD CARRIAGEWAY SHIFTED TO NORTH, ADDED POS	AY	TM
P1	08.09.15	ISSUED FOR INFORMATION	AY	TM

0 7.5 15 30
1:1500 @ A3

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Designed: A.YIANNOUDES
Checked: R.TABE
Authorised: T.McKINLEY

Client: METROPOLITAN PLANNING AUTHORITY
Project: BROMPTON LODGE PSP
CRANBOURNE SOUTH
Title: INTERIM INTERSECTION DESIGN
CONCEPT LAYOUT
CRANBOURNE - FRANKSTON RD AND CHEVRON AVE

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Date: 08.09.15
Scale: 1:1500
Size: A3
Project Number: CG150179
Sheet Number: T07 - 05
Revision: P5

CAD FILE: O:\DRAT\RAFF\2015\CG150179 - Brompton Lodge PSP\Drawings\CG150179-T07P5.dgn

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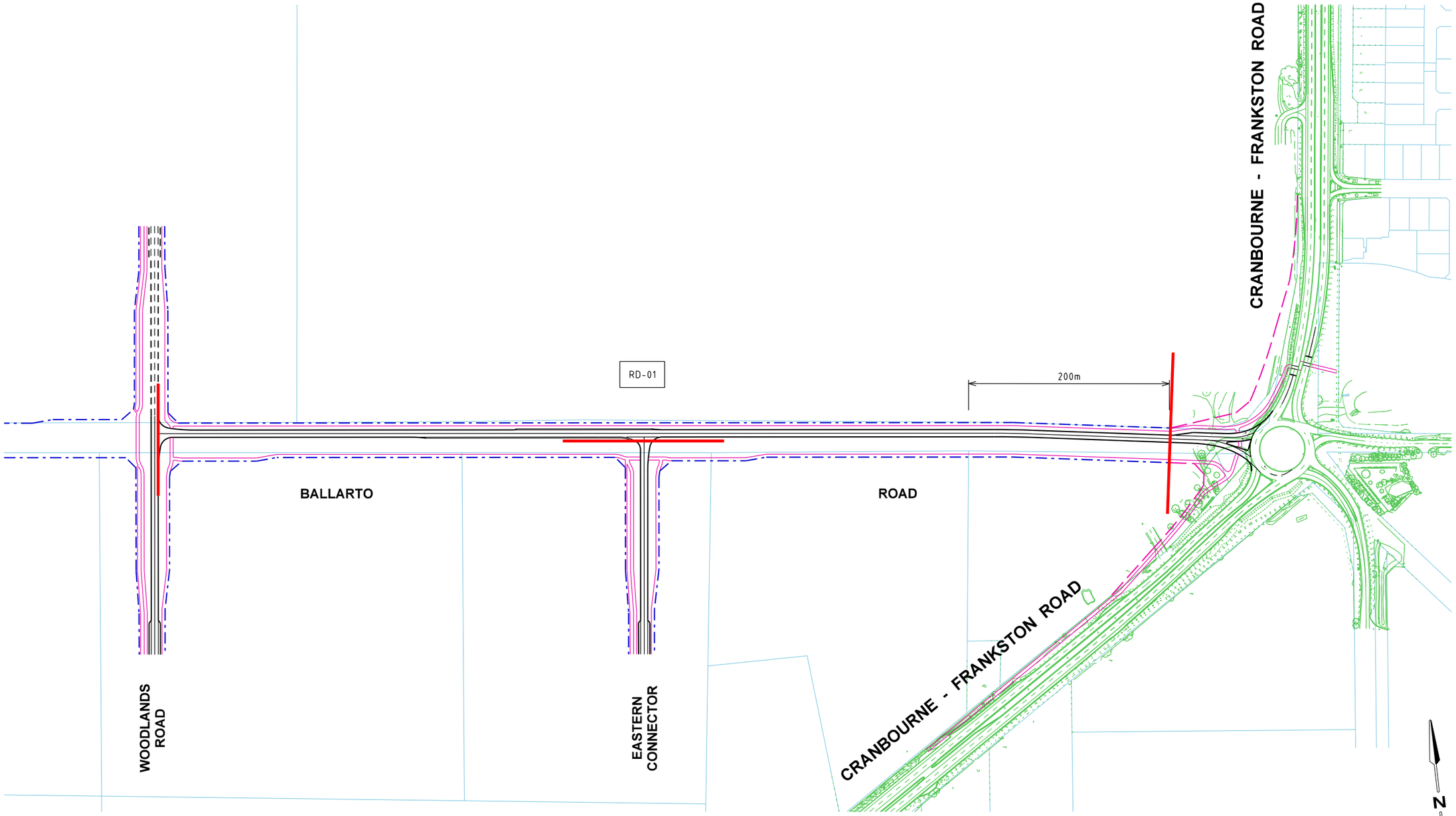

MELWAY MAP REF 132 & 133

FOR DISCUSSION ONLY

CAD FILE: SHEETS

Rev	Date	Description	Drawn	Appr.
P4	20.10.15	MINOR AMENDMENTS	AY	TM
P3	16.10.15	AMENDED EXTENT OF ROAD PROJECT	AY	TM
P2	07.10.15	ADDED PROPERTY DIMENSIONS	AY	TM
P1	07.10.15	ISSUED FOR INFORMATION	AY	TM

0 20 40 80
1:5000 @ A3

WARNING
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Drawn: A.YIANNOUDES
Designed: A.YIANNOUDES
Checked: R.TABE
Authorised: T.McKINLEY

Client: METROPOLITAN PLANNING AUTHORITY
Project: BROMPTON LODGE PSP
CRANBOURNE SOUTH
Title: INTERIM BALLARTO ROAD - ROAD PROJECT RD-01
CONCEPT LAYOUT

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Date	Scale	Size
07.10.15	1:4000	A3

Project Number	Sheet Number	Revision
CG150179	T08	P4

Brompton Lodge PSP

APPENDIX C

SIDRA ANALYSIS RESULTS

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InterSIDRA
(v1.4): 05-Sep-12

Project No: CG150179
Project Name: Brompton lodge PSP

SIDRA File: N:\WINDOWS\2015\CG150179\SIDRA\CG150179SID005.sip

Error Checking: No errors found

Site Summary

No	Link	Site Name	Intersection Title	Intersection Type	DoS	Notes
01		BalWoo Int AM	Ballarto Woodlands AM Interim	Give-Way/Yield	0.229	
02		BalWoo Int PM	Ballarto Woodlands PM Interim	Give-Way/Yield	0.168	
03		BalEC Int AM	Ballarto Road Eastern Connector AM Interim	Give-Way/Yield	0.108	
04		BalEC Int PM	Ballarto Road Eastern Connector PM Interim	Give-Way/Yield	0.140	
05		CFWoo Int AM	Cranbourne Frankston / Woodlands AM Interim	Signals	0.863	
06		CFWoo Int PM	Cranbourne Frankston / Woodlands PM Interim	Signals	0.846	
07		CFChev Int AM	Cranbourne Frankston / Chevron AM Interim	Signals	0.873	
08		CFChev Int PM	Cranbourne Frankston / Chevron PM Interim	Signals	0.837	
09		CFBalPea Int AM	Cranbourne-Frankston/Ballarto/Pearcedale PM Interim	Roundabout	0.661	
10		CFBalPea Int PM	Cranbourne-Frankston/Ballarto/Pearcedale Int AM	Roundabout	0.594	
11		BalWoo Ult AM	Ballarto / Woodlands AM Ultimate	Signals	0.852	
12		BalWoo Ult PM	Ballarto / Woodlands PM Ultimate	Signals	0.761	
13		BalEC Ult AM	Ballarto / Eastern Connector AM Ultimate	Signals	0.782	
14		BalEC Ult PM	Ballarto / Eastern connector PM Ultimate	Signals	0.701	
15		CFWoo Ult AM	Cranbourne Frankston / Woodlands AM Ultimate	Signals	0.882	
16		CFWoo Ult PM	Cranbourne Frankston / Woodlands PM Ultimate	Signals	0.887	
17		CFChev Ult AM	Cranbourne Frankston / Chevron AM Ultimate	Signals	0.834	
18		CFChev Ult PM	Cranbourne Frankston / Chevron PM Ultimate	Signals	0.844	
19						
20						
21						
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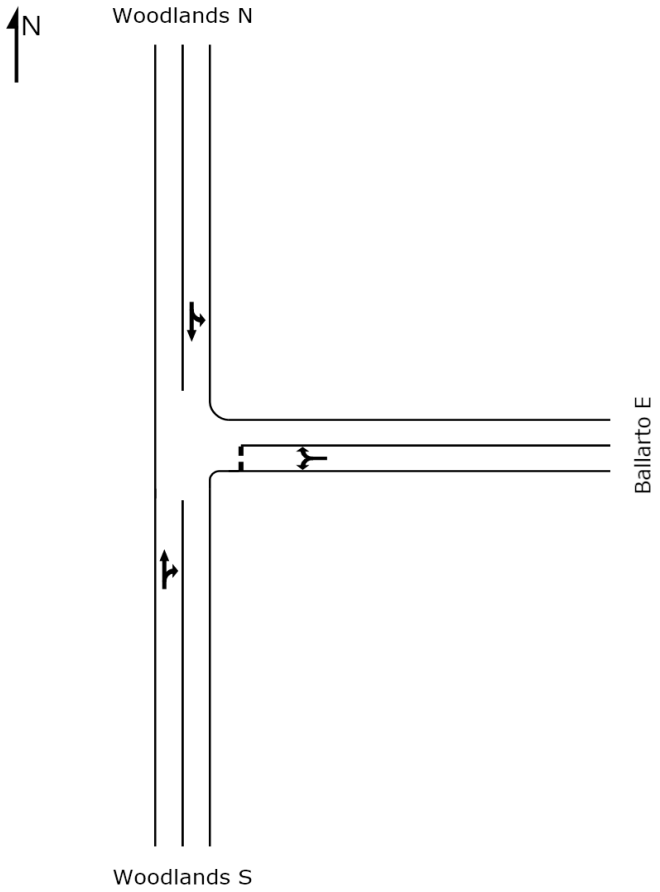
39						
40						

Give-Way/Yield N:\WINDOWS\2015\CG150179\SIDRA\CG150179SID005.sip[BalWoo Int AM]



Woodlands N

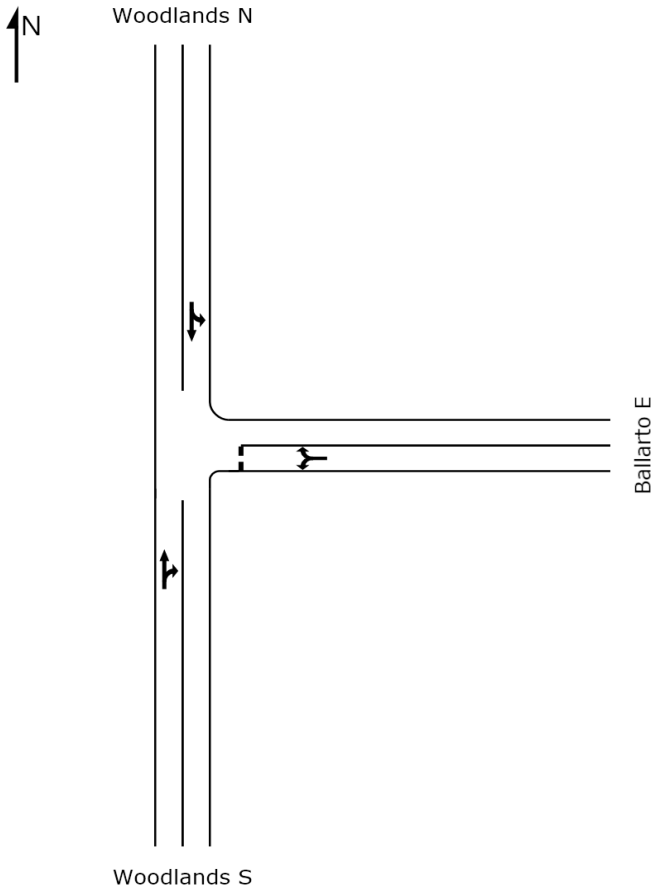
							App	**R**	**T**	**L**							
							3.7	0	0	8.3							
							0	0	0	0							
							0.058	0.000	0.058	0.058							
							107	0	60	47							
							4	0	2	2							
							103	0	58	45							
L	0	0	0.000	0	0	0					*51*	2	*53*	*0.077*	2	*10.9*	***App***
T	0	0	0.000	0	0	0					19	1	20	0.077	2	11.1	**R**
R	0	0	0.000	0	0	0					0	0	0	0.000	0	0	**T**
App	*0*	*0*	*0.000*	*0*	*0*	*0*					32	1	33	0.077	2	10.8	**L**
					512		0	230	128	*358*		**LV***					
					21		0	10	*5*	*15*		**HV***					
					533		0	240	133	*373*		**Total Vol***					
					0.229		0.000	0.229	0.229	0.229		**DoS**					
					10.1		0	10.1	10.1	*10.1*		**95th %ile Back of Queue (m)**					
					4.4		0	0.5	9.1	3.6		**Average Delay (sec)**					
					Intersection		**L**	**T**	**R**	***App***							

Ballarto E

***Output Volumes**

Woodlands S

Give-Way/Yield N:\WINDOWS\2015\CG150179\SIDRA\CG150179SID005.sip[BalWoo Int PM]



