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Wonthaggi North East Precinct Structure Plan Transport Impact Assessment

Client //	Bass Coast Shire Council
Office //	VIC
Reference //	V106370
Date //	14/10/2020

Wonthaggi North East

Precinct Structure Plan

Transport Impact Assessment

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Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
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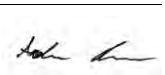
I	14/10/20	Revised Final (Updated Intersection Layouts)	Ajanthan Pillai	Andrew Farran	Andrew Farran	

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Executive Summary

The Wonthaggi North East Precinct Structure Plan (PSP) area skirts the north and east of the existing Wonthaggi township and is generally bound by Fuller Road to the west, Heslop Road to the north and private land holdings to the east and south.

The PSP area is currently occupied by predominantly farming uses, with a combination of low density residential and industrial uses also provided. In the future, the PSP area is envisaged to accommodate up to 4,000 residential dwellings, commercial and industrial enterprises, community facilities and open space. A future PSP road network has been developed, which includes a combination of connector and local access roads. The PSP road network has been developed to cater for vehicles, pedestrians and cyclists.

The PSP road network will include the upgrade of Heslop Road between Korumburra Road and Fuller Road. This link could form part of a future ring road around Wonthaggi. In this respect, it is noted that it is not proposed to specifically deliver a ring road as part of the PSP.

Strategic transport modelling has been completed to determine the future traffic volumes on key roads within and surrounding the PSP Area. The strategic modelling includes the PSP land uses and incorporates background growth up to the year 2046.

The future road network has been modelled with and without a future ring road (i.e. bypass route). The modelling indicates that without the ring road, existing traffic volumes on Bass Highway through the town centre are anticipated to increase by approximately 50% to 20,000vpd. Reference to typical design capacity guidelines would suggest that under this scenario Bass Highway would be on the cusp of requiring duplication. The modelling with the ring road indicates that Bass Highway would experience more modest increases of approximately 10% to 14,000vpd.

Future intersection layouts have been identified for key future intersections along Bass Highway, Korumburra Road and Heslop Road (typically with PSP connector roads). The identified intersection layouts and future traffic volumes (without the ring road) have been used to inform SIDRA INTERSECTION modelling for each intersection. The intersection modelling indicates that each of the future intersections within the PSP area are anticipated to operate with a Level of Service C or better. The intersection modelling indicates that the Bass Highway / McKenzie Street / Graham Street and Bass Highway / Korumburra Road intersections are anticipated to be operating near capacity following the full development of the PSP area.

An assessment of the midblock capacity of each of the key roads within and surrounding the PSP Area indicates that each road is anticipated to operate within its theoretical capacity.

In summary, the proposed road network and intersection layouts are considered to represent an appropriate and functional transport outcome for the PSP area and broader Wonthaggi township.

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1. Introduction

1.1 Background

The Wonthaggi North East Precinct Structure Plan (PSP) is a growth area project that aims to deliver a vibrant community where people can live, work and shop. The PSP area skirts the north and east of the existing Wonthaggi township and is generally bound by Fuller Road to the west, Heslop Road to the north, and private land holdings to the east and south.

The PSP Area is envisaged to accommodate the following land uses:

- up to 4,000 residential dwellings
- commercial and industrial enterprises
- community facilities
- open space.

The Wonthaggi North East PSP is currently being prepared by the Bass Coast Shire Council and Victorian Planning Authority (VPA) in consultation with state authorities (such as VicRoads), landowners and major stakeholders.

1.2 Purpose of this Report

GTA Consultants (GTA) has been engaged to provide input into the required transport network to support the development of the PSP area and to undertake traffic modelling for the PSP (and broader Wonthaggi road network) and translate the outputs into road cross sections and concept intersection designs for input to the PSP and Development Contributions Plan (DCP) process.

This report includes the following:

- Section 2: Overview of existing transport context
- Section 3: Background review of previous relevant studies
- Section 4: Overview of proposed PSP
- Section 5: Transport modelling (strategic and intersection) of PSP
- Section 6: Concept Layout Plans and costings

1.3 Updated PSP Layout/Report

1.3.1 Wentworth Road Modification (Issue E Onwards)

In early 2019, the Wonthaggi North East PSP was updated to reflect the presence of a wetland reserve along Heslop Road. Further studies into the area revealed that the proposed connector boulevard would have traversed the wetland reserve, representing an unacceptable environmental impact on the community. As such, the PSP road network has been updated to avoid passing through the proposed wetland reserve. This will be achieved by connecting St Clair Boulevard directly to Heslop Road to the east of the wetland reserve rather than through an upgrade of Wentworth Road north of St Clair Boulevard, as was previously proposed.

The superseded PSP road network and the updated PSP road network are illustrated in Figure 1.1 and Figure 1.2, respectively.

Figure 1.1: Previous PSP Road Network

Figure 1.2: Updated PSP Road Network

As shown above, the main change to the road network to reflect these findings is the realignment of St Clair Boulevard and truncation of Wentworth Road. In the context of the overall PSP the proposed changes are relatively minor and accordingly the strategic modelling has not been updated as part of this updated report, noting that no material changes would be expected to model outcomes.

This report has been updated to include an updated concept layout plan to reflect the revised road network alignment and associated intersection costing (IN-02).

1.3.2 John Street Link (Issue G Onwards)

In late 2019, the Wonthaggi North East PSP was updated to address localised vehicle access constraints for the commercial land uses along Bass Highway. As a result, a new roundabout has been provided on Bass Highway at John Street between St Clair Boulevard and Carneys Road.

Similar to above, the proposed changes are relatively minor and accordingly the strategic modelling has not been updated as part of this updated report. Indeed, the introduction of the new roundabout would reduce vehicle demands at the adjacent intersections on Bass Highway at Carneys Road and St Clair Boulevard.

1.4 References

In preparing this report, reference has been made to the following:

- Bass Coast Planning Scheme
- 'Wonthaggi Road Network Action Plan' prepared by URS for Bass Coast Shire Council, dated 6 July 2012
- 'Wonthaggi North East Growth Area Development Plan', prepared by CPG Australia, dated November 2009
- 'Wonthaggi Development Plan: Traffic Impact Assessment' prepared by CPG Australia, dated December 2009
- traffic surveys undertaken by GTA as referenced in the context of this report
- an inspection of the area and its surrounds
- other documents as nominated.