Woodlands N

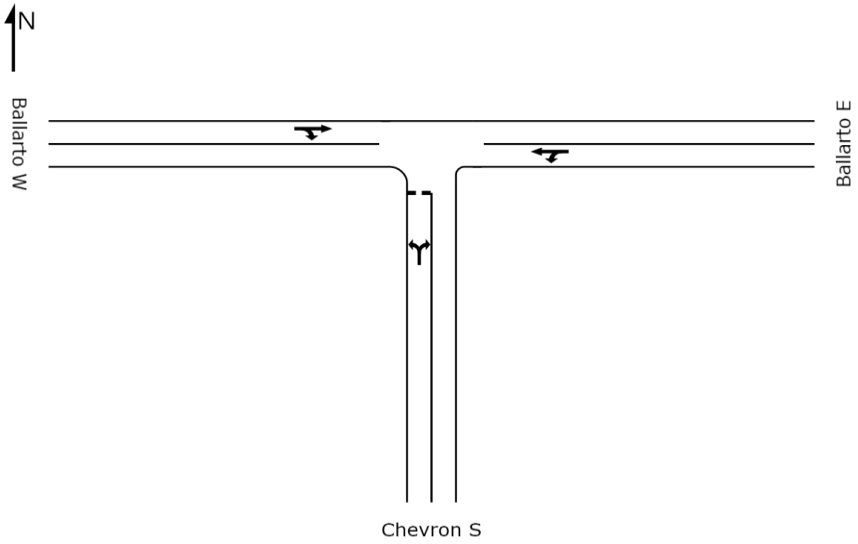
							App	**R**	**T**	**L**						
							1.4	0	0	8.3						
							0	0	0	0						
							0.115	0.000	0.115	0.115						
							215	0	180	35						
							8	0	7	1						
							207	0	173	34						
L	0	0	0.000	0	0	0					127	5	132	*0.168*	*4.8*	*10.5*	***App***
T	0	0	0.000	0	0	0					30	1	31	0.168	4.8	10.7	**R**
R	0	0	0.000	0	0	0					0	0	0	0.000	0	0	**T**
App	*0*	*0*	*0.000*	*0*	*0*	*0*					97	4	101	0.168	4.8	10.4	**L**
					514		0	115	65	*180*		**LV***					
					21		0	5	3	*8*		**HV***					
					535		0	120	68	*188*		**Total Vol***					
					0.168		0.000	0.121	0.121	*0.121*		**DoS**					
					4.9		0	4.9	4.9	*4.9*		**95th %ile Back of Queue (m)**					
					4.6		0	1	9.6	*4.1*		**Average Delay (sec)**					
					Intersection		**L**	**T**	**R**	***App***							

Ballarto E

***Output Volumes**

Woodlands S

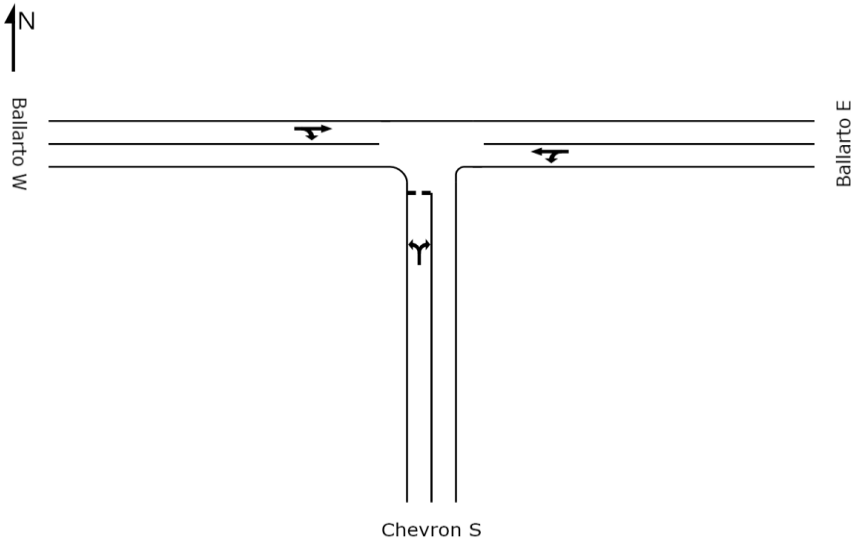
Give-Way/Yield N:\WINDOWS\2015\CG150179\SIDRA\CG150179SID005.sip[BalEC Int AM]



							App	**R**	**T**	**L**					
							0	0	0	0					
							0	0	0	0					
							0.000	0.000	0.000	0.000					
							0	0	0	0					
							0	0	0	0					
							0	0	0	0					
Ballarto W															**Ballarto E**
L	0	0	0.000	0	0	0					*129*	*5*	*134*	*0.074*	0	6.2	***App***
T	0.6	4.4	0.108	133	5	128					0	0	0	0.000	0	0	**R**
R	9.2	4.4	0.108	47	2	45					32	1	33	0.074	0	0	**T**
App	*2.8*	*4.4*	*0.108*	*180*	*7*	*173*					97	4	101	0.074	0	8.3	**L**
					363		19	0	42	*61*		**LV***					
					15		1	0	2	*3*		**HV***					
					378		20	0	44	*64*		**Total Vol***					***Output Volumes**
					0.108		0.091	0.000	0.091	*0.091*		**DoS**					
					4.4		2.5	0	2.5	*2.5*		**95th %ile Back of Queue (m)**					
					5.4		10.4	0	10.7	*10.6*		**Average Delay (sec)**					
					Intersection		**L**	**T**	**R**	***App***							

Chevron S

Give-Way/Yield N:\WINDOWS\2015\CG150179\SIDRA\CG150179SID005.sip[BalEC Int PM]

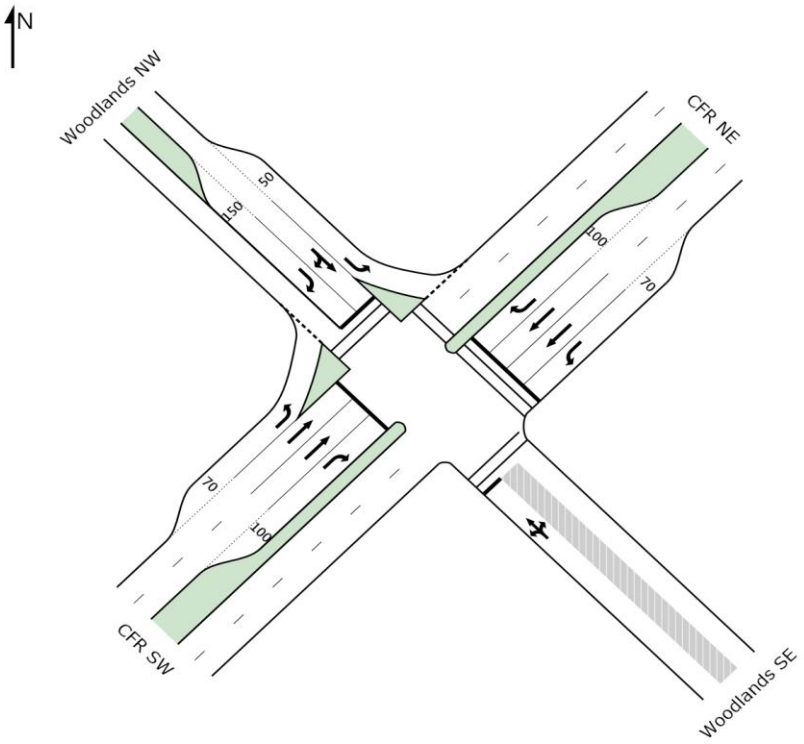


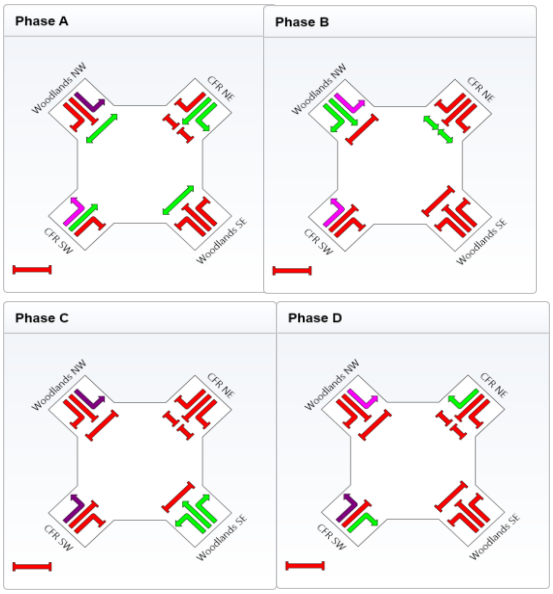
							App	**R**	**T**	**L**						
							0	0	0	0						
							0	0	0	0						
							0.000	0.000	0.000	0.000						
							0	0	0	0						
							0	0	0	0						
							0	0	0	0						
Ballarto W															**Ballarto E**	
L	0	0	0.000	0	0	0					*171*	*7*	*178*	*0.096*	*0*	3.6	***App***
T	0.7	2.5	0.065	68	3	65					0	0	0	0.000	0	0	**R**
R	9.3	2.5	0.065	35	1	34					97	4	101	0.096	0	0	**T**
App	*3.7*	*2.5*	*0.065*	*103*	*4*	99					74	3	*77*	0.096	0	8.3	**L**
					366		30	0	66	96							**LV***
					15		1	0	3	*4*							**HV***
					381		31	0	69	*100*							**Total Vol***
					0.140		0.140	0.000	0.140	*0.140*							**DoS**
					4		4	0	4	*4*							**95th %ile Back of Queue (m)**
					5.5		10.4	0	10.7	*10.6*							**Average Delay (sec)**
					Intersection		**L**	**T**	**R**	***App***							

***Output Volumes**

Chevron S

Signals N:\WINDOWS\2015\CG150179\SIDRA\CG150179SID005.sip[CFWoo Int AM]





Phase	Grn	Total	%
	58	64	58%
	16	22	20%
	6	12	11%
	6	12	11%
Cycle		110	sec

Woodlands NW

	App	R	T	L
	0	0	0	0
	0	0	0	0
	0.000	0.000	0.000	0.000
	0	0	0	0
	0	0	0	0
	0	0	0	0

CFR SW

L	0	0	0.000	0	0	0	*0*	0	0	0.000	0	0	**App**
T	0	0	0.000	0	0	0	0	0	0	0.000	0	0	**R**
R	0	0	0.000	0	0	0	0	0	0	0.000	0	0	**T**
App	*0*	*0*	*0.000*	*0*	*0*	*0*	0	0	0	0.000	0	0	**L**

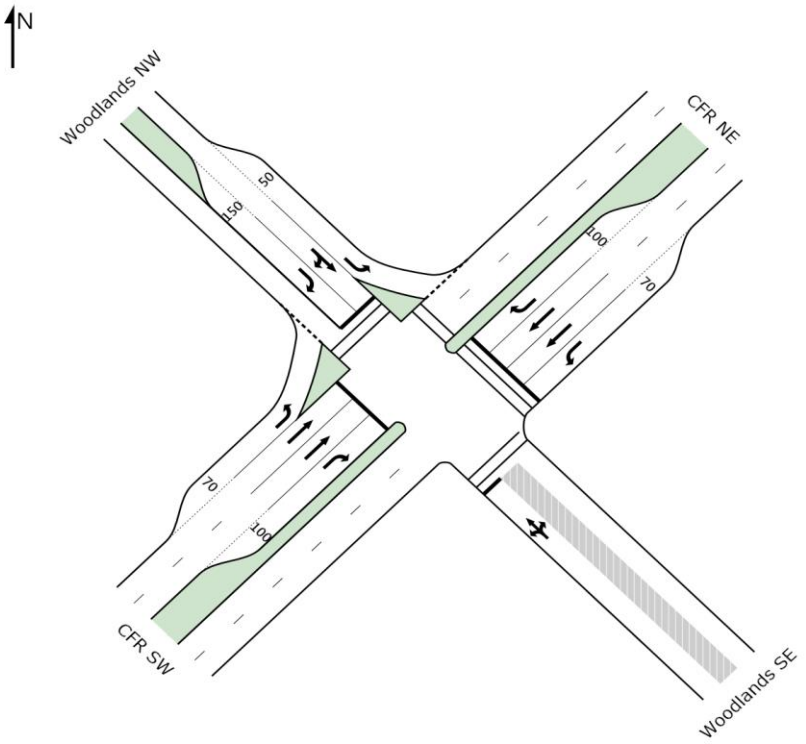
CFR NE

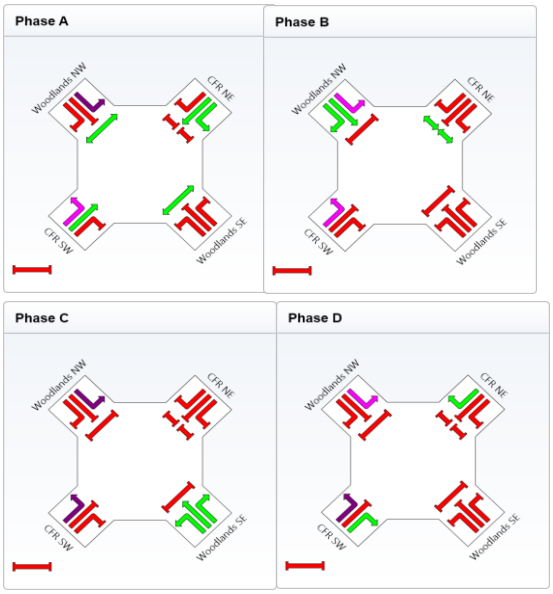
0	0	0	0	*0*	**LV***
0	0	0	0	*0*	**HV***
0	0	0	0	*0*	**Total Vol***
0.863	0.000	0.000	0.000	*0.000*	**DoS**
317.2	0	0	0	*0*	**95th %ile Back of Queue (m)**
28.9	0	0	0	*0*	**Average Delay (sec)**
Intersection	**L**	**T**	**R**	***App***	