2. Existing Transport Context

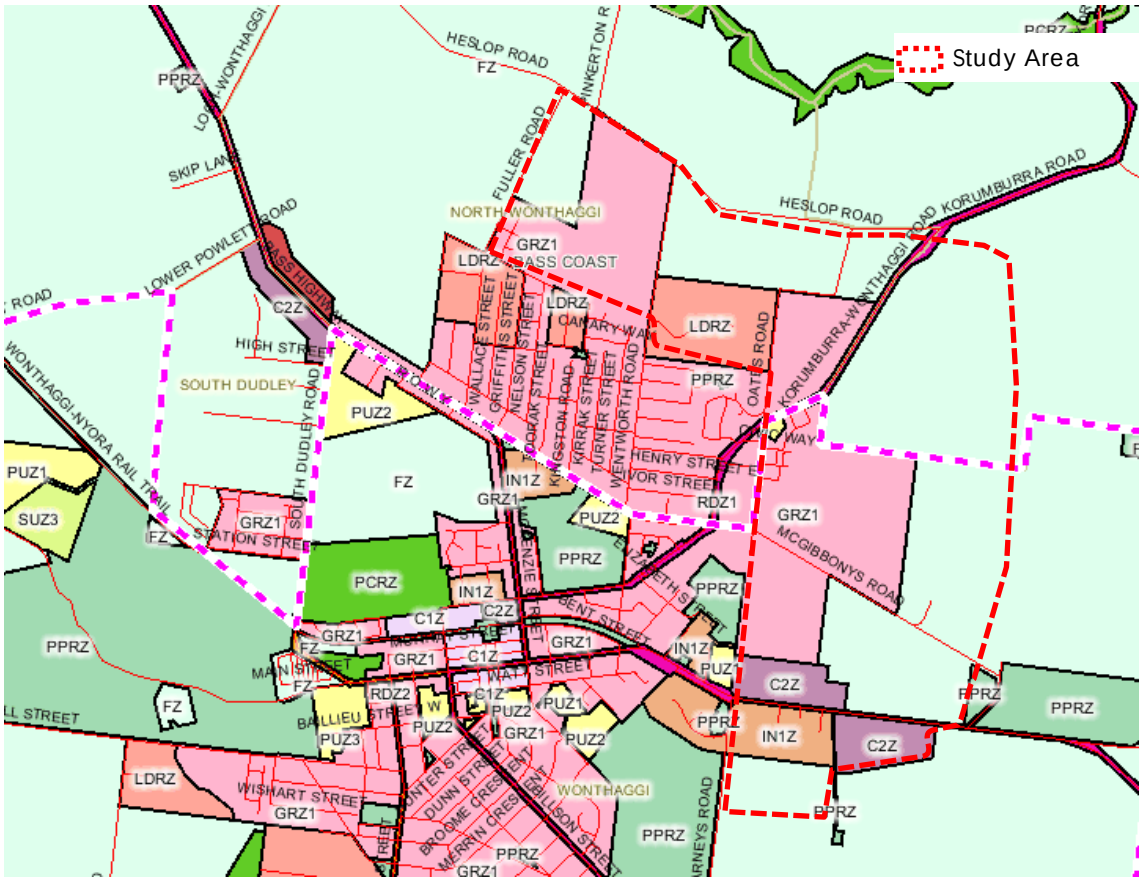
2.1 Subject Area

The subject area is in northern Wonthaggi, loosely bordered by Fuller Road to the west, Heslop Road to the north and the Bass Highway to the south.

The areas surrounding the site are largely residential and rural, with recreation and industrial areas located further south.

The location of the subject site and the surrounding environs is shown in Figure 2.1.

Figure 2.1: Land Zoning Map



(Reproduced from Land Channel web site)

2.2 Road Network

2.2.1 Overview

Three regional highways (arterial roads) converge in the Wonthaggi township.

Bass Highway (M420/460) connects the South Gippsland Highway near Lang Lang to the north with Leongatha to the east of Wonthaggi. Bass Highway provides the primary connection between the Bass Coast Local Government Area and metropolitan Melbourne. It also provides the most convenient link between Wonthaggi and Inverloch to the east. In the vicinity of Wonthaggi, it is configured with a single traffic lane in each direction, with parking lanes on both sides of the road. Bass Highway forms a key freight route servicing the needs of the broader Gippsland region. Direct vehicle access is provided to the properties fronting the Bass Highway within the Wonthaggi township.

Korumburra-Wonthaggi Road (M437) connects Wonthaggi to Korumburra approximately 30km to the northeast. It is configured with a single traffic lane in each direction. Direct vehicle access is provided to the properties between Bass Highway and Wentworth Road (i.e. older part of town), with direct vehicle access generally restricted or facilitated via a service road east of Wentworth Road (i.e. newer part of town).

Cape Paterson Road (M435) connects Wonthaggi to Cape Paterson approximately 8km to the south. It also forms a secondary tourist link between Wonthaggi and Inverloch, although is less convenient than the Bass Highway. It is configured with a single traffic lane in each direction. Occasional direct vehicle access is provided to the properties abutting Cape Paterson Road in the Wonthaggi township.

Wentworth Road, Fuller Road and Oates Road are Council roads, generally aligned in a north-south direction, that service the study area. These roads primarily service existing residential properties at their southern ends. Loch-Wonthaggi Road and Heslop Road are rural roads to the north and west boundaries of the study area.

The characteristics of the key roads within and surrounding the study area are summarised in Table 2.1. Photos of the key roads are provided in Appendix A.

It is noted that the indicative maximum traffic volumes presented in the table have been sourced from the following:

- Arterial Roads: Austroads Guide
- Council Roads: Clause 56.06 of the Bass Coast Planning Scheme
- Unsealed Roads: Australian Road Research Board (ARRB) Unsealed Roads Manual 'Guidelines to Good Practice' (March 2009).

Table 2.1: Existing Road Characteristics

Road	Classification	Carriageway Surface	Carriageway Width (approx.)	Parking Provisions	Speed Limit	Existing Daily Traffic Volume (Two Way)[1]	Indicative Daily Traffic Volume Capacity	Footpaths
Bass Highway (north of Wonthaggi)	Arterial Road	Sealed	7.0m	None	100km/h	9,752 vehicles	18,000 vpd	None
Bass Highway (in Wonthaggi)	Arterial Road	Sealed	Varies	Dedicated parking lane both sides		13,012 vehicles	18,000 vpd	Both sides
Bass Highway (east of Wonthaggi)	Arterial Road	Sealed	7.0m	None	100km/h	9,150 vehicles	18,000 vpd	None
Korumburra-Wonthaggi Road (at Oates Road)	Arterial Road	Sealed	7.0m	None	60km/h	2,155 vehicles	18,000 vpd	None
Cape Paterson Road / Billson Street (at Broome Crescent)	Arterial Road	Sealed	8.0m	Informal verge parking	60km/h	2,255 vehicles	18,000 vpd	Both sides
South Dudley Road	Connector Road	Sealed	7.0m	None	80km/h	4,500 vehicles [2]	7,000 vpd	East side only
Loch Wonthaggi Road	Local Road	Sealed	6.0m	None	100km/h	778 vehicles	3,000 vpd	None
Heslop Road	Local Road	Unsealed	7.0m	Both sides of carriageway	Unsignposted	136 vehicles	250 vpd	None
Fuller Road	Local Road	Sealed south of Vicars Avenue	7.0m	Both sides of carriageway	50km/h	NA	3,000 vpd	East side only
Wentworth Road	Local Road	Sealed to Oxford Way	7.5m	Both sides of carriageway	50km/h	2,775 vehicles	3,000 vpd	West side only
Oates Road	Local Road	Unsealed	7.0m	None	50km/h	NA	250 vpd	None
John Street	Local Road	Unsealed	6.0m	None	50km/h	NA	250 vpd	none

[1] Weekday average for the week commencing 18/10/2016
[2] Based on turning movement counts undertaken on 19 October 2016 and adopting a peak-to-daily ratio of 10%.