***Output Volumes**

Woodlands SE

Signals N:\WINDOWS\2015\CG150179\SIDRA\CG150179SID005.sip[CFWoo Int PM]





Phase	Grn	Total	%
	68	74	62%
	16	22	18%
	6	12	10%
	6	12	10%
Cycle		120	sec

Woodlands NW

	App	R	T	L
	0	0	0	0
	0	0	0	0
	0.000	0.000	0.000	0.000
	0	0	0	0
	0	0	0	0
	0	0	0	0

CFR SW

L	0	0	0.000	0	0	0	*0*	0	0	0.000	0	0	**App**
T	0	0	0.000	0	0	0	0	0	0	0.000	0	0	**R**
R	0	0	0.000	0	0	0	0	0	0	0.000	0	0	**T**
App	*0*	*0*	*0.000*	*0*	*0*	*0*	0	0	0	0.000	0	0	**L**

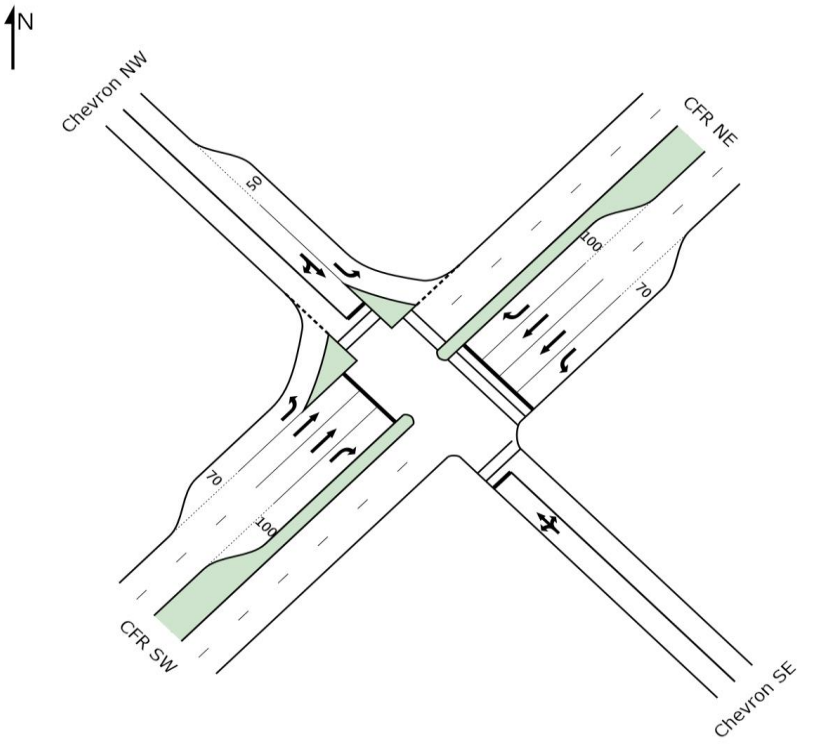
CFR NE

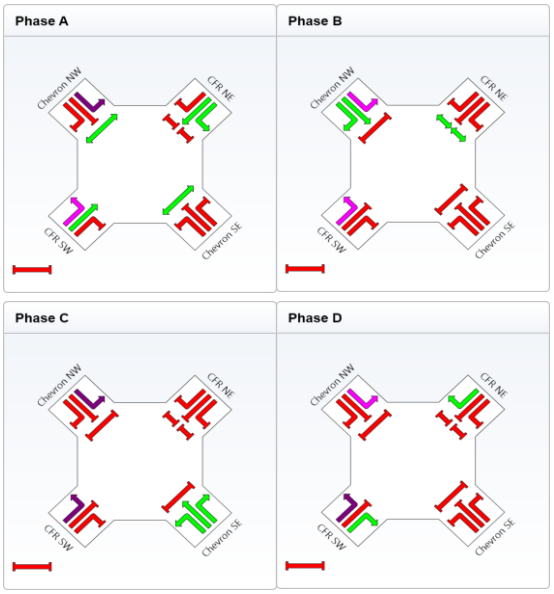
0	0	0	0	*0*	**LV***
0	0	0	0	*0*	**HV***
0	0	0	0	*0*	**Total Vol***
0.846	0.000	0.000	0.000	*0.000*	**DoS**
327.9	0	0	0	*0*	**95th %ile Back of Queue (m)**
24.2	0	0	0	*0*	**Average Delay (sec)**
Intersection	**L**	**T**	**R**	***App***	

***Output Volumes**

Woodlands SE

Signals N:\WINDOWS\2015\CG150179\SIDRA\CG150179SID005.sip[CFChev Int AM]





Phase	Grn	Total	%
	58	64	58%
	16	22	20%
	6	12	11%
	6	12	11%
Cycle		110	sec

Chevron NW

	App	R	T	L
	0	0	0	0
	0	0	0	0
	0.000	0.000	0.000	0.000
	0	0	0	0
	0	0	0	0
	0	0	0	0

CFR SW

L	0	0	0.000	0	0	0				*0*	0	0	0.000	0	0	**App**
T	0	0	0.000	0	0	0				0	0	0	0.000	0	0	**R**
R	0	0	0.000	0	0	0				0	0	0	0.000	0	0	**T**
App	*0*	*0*	*0.000*	*0*	*0*	*0*				0	0	0	0.000	0	0	**L**

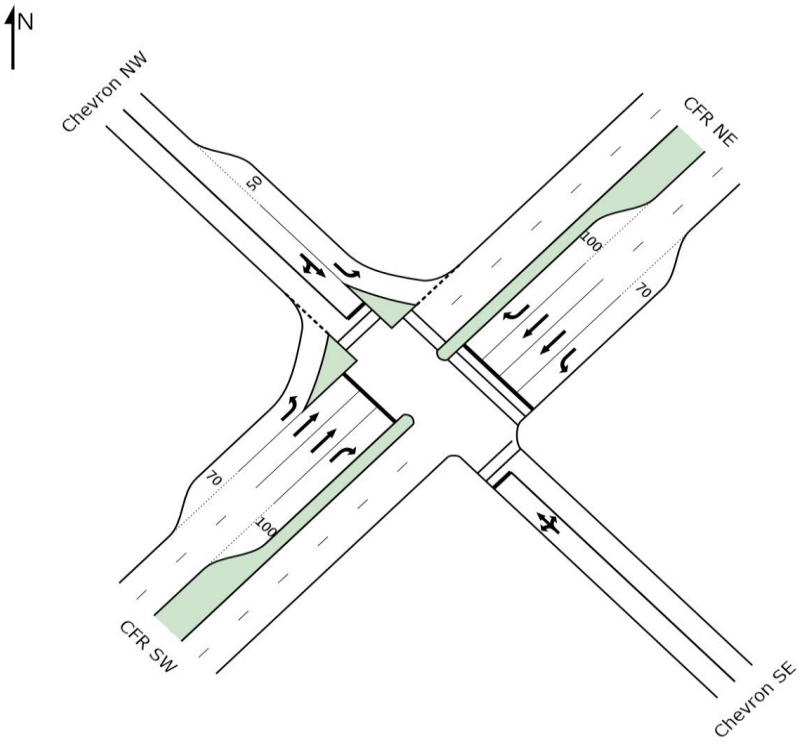
CFR NE

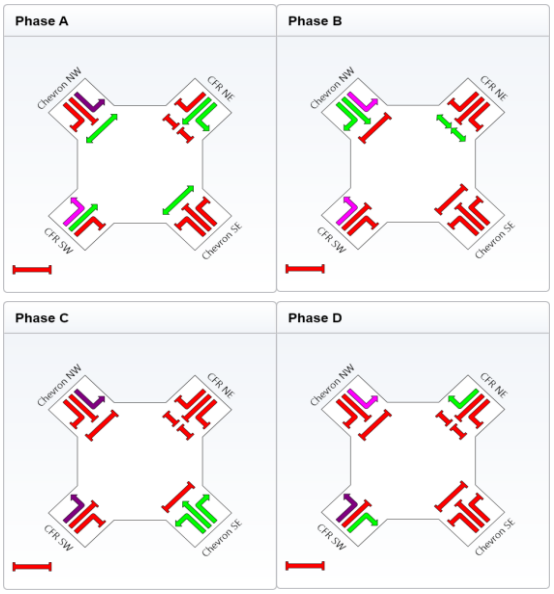
0	0	0	0	*0*	**LV***
0	0	0	0	*0*	**HV***
0	0	0	0	*0*	**Total Vol***
0.873	0.000	0.000	0.000	*0.000*	**DoS**
267.8	0	0	0	*0*	**95th %ile Back of Queue (m)**
24.6	0	0	0	*0*	**Average Delay (sec)**
Intersection	**L**	**T**	**R**	***App***	

***Output Volumes**

Chevron SE

Signals N:\WINDOWS\2015\CG150179\SIDRA\CG150179SID005.sip[CFChev Int PM]





Phase	Grn	Total	%
	48	54	54%
	16	22	22%
	6	12	12%
	6	12	12%
Cycle		100	sec

Chevron NW

	App	R	T	L
	0	0	0	0
	0	0	0	0
	0.000	0.000	0.000	0.000
	0	0	0	0
	0	0	0	0
	0	0	0	0

CFR SW

L	0	0	0.000	0	0	0				*0*	0	0	0.000	0	0	**App**
T	0	0	0.000	0	0	0				0	0	0	0.000	0	0	**R**
R	0	0	0.000	0	0	0				0	0	0	0.000	0	0	**T**
App	*0*	*0*	*0.000*	*0*	*0*	*0*				0	0	0	0.000	0	0	**L**

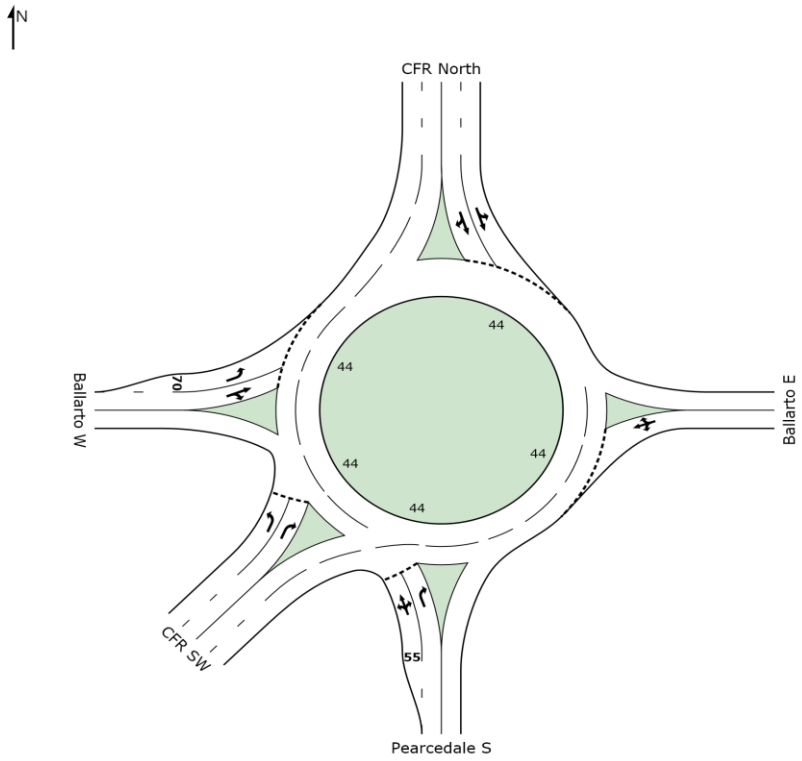
CFR NE

0	0	0	0	*0*	**LV***
0	0	0	0	*0*	**HV***
0	0	0	0	*0*	**Total Vol***
0.837	0.000	0.000	0.000	*0.000*	**DoS**
253	0	0	0	*0*	**95th %ile Back of Queue (m)**
26.6	0	0	0	*0*	**Average Delay (sec)**
Intersection	**L**	**T**	**R**	***App***	

***Output Volumes**

Chevron SE

Roundabout N:\WINDOWS\2015\CG150179\SIDRA\CG150179SID005.sip[CFBalPea Int AM]