2.2.2 Traffic Volumes

GTA commissioned peak hour traffic movement counts at various intersections on Wednesday 19 October 2016. In addition, 24 hour, 7-day tube counts were undertaken at strategic locations within and surrounding the study area for the week commencing Tuesday 18 October 2016.

The AM and PM peak hour traffic volumes are shown in Figure 2.2 and Figure 2.3, respectively.

Figure 2.2: Existing AM Peak Hour Traffic Volumes

Figure 2.3: Existing PM Peak Hour Traffic Volumes

An overview of the average daily traffic volumes at key locations surrounding the study area is shown in Figure 2.4.

Figure 2.4: Existing Daily Traffic Volumes

2.2.3 Existing Freight Routes

The VicRoads gazetted network for B-double vehicles on arterial and municipal roads is presented in Figure 2.5.

Figure 2.5: VicRoads B-Double Network – Wonthaggi Township

(Source: VicRoads Website: Victoria's gazetted B-Double Network)

Figure 2.5 indicates that each of the VicRoads roads servicing Wonthaggi are approved B-double routes. In addition, the Bass Highway through Wonthaggi is also an approved Oversize and Overmass route (OSOM).

A summary of the existing heavy vehicle traffic volumes on the arterial road network surrounding Wonthaggi are provided in Table 2.2.

Table 2.2: Heavy Vehicle Traffic Volume Summary

Location	Daily Total Traffic Volumes	Daily Heavy Vehicle Traffic Volumes	Percentage Heavy Vehicles
Bass Highway (north of Wonthaggi)	9,752	976	10%
Bass Highway (in Wonthaggi)	13,012	706	5.4%
Bass Highway (east of Wonthaggi)	9,150	649	7.1%
Korumburra-Wonthaggi Road (north east of Wonthaggi)	2,155	166	7.7%
Cape Paterson Road (south of Wonthaggi)	2,255	129	5.7%

2.3 Public Transport

Wonthaggi is serviced by several regional buses, as summarised in Table 2.3.

Table 2.3: Bus Services in Wonthaggi

Route Description	Significant Destinations On Route	Frequency On/Off Peak
Wonthaggi - Dudley - Wonthaggi	Biggs Drive bus interchange, McKenzie Street, Bass Hwy, Dudley Street	2 hours/2.5 hours
Wonthaggi - Leongatha via Inverloch	McKenzie Street, Biggs Drive bus interchange, Toorak Road, The Esplanade, Bass Hwy, Leongatha Railway Station, Leongatha Secondary College	One service per day
Wonthaggi - South Wonthaggi - Wonthaggi	Biggs Drive bus interchange, Wonthaggi Hospital	1.5 hours/2 hours
Wonthaggi - Traralgon via Leongatha	Traralgon Station, Latrobe Regional Hospital, Morwell Bus Interchange, Leongatha Railway Station, Biggs Drive bus interchange	3 hours
Wonthaggi - Wonthaggi North - Wonthaggi	Biggs Drive bus interchange, Wonthaggi YMCA, Wentworth Road, Dowling Street	1.5 hours/2 hours
Wonthaggi Town Service (Cape Paterson)	Cape Paterson Rd, Biggs Drive bus interchange	2 hours

The Wonthaggi town service is aligned in a circuit around the town. Travel times on the bus are greater than typical driving times. This is reflected in the relatively low mode share to bus presented later in this section.

2.4 Active Travel

Pedestrian Facilities

Pedestrian footpaths are generally provided on both sides of roads within the Wonthaggi town centre and on major roads accessing the town (such as Bass Highway and Korumburra-Wonthaggi Road). Pedestrian paths are provided on one side of Wentworth Road and Fuller Road accessing the PSP Area. In general, pedestrian footpaths are currently not provided on the lower order streets within residential areas of Wonthaggi.

Bass Coast Rail Trail

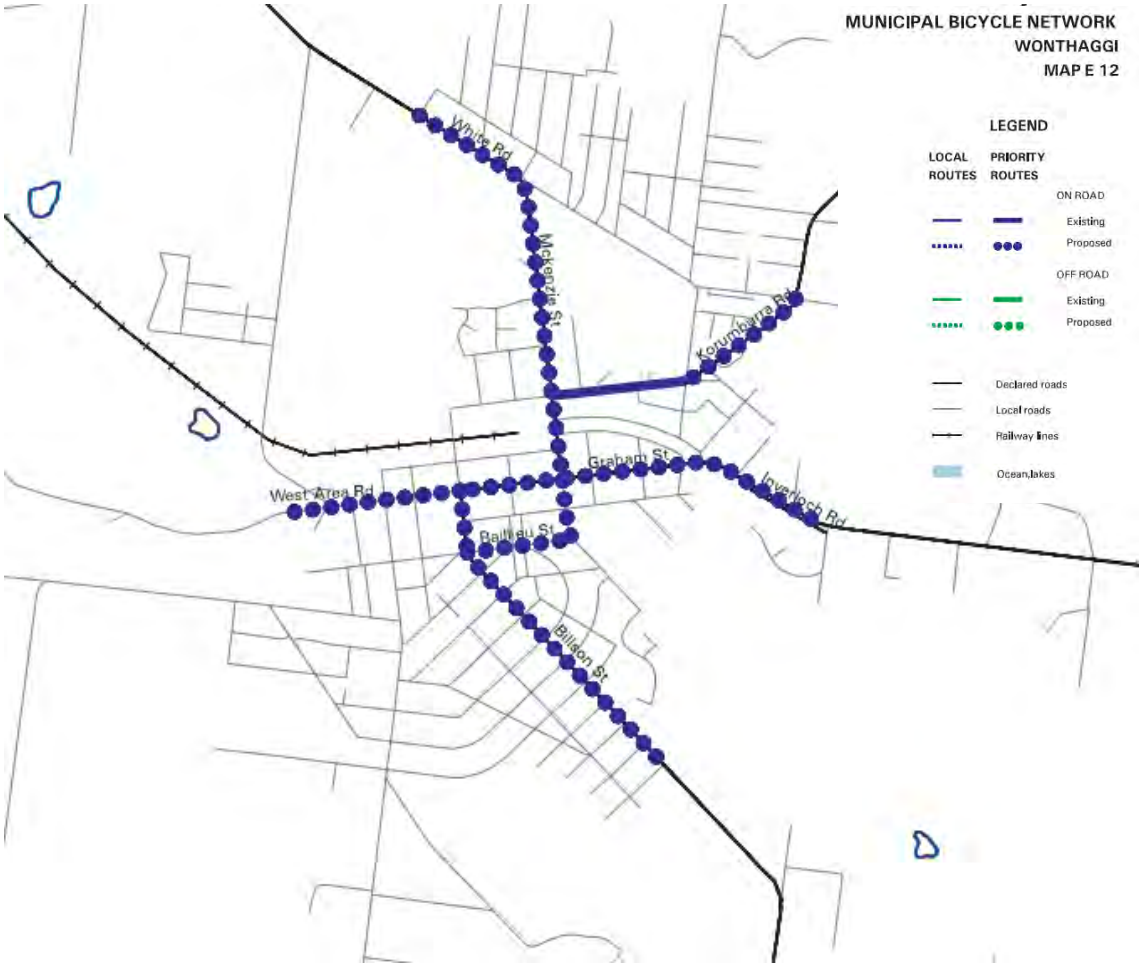
The Bass Coast Rail Trail is a 17km off-road trail that connects Wonthaggi with the townships of Kilcunda and Anderson to the west. The trail follows the former rail line that previously serviced the precinct. The trail is suitable for pedestrians, cyclists and horse riders. The trail terminates at the Billson Street (south of the McKenzie Street unused road reserve) after passing through the town.

Municipal Bicycle Networks

The Municipal Bicycle Networks (MBN) represent the core bicycle networks in regional Victorian cities. Maps have been developed for thirty-six MBNs for towns and cities in regional Victoria. These networks include existing and proposed on-road and off-road facilities and are managed by the responsible local Council. VicRoads plans to systematically expand the bicycle planning tools available to cities, towns and centres in regional areas to be commensurate with those provided for metropolitan Melbourne.

The MBN for Wonthaggi is shown in Figure 2.6[1]. The Rail Trail and Cape Pattterson Road bike lanes do not form part of the MBN.

Figure 2.6: Municipal Bicycle Network for Wonthaggi



Source: VicRoads Website

2.5 Accident History

A review of the reported casualty accident history for the roads and intersections adjoining the study area has been sourced from VicRoads CrashStats accident database. This database records all accidents causing injury that have occurred in Victoria since 1987 (as recorded by Victorian Police) and categorises these accidents as follows:

- Fatal injury: at least one person was killed in the accident or died within 30 days as a result of the accident.
- Serious injury: at least one person was sent to hospital as a result of the accident.
- Other injury: at least one person required medical treatment as a result of the accident.

A summary of the accidents in the vicinity of the site for the last available five year period (2011-2016) is presented in Figure 2.7.

[1] Further information regarding the PBN and BPRs is available at https://www.vicroads.vic.gov.au/traffic-and-road-use/cycling/bicycle-network-planning

Figure 2.7: Wonthaggi Casualty Accident History Overview

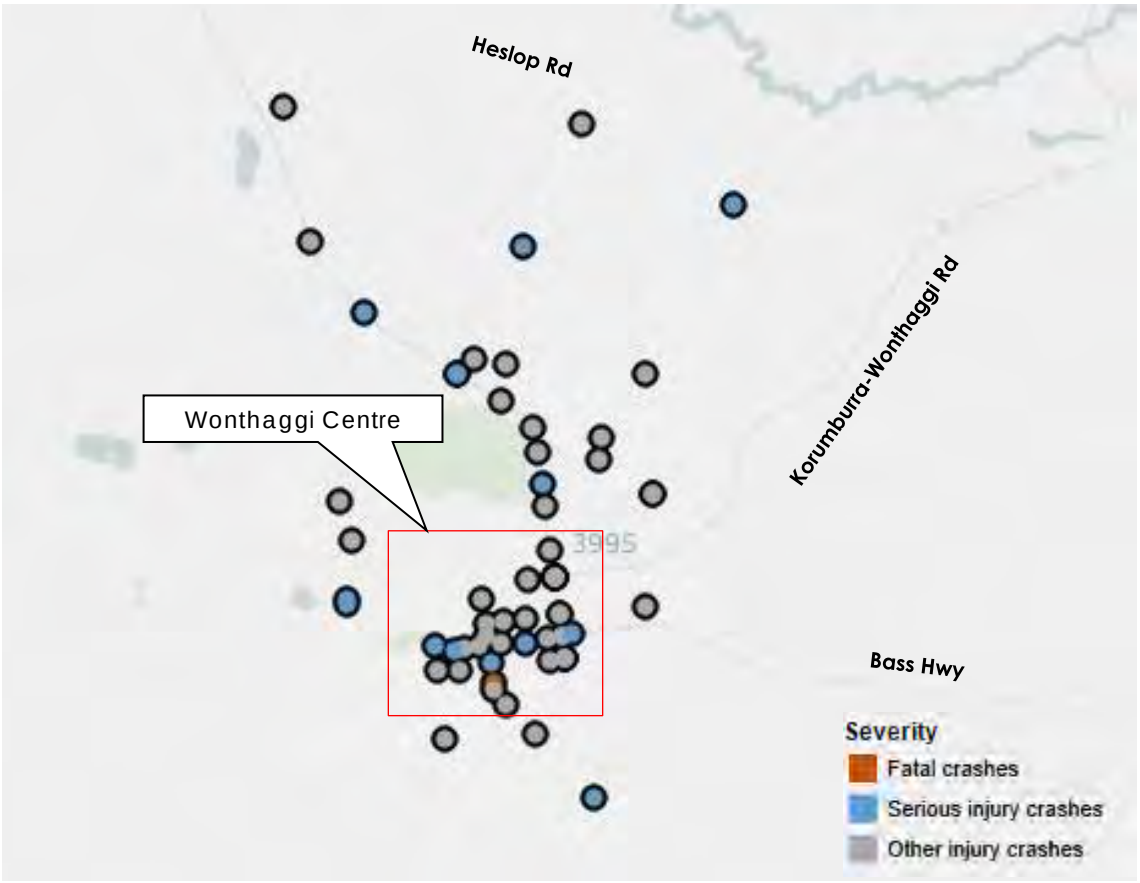


Figure 2.8: Wonthaggi Centre Casualty Accident History Overview

Data obtained from CrashStats indicates that a total of 64 crashes were recorded for the indicated region in the last five-year period, including one fatality, 18 serious and 45 other type accidents. It is noted that many of these crashes (36) are located within the Wonthaggi city centre (indicated by the red box).