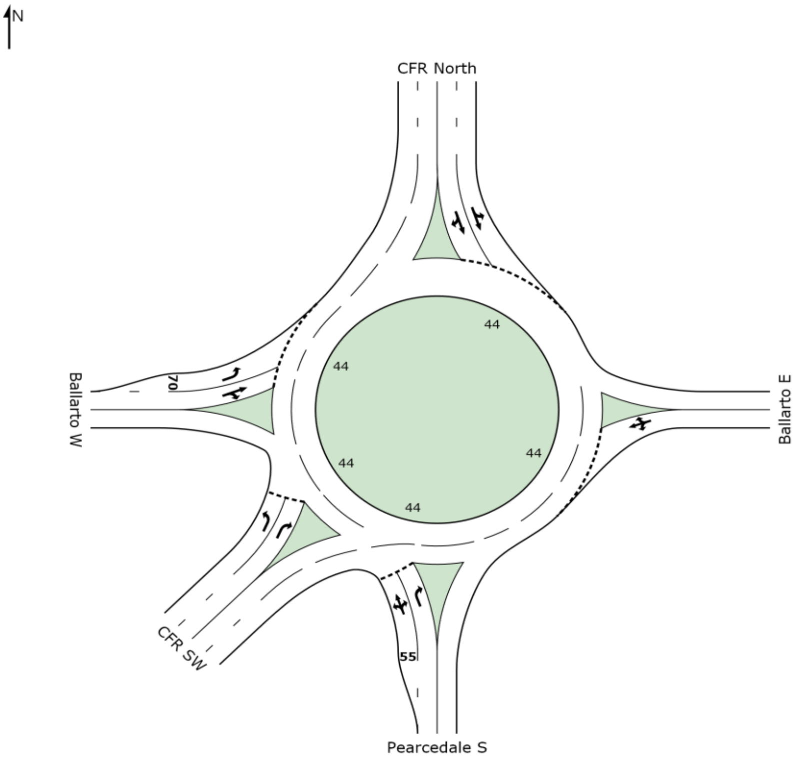
CFR North

						App	**R**	**T**	**L**						
						9	10.6	3.4	5.1						
						43	43	43	7.2						
						0.623	0.623	0.623	0.184						
						1350	1047	272	31						
						0	0	0	0						
Ballarto W						*1350*	1047	272	31					**Ballarto E**	
L	9.7	9.2	0.197	148	0	148				*59*	0	*59*	*0.098*	3.6	*11.4*	***App***
T	9.1	2.2	0.058	25	0	25				16	0	16	0.098	3.6	17.1	**R**
R	17.6	2.2	0.058	*5*	0	*5*				16	0	16	0.098	3.6	9	**T**
App	9.8	9.2	*0.197*	*178*	*0*	*178*				27	0	27	0.098	3.6	9.5	**L**
					1935		64	279	5	*348*		**LV***				
					0		0	0	0	*0*		**HV***				
					1935		64	279	5	*348*		**Total Vol***				
					0.661		0.493	0.493	0.011	*0.493*		**DoS**				
					46.5		32.8	32.8	0.4	*32.8*		**95th %ile Back of Queue (m)**				
					9		16	13.6	19.1	*14.2*		**Average Delay (sec)**				
					Intersection		**L**	**T**	**R**	***App***						

Pearcedale S

***Output Volumes**

Roundabout N:\WINDOWS\2015\CG150179\SIDRA\CG150179SID005.sip[CFBalPea Int PM]



CFR North

	App	R	T	L
Average Delay (sec)	*8.7*	10.5	3.3	5.1
95th %ile Back of Queue (m)	*37.3*	37.3	37.3	6.6
DoS	*0.580*	0.580	0.580	0.171
Total Vol*	*1274*	942	323	9
HV*	*0*	0	0	0
LV*	*1274*	942	323	9

Ballarto W

	Average Delay (sec)	95th %ile Back of Queue (m)	DoS	Total Vol*	HV*	LV*
L	8.2	5.6	0.131	116	0	116
T	7.6	1.3	0.037	18	0	18
R	16.2	1.3	0.037	4	0	4
App	*8.4*	*5.6*	*0.131*	*138*	*0*	*138*

Ballarto E

	LV*	HV*	Total Vol*	DoS	95th %ile Back of Queue (m)	Average Delay (sec)
App	*84*	*0*	*84*	*0.130*	*4.7*	9.9
R	14	0	14	0.130	4.7	16.6
T	24	0	24	0.130	4.7	8.5
L	46	0	46	0.130	4.7	8.7

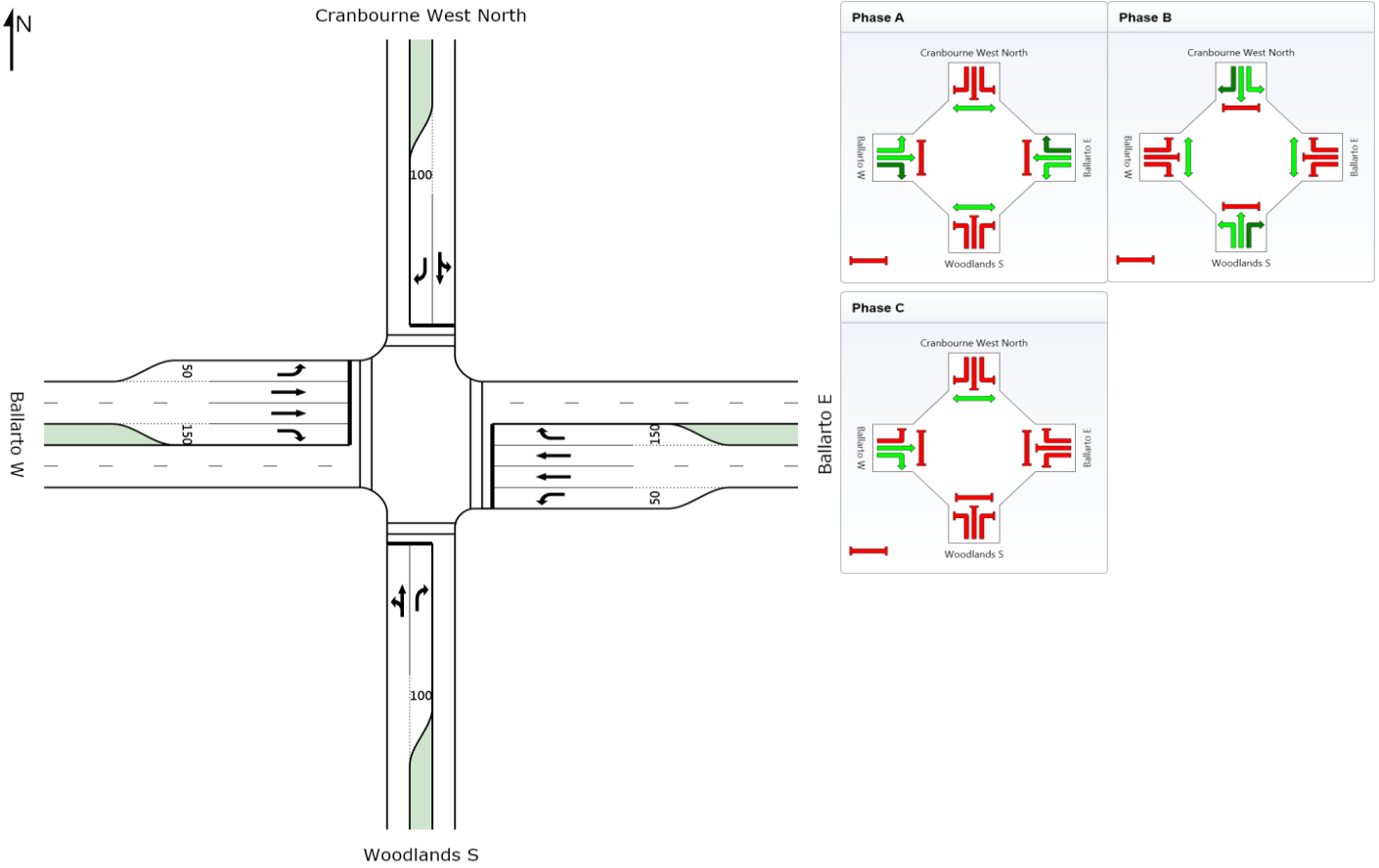
Pearcedale S

	Intersection	L	T	R	App
LV*	1679	29	148	6	*183*
HV*	0	0	0	0	*0*
Total Vol*	1679	29	148	6	*183*
DoS	0.594	0.225	0.225	0.012	*0.225*
95th %ile Back of Queue (m)	37.3	11.3	11.3	0.5	*11.3*
Average Delay (sec)	7.6	11.3	9	17.9	*9.7*

***Output Volumes**

Ballarto / Woodlands AM Ultimate

Signals N:\WINDOWS\2015\CG150179\SIDRA\CG150179SID005.sip[BalWoo Ult AM]



Phase	Grn	Total	%
	24	30	43%
	22	28	40%
	6	12	17%
Cycle		70	sec

Cranbourne West North

	App	R	T	L
	29.7	38.6	18.7	26.9
	14.2	11.9	14.2	14.2
	0.260	0.260	0.138	0.138
	135	53	29	53
	0	0	0	0
	135	53	29	53

Ballarto W

L	24.1	0.2	0.003	1	0	1	1198	0	1198	*0.852*	*150.2*	*30.2*	***App***
T	11.8	72.5	0.471	944	0	944	21	0	21	0.079	3.5	25.6	**R**
R	23.5	11.3	0.301	85	0	85	1139	0	1139	0.852	150.2	30.4	**T**
App	*12.7*	*72.5*	*0.471*	*1030*	*0*	*1030*	38	0	38	0.093	6.1	24.8	**L**

Ballarto E

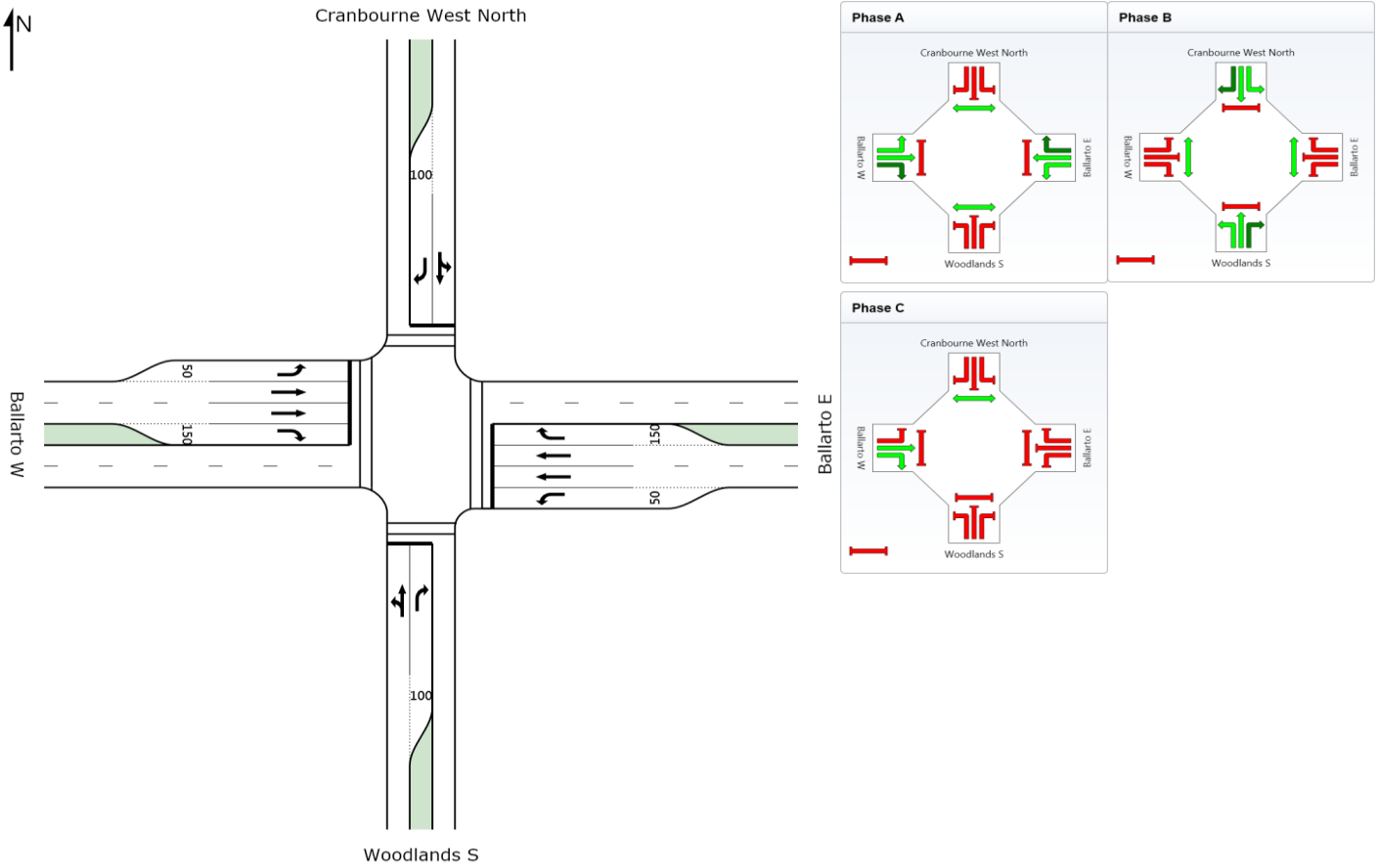
2894	337	43	151	*531*	**LV***
0	0	0	0	*0*	**HV***
2894	337	43	151	*531*	**Total Vol***
0.852	0.648	0.648	0.357	*0.648*	**DoS**
150.2	80	80	29.6	*80*	**95th %ile Back of Queue (m)**
23.9	30.9	22.7	30.1	*30*	**Average Delay (sec)**
Intersection	**L**	**T**	**R**	***App***	

***Output Volumes**

Woodlands S

Ballarto / Woodlands PM Ultimate

Signals N:\WINDOWS\2015\CG150179\SIDRA\CG150179SID005.sip[BalWoo Ult PM]



Phase	Grn	Total	%
	23	29	41%
	22	28	40%
	7	13	19%
Cycle		70	sec

Cranbourne West North

	App	R	T	L
	27	32.2	18.7	26.9
	14.8	10.5	14.8	14.8
	0.170	0.170	0.143	0.143
	139	53	33	53
	0	0	0	0
	139	53	33	53