There have been four accidents within the PSP Area, including:

- Heslop Road / Korumburra Road intersection (x2)
- Heslop Road (approximately 200m east of Wentworth Road)
- Fuller Road (approximately 200m south of Heslop Road).

2.6 Existing Travel Behaviour

Guidance on existing travel behaviour within Wonthaggi has been sourced from the Australian Bureau of Statistics (ABS) 2011 Census data, which provides information regarding journey to work mode choices. Data for Wonthaggi and the nearby local government areas has been extracted to determine the variance in travel behaviour between the different locations. This data is provided in Table 2.4.

Table 2.4: Journey to Work by Place of Residence

Location [1]	Mode of Transport				
	Public Transport	Car	Bicycle	Walk	Other
Wonthaggi & Wonthaggi North (Postcode 3995)	1%	90%	1%	6%	2%
Bass Shire Council Area	1%	90%	1%	6%	2%
South Gippsland Council Area	1%	86%	1%	9%	3%
Baw Baw Council Area	2%	90%	0%	5%	3%

[1] Includes all employees regardless of wok location (i.e. in or out of their LGA of residence).

As presented in Table 2.4, there is a high level of car dependence for travel within Wonthaggi and surrounding regions.

2.7 Existing Residential Traffic Generation Rates

GTA undertook peak hour traffic surveys of an existing residential precinct in Dudley South to determine the existing residential traffic generation rate. The surveys captured the traffic generated by the residential properties bound by South Dudley Road, Alexander Road, Hull Street and Station Street. A summary of the survey results are provided in Table 2.5.

Table 2.5: Existing Residential Traffic Generation Rate

Peak Hour	Time of Peak	Peak Hour Traffic Movements			No. of Dwellings Accessed	Peak Hour Traffic Generation Rate
		In	Out	Total		
AM	8:15-9:15	36	75	111	160	0.69
PM	4:00-5:00	78	54	132		0.83

The existing surveyed peak hour traffic generation rates of 0.69 and 0.83 are similar to the residential traffic generation rates of 0.71 and 0.78 for the AM and PM peak hours respectively presented in the RMS Guide for Traffic Generating Developments (Technical Direction dated August 2013).

3. Background Document Review

3.1 Wonthaggi Road Network Action Plan Report

The Wonthaggi Road Network Action Plan (WRNAP) was prepared by URS Australia Pty Ltd, on behalf of Bass Coast Shire Council, with the final report released in July 2012. The WRNAP develops the findings and recommendations of the Wonthaggi CBD Traffic Impact Study completed in 2010.

The assessment identifies a number of existing and anticipated future issues, including:

- The Murray Street / Bass Highway (McKenzie Street) and Korumburra-Wonthaggi Road Road / Bass Highway (McKenzie Street) intersections are identified as currently (2010) operating at capacity.
- A number of intersections along the Bass Highway, within the town centre, are identified as operating above their theoretical capacities in the future.
- Limited pedestrian facilities are provided linking the various uses within the CBD.
- Limited dedicated cycling facilities are provided within the town centre.
- "Rat running" from commercial vehicles occurs as a result of existing congestion in the town centre.

As a result of the outcomes from the previous Wonthaggi CBD Traffic Impact Study the WRNAP recommends a number of infrastructure upgrades to Wonthaggi CBD (and surrounds), including:

- Signalisation of the Bass Highway (McKenzie Street) / Korumburra-Wonthaggi Road intersection.
- Provision of a two-lane roundabout at the Bass Highway (McKenzie Street) / Bass Highway (Graham Street) intersection.
- Review of CBD parking provisions.
- The introduction of a Wonthaggi Bypass.

Of particular relevance to the PSP is the proposed Wonthaggi Bypass, with the preferred route identified through the proposed PSP Area. The WRNAP suggests that the Bypass could be constructed in two stages, as summarised in Table 3.1.

Table 3.1: Proposed Bypass Route (WRNAP)

Stage	Existing Road Reserve	Connecting	Distance
1	Heslop Road	North of Wonthaggi to Korumburra-Wonthaggi Road	4.9km
2	Greenfield corridor	East of Wonthaggi to Korumburra-Wonthaggi Road	3.6km

The indicative alignment of the proposed Bypass route is illustrated in Figure 3.1.

Figure 3.1: Proposed Bypass Route (WRNAP)

(Source: Figure 4.3 of the WRNAP, prepared by URS, dated 6 JULY 2016)

3.2 Wonthaggi North East Growth Area Development Plan

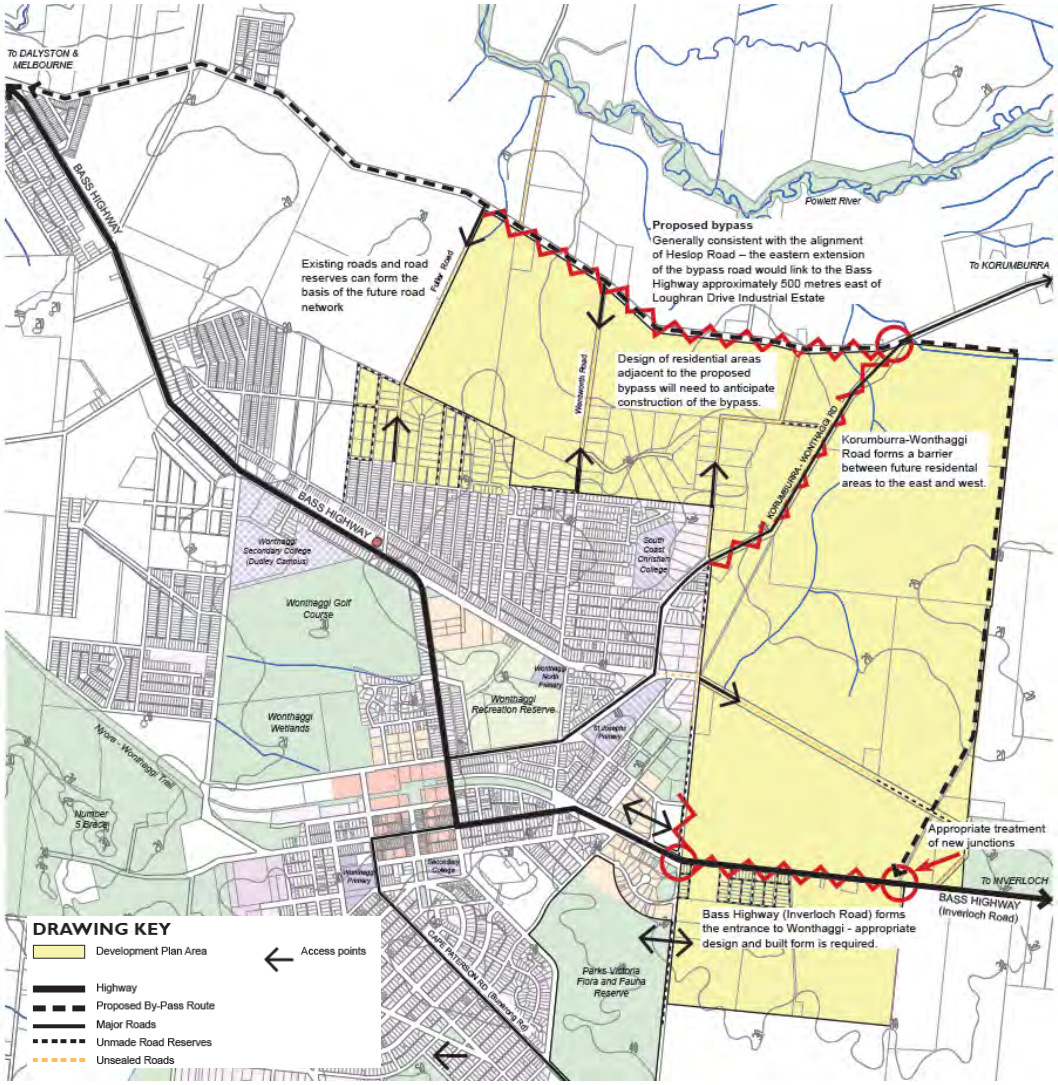
The Wonthaggi North East Growth Area Development Plan was prepared by CPG (November 2009). The document considers the infrastructure requirements to service the Wonthaggi Dalyston Structure Plan (2008). The study area for the Development Plan generally aligns with the proposed PSP Area. The study considered an approximate development yield of 4,000 dwellings, as well as an activity centre, open space and employment areas.

A Traffic Impact Assessment report (December 2009) was prepared to accompany the Development Plan documentation. The assessment considered an interim development scenario (+20 years), rather than a full build out of the study area, which included 1,540 dwellings and 43ha of industrial development.

The future traffic generation of the development was determined by applying "industry standard" traffic generation rates to the proposed development yield. Of particular note, a daily traffic generation rate of 7 movements per dwelling was adopted for the proposed residential uses. The development (+20 year design horizon) was anticipated to generate approximately 15,500 vehicle trips per day. An assessment of the post development traffic capacity of the surrounding road network was undertaken.

An overview of the site context and movement plan is presented in Figure 3.2.

Figure 3.2: Site Context Plan – Movement



(Source Figure Two, page 39 of the CPG Report, dated November 2009)

A number of strategic initiatives and recommended mitigation works are detailed in the report, including the following relevant to the PSP Area:

- Provision of a 50m wide road reservation to accommodate a future Bypass route.
- Provision of a two-lane roundabout at the Bass Highway (McKenzie Street) / Korumburra-Wonthaggi Road intersection.
- Signalisation of the Bass Highway (McKenzie Street) / Bass Highway (Graham Street) intersection.
- Constriction of all intersections between the proposed Bypass, Bass Highway and Korumburra-Wonthaggi Road as two-lane roundabouts.
- Various upgrades to the Bass Highway, including the introduction of auxiliary turn lanes, medians and roundabouts (30m diameter central island).
- An upgrade to Korumburra-Wonthaggi Road to include auxiliary turn lanes, wide sealed shoulders and bike lanes. Two-lane roundabouts should be provided at all future intersections with connector roads and Korumburra-Wonthaggi Road.

3.3 Clause 18 of the Planning Scheme

Clause 18 of the Planning Scheme is designed to reflect the intent of State Government guidance and contains objectives and strategies in relation to transport which are relevant to this development, including, but not limited to:

- Create a safe and sustainable transport system by integrating land-use and transport.
- Plan or regulate new uses or development of land near an existing or proposed transport route to avoid detriment to, and where possible enhance the service, safety and amenity desirable for that transport route in the short and long terms.
- Facilitate and safeguard pedestrian and cyclists access to public transport.
- Promote the use of sustainable personal transport.
- Integrate planning for cycling with land use and development planning and encourage as alternative modes of travel.
- Achieve greater use of public transport by increasing densities, maximising the use of existing infrastructure and improving the viability of the public transport operation.

3.4 Smart Roads

SmartRoads is a VicRoads policy which sets 'modal' priorities on the road network and underpins many of the strategies significant to the operational directions that support broader strategies around land use and transport.

"There is no single solution to managing congestion on our roads. Sustainable management of congestion will require an integrated approach involving better management of the existing network, building new infrastructure, visionary land use planning, encouraging sustainable transport modes, and changes in behaviour by individuals, businesses and a level of government." [2]

All road users will continue to have access to all roads. However, certain routes will be managed to work better for cars while others for public transport, cyclists and pedestrians during the various peak and off-peak periods. In this regard, the following is noted by VicRoads for the various modes assigned to arterial roads across the network that form part of the Network Operating Plans:

- *"Facilitate good pedestrian access into and within activity centres in periods of high demand*
- *Prioritise trams and buses on key public transport routes that link activity centres during morning and afternoon peak periods*
- *Encourage cars to use alternative routes around activity centres to reduce the level of 'through' traffic*
- *Encourage bicycles through further developing the bicycle network*
- *Prioritise trucks on important transport routes that link freight hubs and at times that reduce conflict with other transport modes".*

The internal road network should have regard to the SmartRoads principles.

[2] Sourced from VicRoads

4. Wonthaggi North PSP

4.1 Indicative Land Uses

The PSP area skirts the north and east of the existing Wonthaggi township and is generally bound by Fuller Road to the west, Heslop Road to the north and private land holdings to the east and south. A summary of the indicative land uses to be provided within the Wonthaggi North PSP Area is provided in Table 4.1.

Table 4.1: Land Use Forecasts

Land Use	Size
Residential	4,000 dwellings
Village Hub	1 x 2,000sqm
Community Hub	2 x 500sqm
Convenience Centres	4,500sqm (3 x convenience centres)

An overview of the proposed future road layout and land use distribution is presented in Figure 4.1 on the following page.