Ballarto W

L	25.7	8.7	0.132	53	0	53	1070	0	1070	0.729	104.3	24.3	*App*
T	12.6	94.8	0.573	1148	0	1148	21	0	21	0.100	3.8	27.6	**R**
R	26.9	41.3	0.761	253	0	253	935	0	935	0.729	104.3	24	**T**
App	*15.6*	*94.8*	*0.761*	*1454*	*0*	*1454*	114	0	114	0.287	19.6	26.5	**L**

Ballarto E

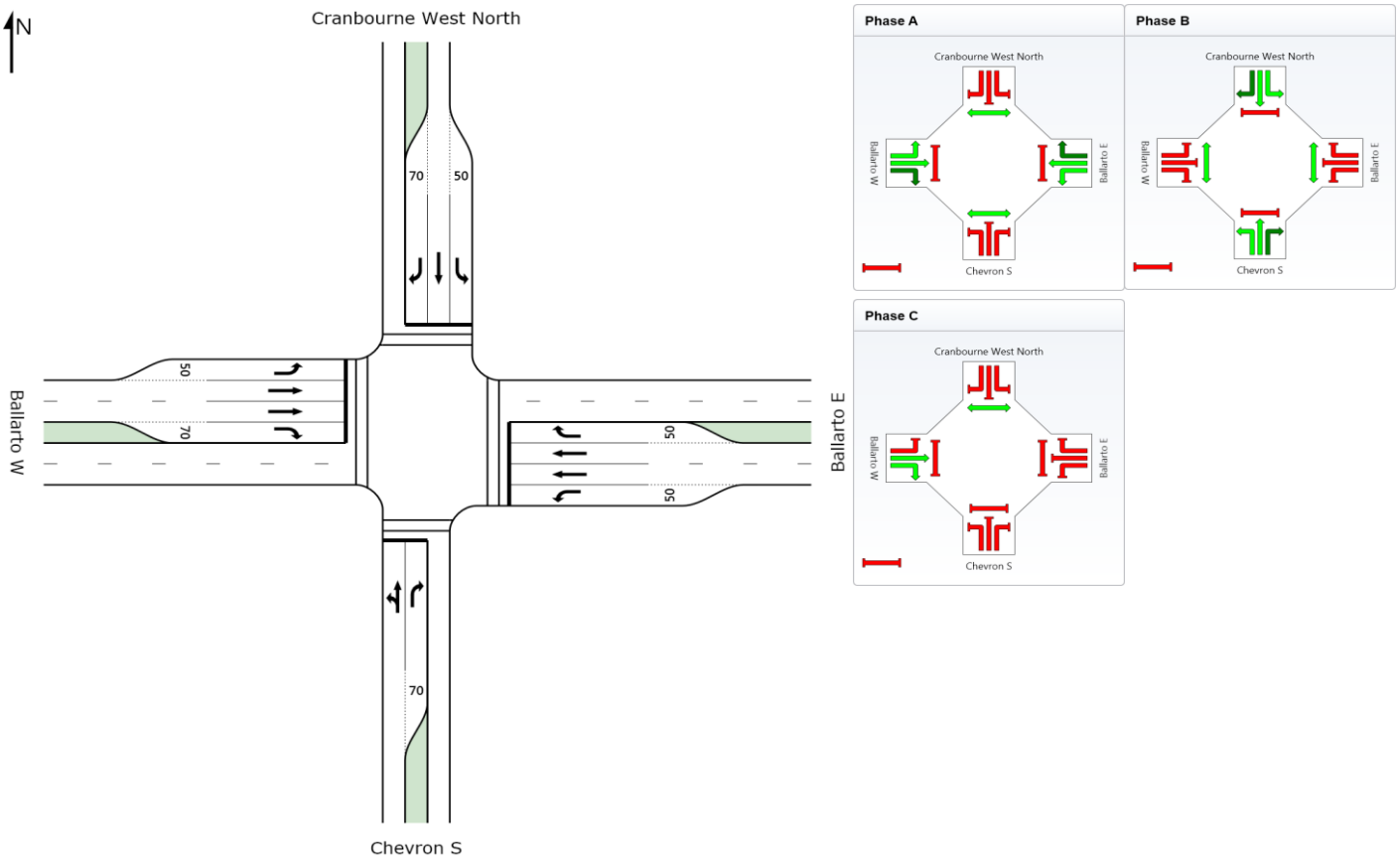
2976	169	57	87	*313*	**LV***
0	0	0	0	*0*	**HV***
2976	169	57	87	*313*	**Total Vol***
0.761	0.383	0.383	0.208	*0.383*	**DoS**
104.3	42.9	42.9	16.3	42.9	**95th %ile Back of Queue (m)**
20.5	28.7	20.5	29	27.3	**Average Delay (sec)**
Intersection	**L**	**T**	**R**	*App*	

***Output Volumes**

Woodlands S

Ballarto / Eastern Connector AM Ultimate

Signals N:\WINDOWS\2015\CG150179\SIDRA\CG150179SID005.sip[BalEC Ult AM]



Phase	Grn	Total	%
	24	30	43%
	22	28	40%
	6	12	17%
Cycle		70	sec

Cranbourne West North

	App	R	T	L
	23.8	29.5	18	26.1
	4.9	3.9	4.9	3.5
	0.057	0.057	0.048	0.054
	71	21	29	21
	0	0	0	0
	71	21	29	21

Ballarto W

L	24.6	3.3	0.052	21	0	21	1107	0	1107	*0.782*	*123*	*25.4*	***App***
T	11.9	75.6	0.486	975	0	975	21	0	21	0.083	3.6	25.6	**R**
R	23.1	16.2	0.403	120	0	120	1045	0	1045	0.782	123	25.4	**T**
App	*13.3*	*75.6*	*0.486*	*1116*	*0*	*1116*	41	0	41	0.101	6.6	24.8	**L**

Ballarto E

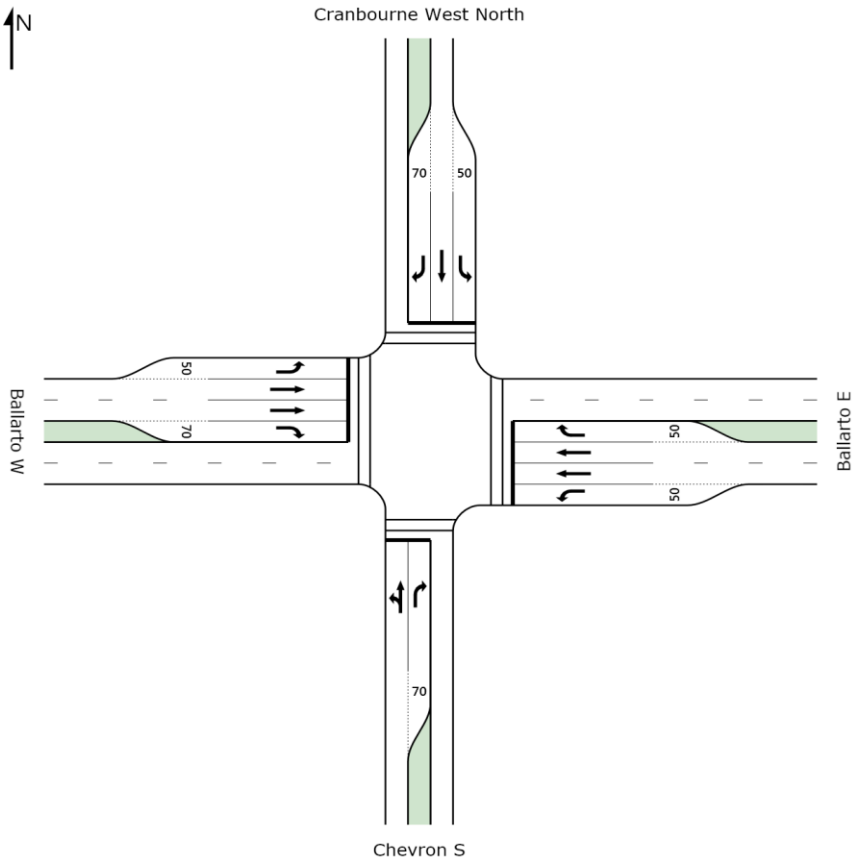
2486	132	16	44	*192*	**LV***
0	0	0	0	*0*	**HV***
2486	132	16	44	*192*	**Total Vol***
0.782	0.251	0.251	0.096	*0.251*	**DoS**
123	26.6	26.6	7.6	26.6	**95th %ile Back of Queue (m)**
20.1	27.7	19.5	26.6	26.8	**Average Delay (sec)**
Intersection	**L**	**T**	**R**	***App***	

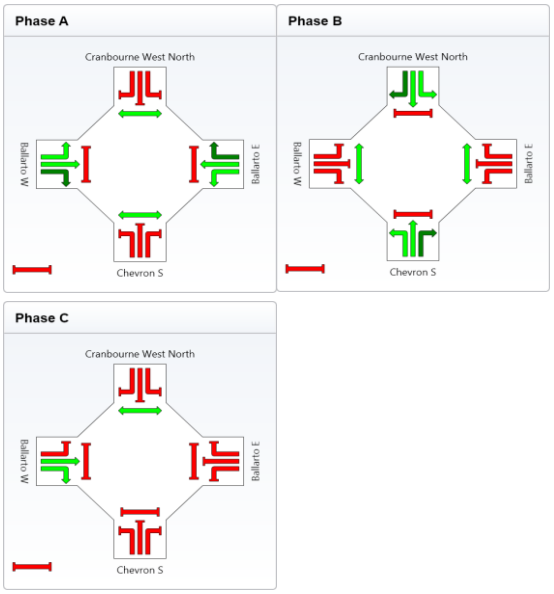
***Output Volumes**

Chevron S

Ballarto / Eastern connector PM Ultimate

Signals N:\WINDOWS\2015\CG150179\SIDRA\CG150179SID005.sip[BalEC Ult PM]





Phase	Grn	Total	%
	24	30	43%
	22	28	40%
	6	12	17%
Cycle		70	sec

Cranbourne West North

	App	R	T	L
	25.9	29.3	18.7	26.9
	14.8	9.8	14.8	14.8
	0.143	0.136	0.143	0.143
	139	53	33	53
	0	0	0	0
	139	53	33	53

Ballarto W

L	25	8.5	0.130	53	0	53	1006	0	1006	*0.701*	*100.5*	*22.6*	***App***
T	12.3	87.3	0.540	1083	0	1083	21	0	21	0.093	3.7	26.7	**R**
R	22.6	19.4	0.445	141	0	141	938	0	938	0.701	100.5	22.4	**T**
App	*14*	*87.3*	*0.540*	*1277*	*0*	*1277*	47	0	47	0.117	7.7	24.9	**L**

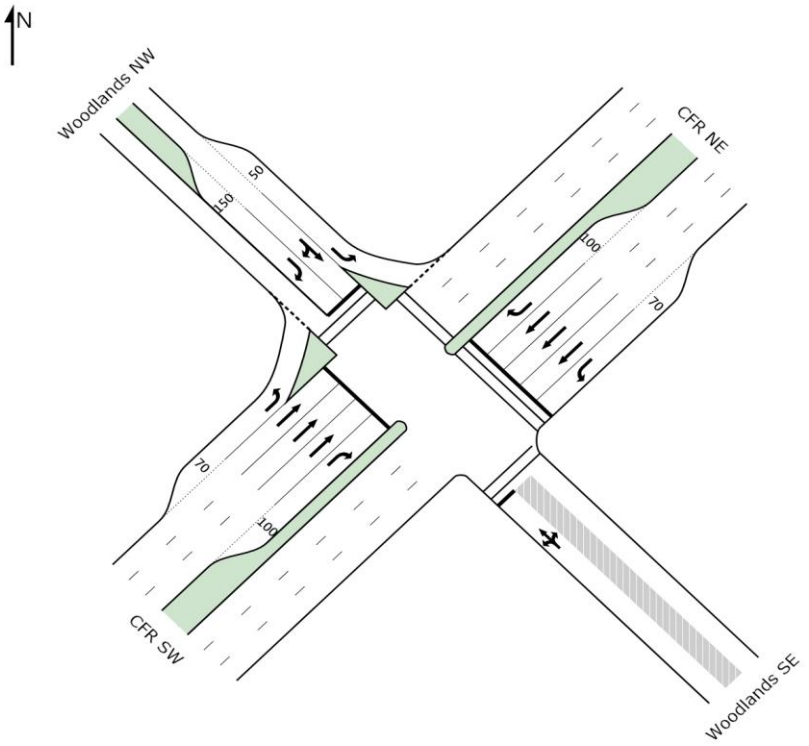
Ballarto E

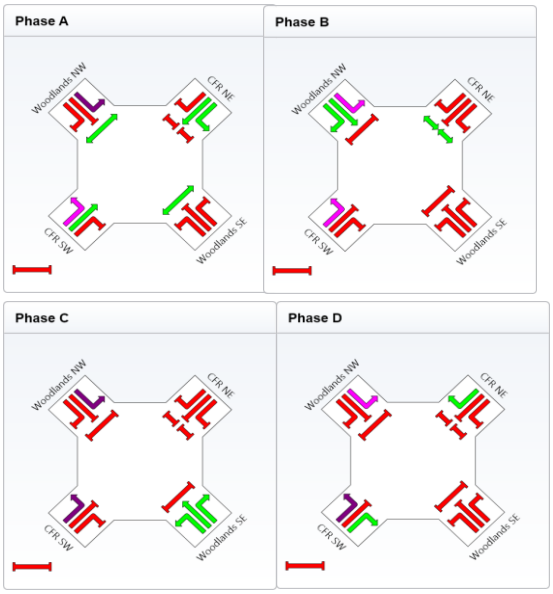
2585	111	14	38	*163*	**LV***
0	0	0	0	*0*	**HV***
2585	111	14	38	*163*	**Total Vol***
0.701	0.212	0.212	0.090	*0.212*	**DoS**
100.5	22.1	22.1	6.8	*22.1*	**95th %ile Back of Queue (m)**
18.8	27.4	19.2	28.1	26.9	**Average Delay (sec)**
Intersection	**L**	**T**	**R**	***App***	

***Output Volumes**

Chevron S

Signals N:\WINDOWS\2015\CG150179\SIDRA\CG150179SID005.sip[CFWoo Ult AM]





Phase	Grn	Total	%
	25	31	39%
	19	25	31%
	6	12	15%
	6	12	15%
Cycle		80	sec

Woodlands NW

				App	R	T	L							
				0	0	0	0							
				0	0	0	0							
				0.000	0.000	0.000	0.000							
				0	0	0	0							
				0	0	0	0							
				0	0	0	0							

CFR SW

L	0	0	0.000	0	0	0				*0*	0	0	0.000	0	0	***App***
T	0	0	0.000	0	0	0				0	0	0	0.000	0	0	**R**
R	0	0	0.000	0	0	0				0	0	0	0.000	0	0	**T**
App	*0*	*0*	*0.000*	*0*	*0*	*0*				0	0	0	0.000	0	0	**L**

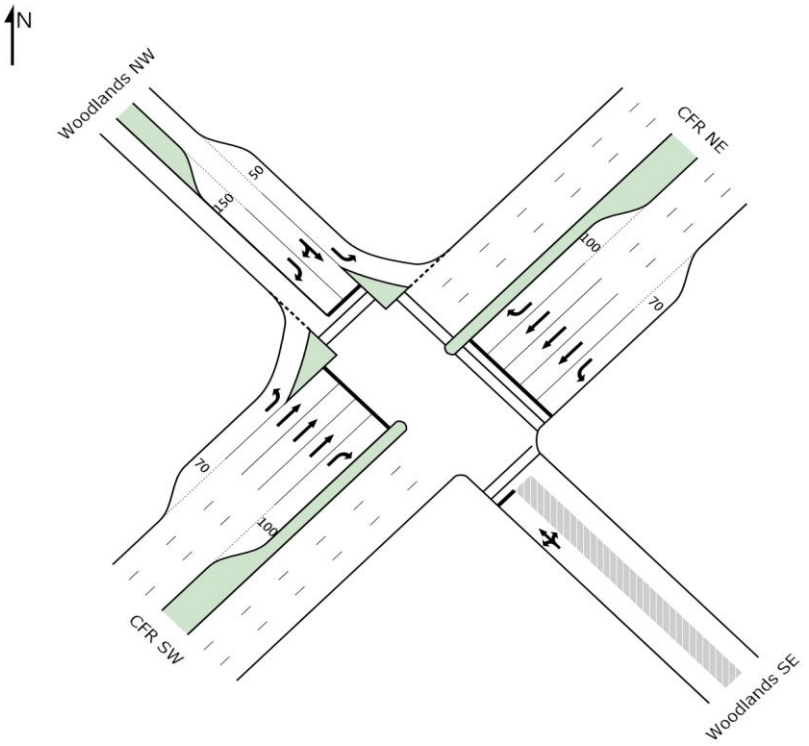
CFR NE

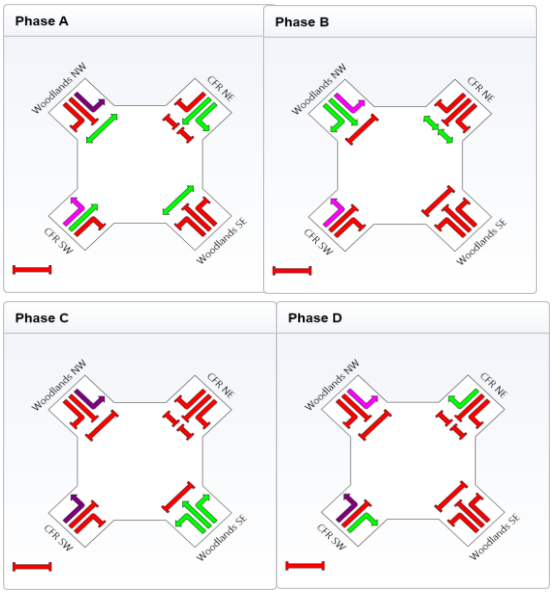
0	0	0	0	0		**LV***
0	0	0	0	0		**HV***
0	0	0	0	0		**Total Vol***
0.882	0.000	0.000	0.000	0.000		**DoS**
171.5	0	0	0	0		**95th %ile Back of Queue (m)**
33	0	0	0	0		**Average Delay (sec)**
Intersection	**L**	**T**	**R**	***App***		

***Output Volumes**

Woodlands SE

Signals N:\WINDOWS\2015\CG150179\SIDRA\CG150179SID005.sip[CFWoo Ult PM]





Phase	Grn	Total	%
	25	31	39%
	19	25	31%
	6	12	15%
	6	12	15%
Cycle		80	sec

Woodlands NW

	App	R	T	L
	0	0	0	0
	0	0	0	0
	0.000	0.000	0.000	0.000
	0	0	0	0
	0	0	0	0
	0	0	0	0

CFR SW

L	0	0	0.000	0	0	0	*0*	0	0	0	0.000	0	0	**App**
T	0	0	0.000	0	0	0	0	0	0	0	0.000	0	0	**R**
R	0	0	0.000	0	0	0	0	0	0	0	0.000	0	0	**T**
App	*0*	*0*	*0.000*	*0*	*0*	*0*	0	0	0	0	0.000	0	0	**L**

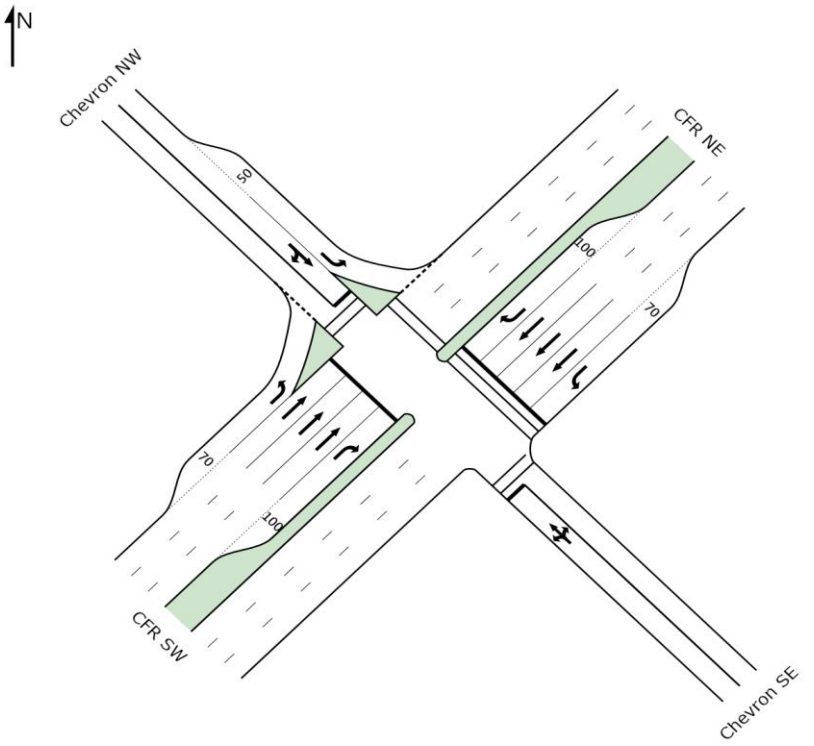
CFR NE

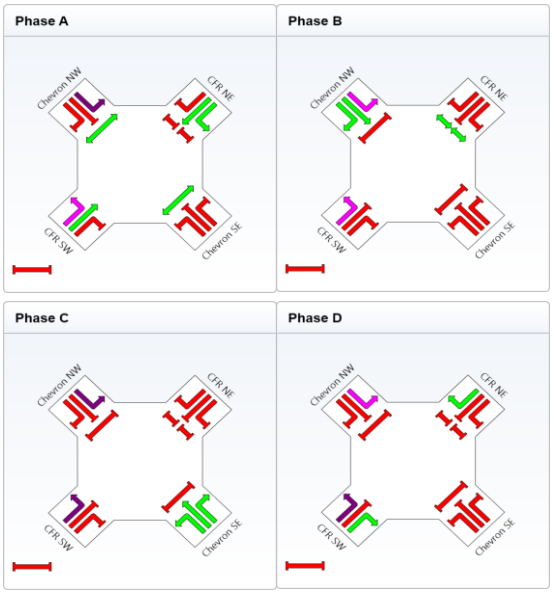
0	0	0	*0*	**LV***
0	0	0	*0*	**HV***
0	0	0	*0*	**Total Vol***
0.887	0.000	0.000	0.000	**DoS**
174.2	0	0	*0*	**95th %ile Back of Queue (m)**
32.3	0	0	*0*	**Average Delay (sec)**
Intersection	**L**	**T**	**R**	***App***

***Output Volumes**

Woodlands SE

Signals N:\WINDOWS\2015\CG150179\SIDRA\CG150179SID005.sip[CFChev Ult AM]





Phase	Grn	Total	%
	25	31	39%
	19	25	31%
	6	12	15%
	6	12	15%
Cycle		80	sec

Chevron NW

	App	R	T	L
	0	0	0	0
	0	0	0	0
	0.000	0.000	0.000	0.000
	0	0	0	0
	0	0	0	0
	0	0	0	0

CFR SW

L	0	0	0.000	0	0	0	*0*	0	0	0.000	0	0	**App**
T	0	0	0.000	0	0	0	0	0	0	0.000	0	0	**R**
R	0	0	0.000	0	0	0	0	0	0	0.000	0	0	**T**
App	*0*	*0*	*0.000*	*0*	*0*	*0*	0	0	0	0.000	0	0	**L**

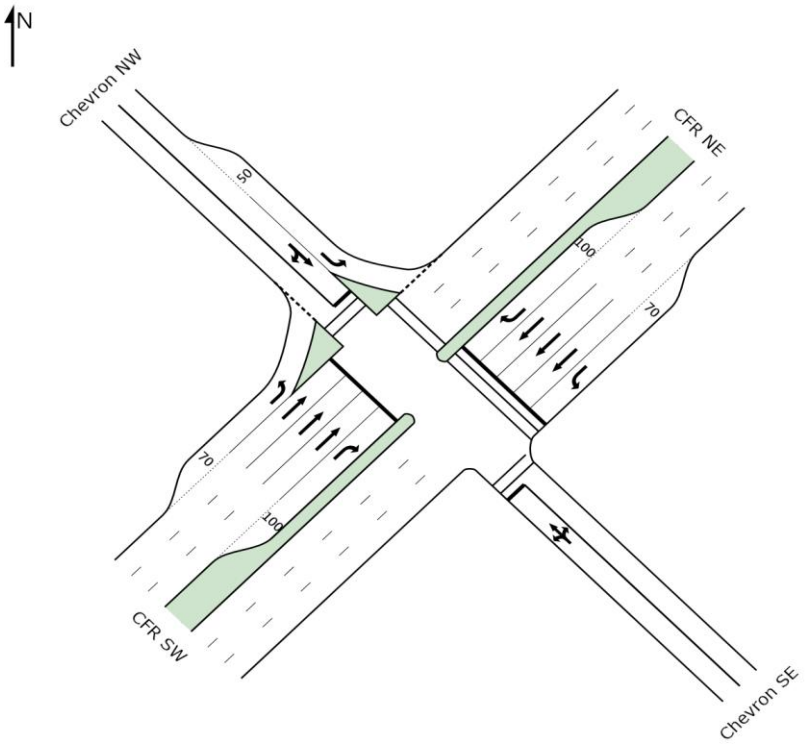
CFR NE

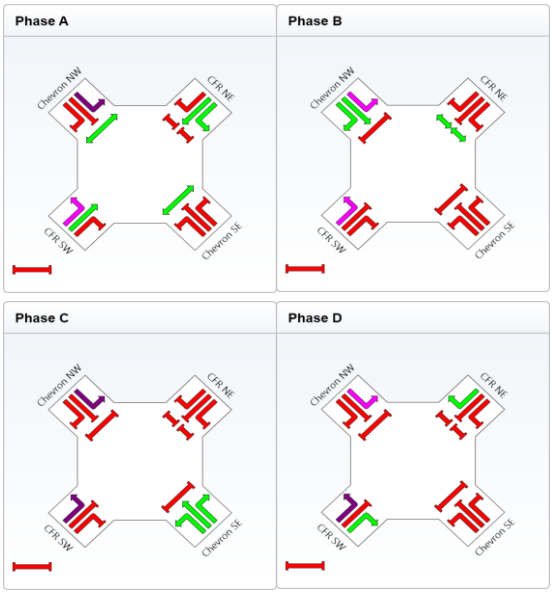
	0	0	0	0	**LV***
	0	0	0	0	**HV***
	0	0	0	0	**Total Vol***
0.834	0.000	0.000	0.000	*0.000*	**DoS**
148.5	0	0	0	0	**95th %ile Back of Queue (m)**
30.5	0	0	0	0	**Average Delay (sec)**
Intersection	**L**	**T**	**R**	***App***	