4.2 Road Network

4.2.1 Hierarchy

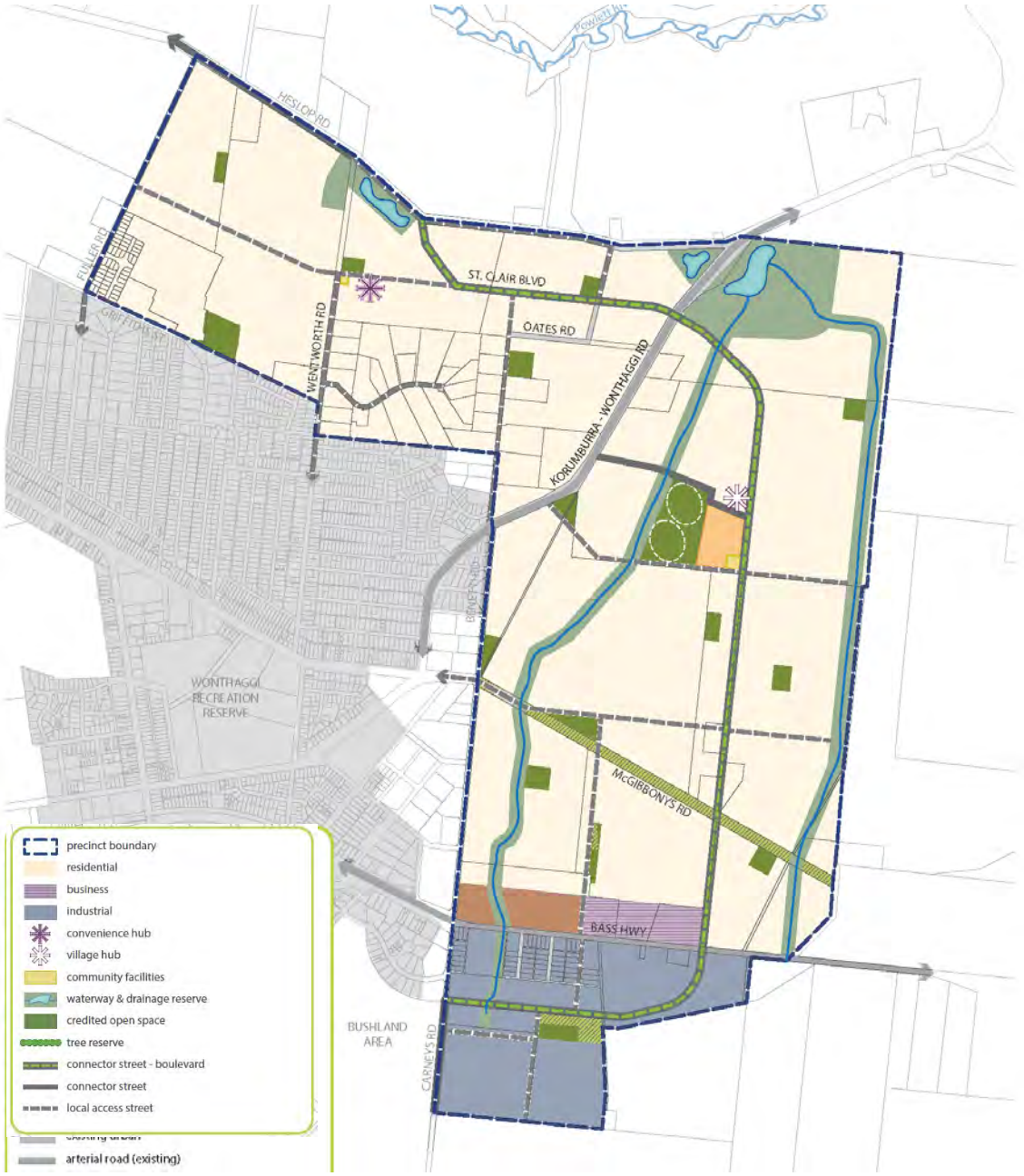
An overview of the proposed future road network to be delivered as part of the PSP is illustrated in Figure 4.1. The road network plan shows all connector streets and above, as well as some local access streets (but not all). The majority of lower order road network is not shown on the plans and will be delivered as part of the future subdivision applications.

It is noted that any future bypass road is not proposed to be delivered as part of the PSP. The PSP will however deliver an upgraded Heslop Road (to a rural connector road standard) between Fuller Road and Korumburra Road. Heslop Road, between Fuller Road and Bass Highway will be delivered as part of subsequent stages. More broadly the upgrade of Heslop Road could form the first stage of a future bypass with the second stage linking Korumburra Road to Bass Highway (east of town).

Other key features of the proposed PSP Area road network include:

- A future boulevard connector road (known as St Clair Boulevard) connecting Heslop Road to Korumburra Road and Bass Highway
- Two new connections to Bass Highway east of the town centre (at St Clair Boulevard and Carneys Road)
- Continuation of Oates Road, Wentworth Road and Fuller Road into the PSP Area
- A new major intersection to Korumburra Road (at St Clair Boulevard).

Figure 4.1: PSP Road Network Plan



4.2.2 Cross Sections

The PSP Area proposes a number of different road types, including boulevard connectors, connectors and local access streets. The proposed cross-sections of each of these road types are presented in Figure 4.2 to Figure 4.13.