***Output Volumes**

Chevron SE

Signals N:\WINDOWS\2015\CG150179\SIDRA\CG150179SID005.sip[CFChev Ult PM]





Phase	Grn	Total	%
	25	31	39%
	19	25	31%
	6	12	15%
	6	12	15%
Cycle		80	sec

Chevron NW

		App	R	T	L
		0	0	0	0
		0	0	0	0
		0.000	0.000	0.000	0.000
		0	0	0	0
		0	0	0	0
		0	0	0	0

CFR SW

L	0	0	0.000	0	0	0				*0*	0	0	*0.000*	0	0	***App***
T	0	0	0.000	0	0	0				0	0	0	0.000	0	0	**R**
R	0	0	0.000	0	0	0				0	0	0	0.000	0	0	**T**
App	*0*	*0*	*0.000*	*0*	*0*	*0*				0	0	0	0.000	0	0	**L**

CFR NE

0	0	0	0	*0*	**LV***
0	0	0	0	*0*	**HV***
0	0	0	0	*0*	**Total Vol***
0.844	0.000	0.000	0.000	*0.000*	**DoS**
152.6	0	0	0	*0*	**95th %ile Back of Queue (m)**
30.5	0	0	0	*0*	**Average Delay (sec)**
Intersection	**L**	**T**	**R**	***App***	

***Output Volumes**

Chevron SE

Brompton Lodge PSP

APPENDIX

D

INTERSECTION AND ROAD PROJECT COSTINGS

Cardno
Shaping the Future

PRELIMINARY ESTIMATE
SUMMARY SHEET
CG150179
Brompton Lodge
V6
20/10/2015

ITEM	DESCRIPTION	IN-03	IN-04	IN-05	RD-01	TOTAL
A	Project and Program Management	$ 149,232.53	$ 105,189.78	$ 36,569.18	$ 162,418.09	$ 453,409.59
B	Design and Investigation	$ 298,465.07	$ 210,379.57	$ 73,138.37	$ 324,836.18	$ 906,819.18
C	Land Acquisition	$ -	$ -	$ -	$ -	$ -
D	Construction including Final Design	$ 2,984,650.65	$ 2,103,795.65	$ 731,383.68	$ 3,248,361.79	$ 9,068,191.77
	TOTAL A - D	$ 3,432,348.25	$ 2,419,365.00	$ 841,091.23	$ 3,735,616.06	$10,428,420.53
E	CONTINGENCY					
	Lower Bound Contingency (0% of D)	$ -	$ -	$ -	$ -	$ -
	Upper Bound Contingency (20% of D)	$ 596,930.13	$ 420,759.13	$ 146,276.74	$ 649,672.36	$ 1,813,638.35
F	PROJECT BUDGET					
	Total Lower Bound Estimate	$ 3,432,348.25	$ 2,419,365.00	$ 841,091.23	$ 3,735,616.06	$10,428,420.53
	Total Upper Bound Estimate	$ 4,029,278.38	$ 2,840,124.13	$ 987,367.96	$ 4,385,288.42	$12,242,058.89
G	Project Budget (75% confidence)	$ 3,880,045.85	$ 2,734,934.35	$ 950,798.78	$ 4,222,870.33	$11,788,649.30

AUTHOR: ASIRI RAJAPAKSE *Date:* 20/10/2015
REVIEWER: ROB HENRY *Date:*

PRELIMINARY ESTIMATE **20 October 2015**
CG150179
Brompton Lodge **PM %:** 10.00%
IN-03

ITEM	DESCRIPTION	QUANTITY	UNIT	RATE	AMOUNT	SUBTOTAL
A	**Project and Program Management**					**$ 149,233**
	Project Management		3.00%	3.00%	$ 89,540	
	Project scoping, planning, scheduling, monitoring, reporting and commissioning				$ -	
	Management of preconstruction activities, development of tender documents and management of contracts				$ -	
	Managing external interfaces, including community liaison, environmental issues, traffic issues etc				$ -	
	Records management				$ -	
	Program Administration		2.00%	2.00%	$ 59,693	
B	**Design and Investigation**					**$ 298,465**
	Traffic Investigations		0.85%	0.85%	$ 25,370	
	Cadastral and Engineering Survey		1.20%	1.20%	$ 35,816	
	Geotechnical investigations Pavement Investigations and Design		1.20%	1.20%	$ 35,816	
	Environmental Investigations			0.00%	$ -	
	Landscape Design			0.00%	$ -	
	Preliminary and Final Design		4.25%	4.25%	$ 126,848	
	Construction Management		2.50%	2.50%	$ 74,616	
C	**Land Acquisition**					**$ -**
	Acquire land				$ -	
D	**Construction**				$ 2,984,651	**$ 2,984,651**
1	**PRELIMINARIES**					$ 173,000
1.1	Site Establishment	1	item	$ 68,000.00	$ 68,000	
1.2	Site Management & supervision including QA	18	wks	$ 2,500.00	$ 45,000	
1.3	Provision for traffic	1	item	$ 60,000.00	$ 60,000	
2	**DEMOLITION**					$ 64,475
2.1	Kerb and channel	512	m	$ 45.00	$ 23,040	
2.2	Existing granatic sand footpath	75	m	$ 6.00	$ 450	
2.3	Trees	12	No	$ 1,000.00	$ 12,000	
2.4	Steel guard rails	80	m	$ 10.00	$ 800	
2.5	High tension wire guard rails	423	m	$ 15.00	$ 6,345	
2.6	Concrete island	268	m²	$ 65.00	$ 17,420	
2.7	Redundant concrete bus bay	68	m²	$ 65.00	$ 4,420	
3	**EARTHWORKS**					$ 189,390
3.1	Stripping topsoil (150mm)	12253	m²	$ 6.00	$ 73,517	
3.2	Excavation and removal (inc. reclamation of FCR)	2575	m³	$ 30.00	$ 77,249	
3.3	Soft Spot Rectification (reclaimed FCR)	2575	m²	$ 15.00	$ 38,624	
4	**PAVEMENT**					$ 892,616
4.1	Deep lift asphalt 195 mm	4501	m²	$ 120.00	$ 540,120	
4.2	Subbase course - 250 mm 3% CTCR	5150	m²	$ 45.00	$ 231,746	
4.3	Asphalt resheet	3450	m²	$ 35.00	$ 120,750	
5	**DRAINAGE**					$ 326,095
5.1	subsoil drains 100mm dia - screenings	1041	m	$ 45.00	$ 46,845	
5.2	subsoil drains 100mm dia - no fines conc	380	m	$ 50.00	$ 19,000	
5.3	375 RCP (Class 2)	1041	m	$ 200.00	$ 208,200	
5.4	drainage pit	18	No	$ 2,500.00	$ 44,550	
5.5	modify existing drainage pit	3	No	$ 2,500.00	$ 7,500	
6	**CONCRETE WORKS**					$ 452,965
6.1	Kerb &channel	1442	m	$ 60.00	$ 86,520	
6.2	1.5m wide footpath	233	m	$ 65.00	$ 15,145	
6.3	3m shared path (trafficable)	2760	m²	$ 100.00	$ 276,000	
6.4	Concrete island infill	683	m²	$ 100.00	$ 68,300	
6.5	Bus shelter slab	2	No	$ 3,500.00	$ 7,000	
7	**LANDSCAPING WORKS**					$ 31,110
7.1	Topsoiling seeding	3660	m²	$ 8.50	$ 31,110.00	
8	**SIGNING**	1	item	$ 7,000	$ 7,000	$ 7,000
9	**LINEMARKING (Thermoplastic) inc Bus lane treatment**	1	item	$ 25,000	$ 25,000	$ 25,000
10	**SERVICE RELOCATION**					$ 270,000
10.1	Overhead electrical	1	item	$ 150,000.00	$ 150,000	
10.2	Gas	1	item	$ 60,000.00	$ 60,000	
10.3	Water	1	item	$ 60,000.00	$ 60,000	
11	**TRAFFIC SIGNAL**					$ 402,000
11.1	10 year VicRoads maintenance	1	Item	$ 100,000	$ 100,000	
11.2	General items	1	Item	$ 27,500	$ 27,500	
11.3	Conduits	1	Item	$ 28,000	$ 28,000	
11.4	Pedestals	1	Item	$ 65,000	$ 65,000	
11.5	Lanterns	1	Item	$ 25,000	$ 25,000	
11.6	Controller	1	Item	$ 82,500	$ 82,500	
11.7	Detectors	1	Item	$ 15,000	$ 15,000	
11.8	Cabling & connections	1	Item	$ 48,000	$ 48,000	
11.9	Clean-up	1	Item	$ 11,000	$ 11,000	
12	**POWER & LIGHTING /Relocation**					$ 151,000
12.1	O/H Powerlines Relocation	1	No	$ 8,000.00	$ 8,000	
12.2	power pole relocation (HV & LV)	1	No	$ 12,000.00	$ 12,000	
11.3	JUP lighting single	2	No	$ 4,000	$ 8,000	
12.4	New light pole - single	7	No	$ 8,000.00	$ 56,000	
12.5	New light pole - double	2	No	$ 6,000.00	$ 12,000	
12.6	conduits and pits	1	item	$ 25,000.00	$ 25,000	
12.7	Electrical connection	1	item	$ 30,000.00	$ 30,000	
13	**MISCELLANEOUS**					$ -
13.1	Driveway crossings		not included		$ -	
13,2	Conduits		not included		$ -	
14	**PROVISIONAL SUM - DAYWORK**		item		$ -	$ -
	TOTAL A - D				$ 3,432,348	**$ 3,432,348**
E	**Contingency**					
	Lower Bound Contingency (0% of D)				0%	$ -
	Upper Bound Contingency (20% of D)				20%	$ 596,930.13
F	**PROJECT BUDGET**					
	Lower Bound Estimate					$ 3,432,348
	Upper Bound Estimate					$ 4,029,278
G	**Project Budget (75% Confidence)**					**$ 3,880,046**

Comments Estimate does not include reinstatement of high tension wire guard rail

PRELIMINARY ESTIMATE **20 October 2015**
CG150179
Brompton Lodge **PM %:** 10.00%
IN-04

ITEM	DESCRIPTION	QUANTITY	UNIT	RATE	AMOUNT	SUBTOTAL
A	**Project and Program Management**					**$ 105,190**
	Project Management		3.00%	3.00%	$ 63,114	
	Project scoping, planning, scheduling, monitoring, reporting and commissioning				$ -	
	Management of preconstruction activities, development of tender documents and management of contracts				$ -	
	Managing external interfaces, including community liaison, environmental issues, traffic issues etc				$ -	
	Records management				$ -	
	Program Administration		2.00%	2.00%	$ 42,076	
B	**Design and Investigation**					**$ 210,380**
	Traffic Investigations		0.85%	0.85%	$ 17,882	
	Cadastral and Engineering Survey		1.20%	1.20%	$ 25,246	
	Geotechnical investigations Pavement Investigations and Design		1.20%	1.20%	$ 25,246	
	Environmental Investigations			0.00%	$ -	
	Landscape Design			0.00%	$ -	
	Preliminary and Final Design		4.25%	4.25%	$ 89,411	
	Construction Management		2.50%	2.50%	$ 52,595	
C	**Land Acquisition**					**$ -**
	Acquire land				$ -	
D	**Construction**				$ 2,103,796	**$ 2,103,796**
1	**PRELIMINARIES**					$ 145,000
1.1	Site Establishment	1	item	$ 45,000.00	$ 45,000	
1.2	Site Management & supervision including QA	16	wks	$ 2,500.00	$ 40,000	
1.3	Provision for traffic	1	item	$ 60,000.00	$ 60,000	
2	**DEMOLITION**					$ 73,470
2.1	Kerb and channel	512	m	$ 45.00	$ 23,040	
2.3	Trees	15	No	$ 1,000.00	$ 15,000	
2.4	Concrete guard rail	1	Item	$ 10,000.00	$ 10,000	
2.5	High tension wire guard rails	391	m	$ 15.00	$ 5,865	
2.6	Concrete island	216	m²	$ 65.00	$ 14,040	
2.7	Redundant concrete bus bay	85	m²	$ 65.00	$ 5,525	
3	**EARTHWORKS**					$ 93,734
3.1	Stripping topsoil (150mm)	7414	m²	$ 6.00	$ 44,483	
3.2	Excavation and removal (inc. reclamation of FCR)	1094	m³	$ 30.00	$ 32,834	
3.3	Soft Spot Rectification (reclaimed FCR)	1094	m²	$ 15.00	$ 16,417	
4	**PAVEMENT**					$ 471,879
4.1	Deep lift asphalt 195 mm	1630	m²	$ 135.00	$ 220,050	
4.2	Subbase course - 250 mm 3% CTCR	2189	m²	$ 65.00	$ 142,279	
4.3	Asphalt resheet	3130	m²	$ 35.00	$ 109,550	
5	**DRAINAGE**					$ 151,360
5.1	subsoil drains 100mm dia - screenings	448	m	$ 45.00	$ 20,160	
5.2	subsoil drains 100mm dia - no fines conc	384	m	$ 50.00	$ 19,200	
5.3	375 RCP (Class 2)	448	m	$ 200.00	$ 89,600	
5.4	drainage pit	6	No	$ 2,500.00	$ 14,900	
5.5	modify existing drainage pit	3	No	$ 2,500.00	$ 7,500	
6	**CONCRETE WORKS**					$ 264,850
6.1	Kerb &channel	1242	m	$ 60.00	$ 74,520	
6.2	1.5m wide footpath	122	m	$ 65.00	$ 7,930	
6.3	3m shared path (trafficable)	1707	m²	$ 100.00	$ 170,700	
6.4	Concrete island infill	47	m²	$ 100.00	$ 4,700	
6.5	Bus shelter slab	2	No	$ 3,500.00	$ 7,000	
7	**LANDSCAPING WORKS**					$ 29,504
7.1	Topsoiling seeding	3471	m²	$ 8.50	$ 29,503.50	
8	**SIGNING**	1	item	$ 7,000	$ 7,000	$ 7,000
9	**LINEMARKING (Thermoplastic) inc Bus lane treatment**	1	item	$ 20,000	$ 20,000	$ 20,000
10	**SERVICE RELOCATION**					$ 310,000
10.1	Overhead electrical	1	item	$ 100,000.00	$ 100,000	
10.2	Gas	1	item	$ 150,000.00	$ 150,000	
10.3	Telecom	1	item	$ 60,000.00	$ 60,000	
11	**TRAFFIC SIGNAL**		item			$ 402,000
11.1	10 year VicRoads maintenance	1	Item	$ 100,000	$ 100,000	
11.2	General items	1	Item	$ 27,500	$ 27,500	
11.3	Conduits	1	Item	$ 28,000	$ 28,000	
11.4	Pedestals	1	Item	$ 65,000	$ 65,000	
11.5	Lanterns	1	Item	$ 25,000	$ 25,000	
11.6	Controller	1	Item	$ 82,500	$ 82,500	
11.7	Detectors	1	Item	$ 15,000	$ 15,000	
11.8	Cabling & connections	1	Item	$ 48,000	$ 48,000	
11.9	Clean-up	1	Item	$ 11,000	$ 11,000	
12	**POWER & LIGHTING /Relocation**					$ 135,000
12.1	O/H Powerlines Relocation	1	No	$ 8,000.00	$ 8,000	
12.2	power pole relocation (HV & LV)	1	No	$ 12,000.00	$ 12,000	
12.3	JUP lighting single	2	No	$ 4,000	$ 8,000	
12.4	New light pole - single	5	No	$ 8,000.00	$ 40,000	
12.5	New light pole - double	2	No	$ 6,000.00	$ 12,000	
12.6	conduits and pits	1	item	$ 25,000.00	$ 25,000	
12.7	Electrical connection	1	item	$ 30,000.00	$ 30,000	
13	**MISCELLANEOUS**					$ -
13.1	Driveway crossings		not included		$ -	
13.2	Conduits		not included		$ -	
14	**PROVISIONAL SUM - DAYWORK**		item		$ -	$ -
	TOTAL A - D				$ 2,419,365	**$ 2,419,365**
E	**Contingency**					
	Lower Bound Contingency (0% of D)				0%	$ -
	Upper Bound Contingency (20% of D)				20%	$ 420,759.13
F	**PROJECT BUDGET**					
	Lower Bound Estimate					$ 2,419,365
	Upper Bound Estimate					$ 2,840,124
G	**Project Budget (75% Confidence)**					**$ 2,734,934**

Comments Estimate does not include reinstatement of high tension wire guard rail

PRELIMINARY ESTIMATE **20 October 2015**
CG150179
Brompton Lodge **PM %:** 10.00%
IN-05

ITEM	DESCRIPTION	QUANTITY	UNIT	RATE	AMOUNT	SUBTOTAL
A	**Project and Program Management**					**$ 36,569**
	Project Management		3.00%	3.00%	$ 21,942	
	Project scoping, planning, scheduling, monitoring, reporting and commissioning				$ -	
	Management of preconstruction activities, development of tender documents and management of contracts				$ -	
	Managing external interfaces, including community liaison, environmental issues, traffic issues etc				$ -	
	Records management				$ -	
	Program Administration		2.00%	2.00%	$ 14,628	
B	**Design and Investigation**					**$ 73,138**
	Traffic Investigations		0.85%	0.85%	$ 6,217	
	Cadastral and Engineering Survey		1.20%	1.20%	$ 8,777	
	Geotechnical investigations Pavement Investigations and Design		1.20%	1.20%	$ 8,777	
	Environmental Investigations			0.00%	$ -	
	Landscape Design			0.00%	$ -	
	Preliminary and Final Design		4.25%	4.25%	$ 31,084	
	Construction Management		2.50%	2.50%	$ 18,285	
C	**Land Acquisition**					**$ -**
	Acquire land				$ -	
D	**Construction**				$ 731,384	**$ 731,384**
1	**PRELIMINARIES**					$ 113,000
1.1	Site Establishment	1	item	$ 18,000.00	$ 18,000	
1.2	Site Management & supervision including QA	14	wks	$ 2,500.00	$ 35,000	
1.3	Provision for traffic	1	item	$ 60,000.00	$ 60,000	
2	**DEMOLITION**					$ 12,000
2.1	Trees	12	No	$ 1,000.00	$ 12,000	
3	**EARTHWORKS**					$ 50,529
3.1	Stripping topsoil (150mm)	3105	m²	$ 6.00	$ 18,630	
3.2	Excavation and removal (inc. reclamation of FCR)	576	m³	$ 30.00	$ 17,266	
3.3	Asphalt planing	1	item	$ 6,000.00	$ 6,000	
3.4	Soft Spot Rectification (reclaimed FCR)	576	m²	$ 15.00	$ 8,633	
4	**PAVEMENT**					$ 216,483
4.1	Deep lift asphalt 195 mm	1039	m²	$ 135.00	$ 140,265	
4.2	Subbase course - 250 mm 3% CTCR	1151	m²	$ 65.00	$ 74,818	
4.3	Asphalt resheet	40	m²	$ 35.00	$ 1,400	
5	**DRAINAGE**					$ 59,285
5.1	subsoil drains 100mm dia - screenings	193	m	$ 45.00	$ 8,685	
5.2	subsoil drains 100mm dia - no fines conc	40	m	$ 50.00	$ 2,000	
5.3	375 RCP (Class 2)	193	m	$ 200.00	$ 38,600	
5.4	drainage pit	4	No	$ 2,500.00	$ 10,000	
6	**CONCRETE WORKS**					$ 117,440
6.1	Kerb &channel	249	m	$ 60.00	$ 14,940	
6.2	1.5m wide footpath	0	m	$ 65.00	$ -	
6.3	3m shared path (trafficable)	915	m²	$ 100.00	$ 91,500	
6.4	Concrete island infill	110	m²	$ 100.00	$ 11,000	
7	**LANDSCAPING WORKS**					$ 7,897
7.1	Topsoiling seeding	929	m²	$ 8.50	$ 7,896.50	
8	**SIGNING**	1	item	$ 3,000	$ 3,000	$ 3,000
9	**LINEMARKING (Thermoplastic)**	1	item	$ 15,000	$ 15,000	$ 15,000
10	**SERVICE RELOCATION**					$ -
10.1	(Water, Gas, Telstra) NOT INCLUDED IN EST		not included		$ -	
10.2	hydrant relocated		item		$ -	
11	**PEDESTRIAN OPERATED TRAFFIC SIGNAL**		item			$ 71,750
11.1	General items	1	Item	$ 6,875	$ 6,875	
11.2	Conduits	1	Item	$ 7,000	$ 7,000	
11.3	Pedestals	1	Item	$ 16,250	$ 16,250	
11.4	Lanterns	1	Item	$ 6,250	$ 6,250	
11.5	Controller	1	Item	$ 20,625	$ 20,625	
11.6	Cabling & connections	1	Item	$ 12,000	$ 12,000	
11.7	Clean-up	1	Item	$ 2,750	$ 2,750	
12	**POWER & LIGHTING /Relocation**					$ 65,000
12.1	JUP lighting single	2	No	$ 4,000	$ 8,000	
12.2	New light pole - single	2	No	$ 8,000.00	$ 16,000	
12.3	New light pole - double	1	No	$ 6,000.00	$ 6,000	
12.4	conduits and pits	1	item	$ 15,000.00	$ 15,000	
12.5	Electrical connection	1	item	$ 20,000.00	$ 20,000	
13	**MISCELLANEOUS**					$ -
13.1	Driveway crossings		not included		$ -	
13.2	Conduits		not included		$ -	
14	**PROVISIONAL SUM - DAYWORK**		item		$ -	$ -
	TOTAL A - D				$ 841,091	**$ 841,091**
E	**Contingency**					
	Lower Bound Contingency (0% of D)				0%	$ -
	Upper Bound Contingency (20% of D)				20%	$ 146,276.74
F	**PROJECT BUDGET**					
	Lower Bound Estimate					$ 841,091
	Upper Bound Estimate					$ 987,368
G	**Project Budget (75% Confidence)**					**$ 950,799**

Comments

PRELIMINARY ESTIMATE **20 October 2015**
CG150179
Brompton Lodge **PM %:** 10.00%
RD-01

ITEM	DESCRIPTION	QUANTITY	UNIT	RATE	AMOUNT	SUBTOTAL
A	**Project and Program Management**					**$ 162,418**
	Project Management		3.00%	3.00%	$ 97,451	
	Project scoping, planning, scheduling, monitoring, reporting and commissioning				$ -	
	Management of preconstruction activities, development of tender documents and management of contracts				$ -	
	Managing external interfaces, including community liaison, environmental issues, traffic issues etc				$ -	
	Records management				$ -	
	Program Administration		2.00%	2.00%	$ 64,967	
B	**Design and Investigation**					**$ 324,836**
	Traffic Investigations		0.85%	0.85%	$ 27,611	
	Cadastral and Engineering Survey		1.20%	1.20%	$ 38,980	
	Geotechnical investigations Pavement Investigations and Design		1.20%	1.20%	$ 38,980	
	Environmental Investigations			0.00%	$ -	
	Landscape Design			0.00%	$ -	
	Preliminary and Final Design		4.25%	4.25%	$ 138,055	
	Construction Management		2.50%	2.50%	$ 81,209	
C	**Land Acquisition**					**$ -**
	Acquire land				$ -	
D	**Construction**				$ 3,248,362	**$ 3,248,362**
1	**PRELIMINARIES**					$ 177,000
1.1	Site Establishment	1	item	$ 82,000.00	$ 82,000	
1.2	Site Management & supervision including QA	22	wks	$ 2,500.00	$ 55,000	
1.3	Provision for traffic	1	item	$ 40,000.00	$ 40,000	
2	**DEMOLITION**					$ 35,000
2.1	Trees	35	No	$ 1,000.00	$ 35,000	
3	**EARTHWORKS**					$ 236,181
3.1	Stripping topsoil (150mm)	7719	m²	$ 6.00	$ 46,314	
3.2	Excavation and removal (inc. reclamation of FCR)	4219	m³	$ 30.00	$ 126,578	
3.3	Soft Spot Rectification (reclaimed FCR)	4219	m²	$ 15.00	$ 63,289	
4	**PAVEMENT**					$ 1,306,015
4.1	Deep lift asphalt 195 mm	7719	m²	$ 120.00	$ 926,280	
4.2	Subbase course - 250 mm 3% CTCR	8439	m²	$ 45.00	$ 379,735	
5	**DRAINAGE**					$ 472,955
5.1	subsoil drains 100mm dia - screenings	1599	m	$ 45.00	$ 71,955	
5.2	subsoil drains 100mm dia - no fines conc	25	m	$ 50.00	$ 1,250	
5.3	375 RCP (Class 2)	1599	m	$ 200.00	$ 319,800	
5.4	drainage pit	32	No	$ 2,500.00	$ 79,950	
6	**CONCRETE WORKS**					$ 731,340
6.1	Kerb &channel	1599	m	$ 60.00	$ 95,940	
6.2	3m wide shared footpath (Northern side)	3189	m²	$ 100.00	$ 318,900	
6.3	3m wide shared footpath (Southern side)	3165	m²	$ 100.00	$ 316,500	
6.4	Concrete island infill	0	m²	$ 100.00	$ -	
7	**LANDSCAPING WORKS**					$ 34,204
7.1	Topsoiling seeding	4024	m²	$ 8.50	$ 34,204	
8	**SIGNING**	1	item	$ 12,000	$ 12,000	$ 12,000
9	**LINEMARKING (Thermoplastic)**	1	item	$ 35,000	$ 35,000	$ 35,000
10	**SERVICE RELOCATION**					$ -
10.1	(Water, Gas, Telstra) NOT INCLUDED IN EST		not included		$ -	
10.2	hydrant relocated		item		$ -	
11	**POWER & LIGHTING /Relocation**					$ 208,667
11.1	Light pole (1-way) and luminous lights	12	No	$ 8,000	$ 98,667	
11.2	Light pole (2-way) and luminous lights	0	No	$ 9,000	$ -	
11.3	Cabling, conduits and pits	1	item	$ 50,000	$ 50,000	
11.4	Electrical connection	1	Item	$ 60,000	$ 60,000	
12	**MISCELLANEOUS**					$ -
12.1	Driveway crossings		not included		$ -	
12.2	Conduits		not included		$ -	
13	**PROVISIONAL SUM - DAYWORK**		item		$ -	$ -
	TOTAL A - D				$ 3,735,616	**$ 3,735,616**
E	**Contingency**					
	Lower Bound Contingency (0% of D)				0%	$ -
	Upper Bound Contingency (20% of D)				20%	$ 649,672.36
F	**PROJECT BUDGET**					
	Lower Bound Estimate					$ 3,735,616
	Upper Bound Estimate					$ 4,385,288
G	**Project Budget (75% Confidence)**					**$ 4,222,870**

Comments 3m wide footpath costed to be trafficable