Figure 4.2: Indicative Cross-Section - 30m Boulevard

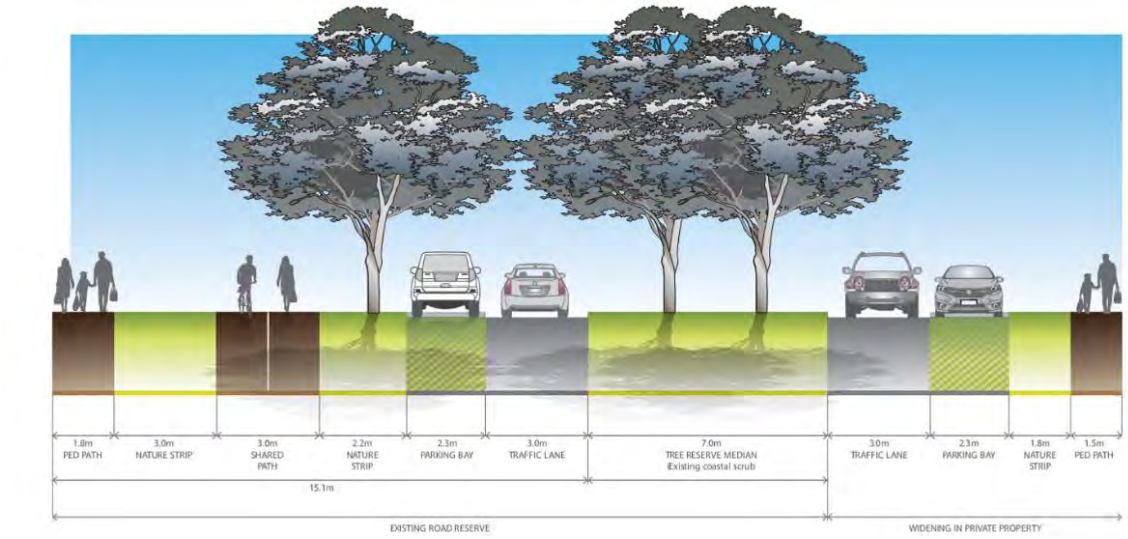


Figure 4.3: Indicative Cross-Section - Bass Highway Interface

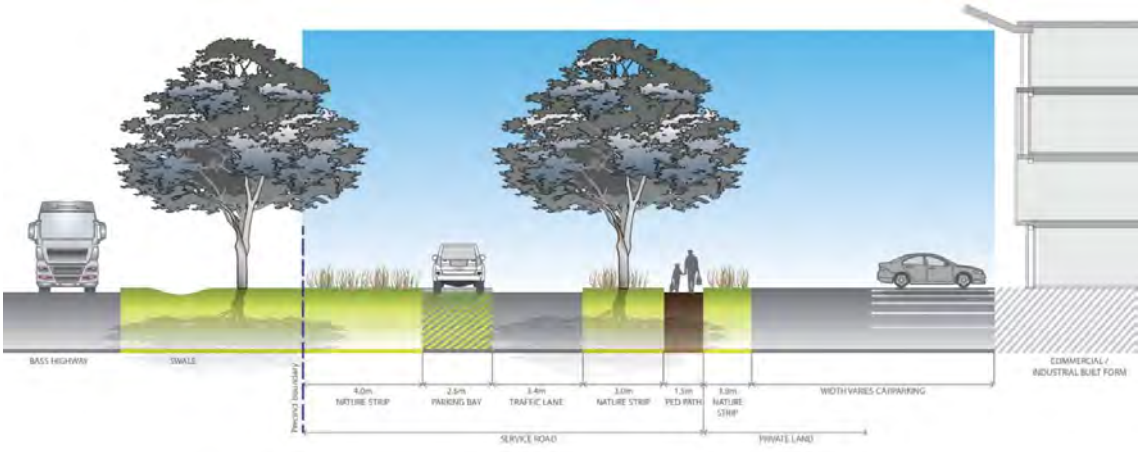


Figure 4.4: Indicative Cross-Section - CS1 Connector Street Boulevard (28.0-31.0m)

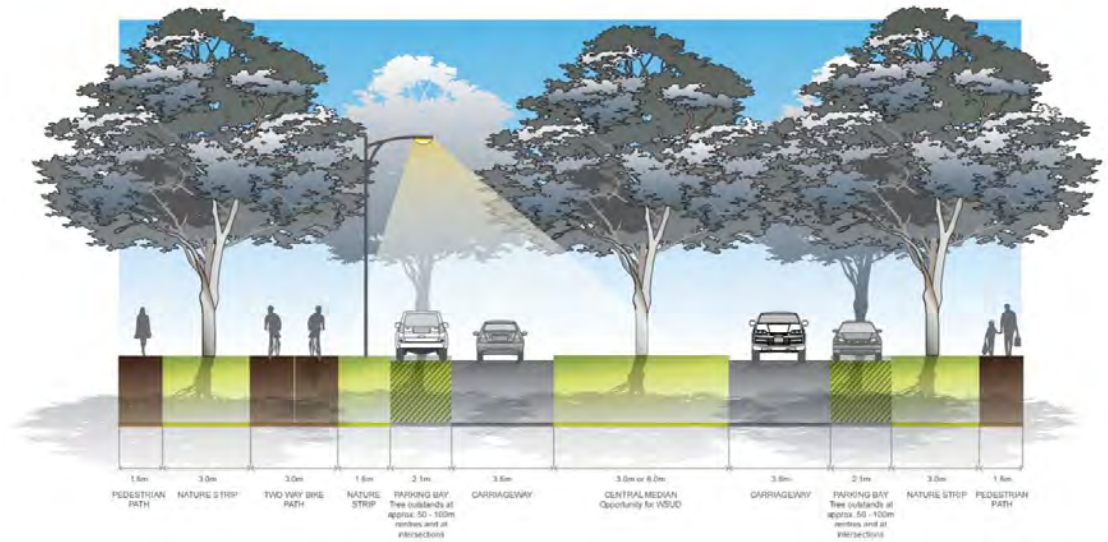


Figure 4.5: Indicative Cross-Section - CS2 Connector Street (25.0m)

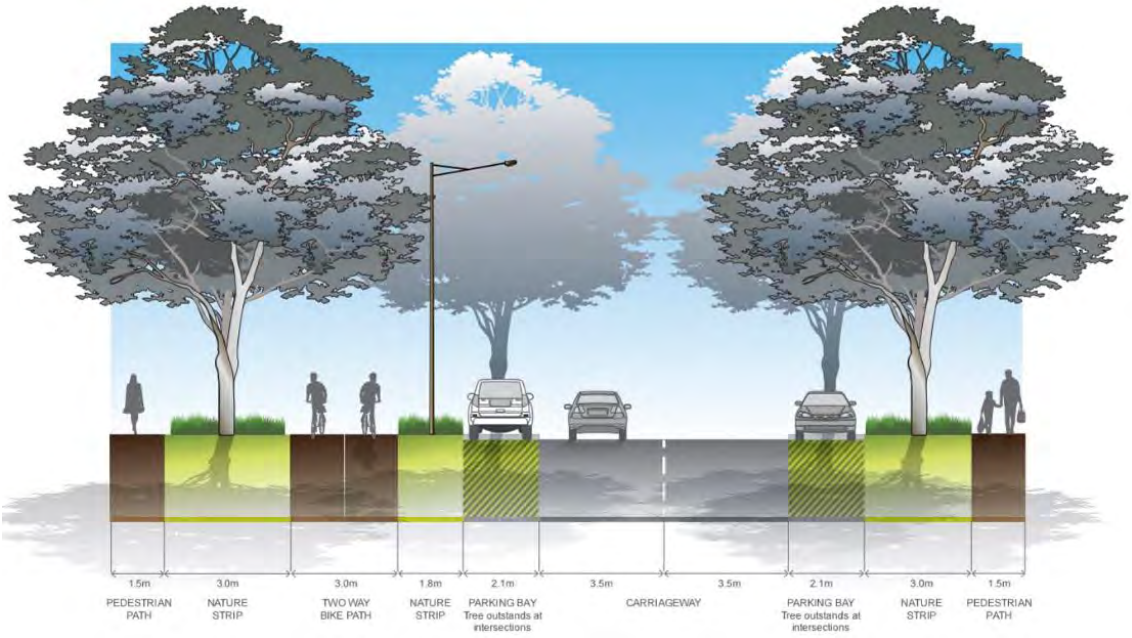


Figure 4.6: Indicative Cross-Section - Connector Street Variations (25m)

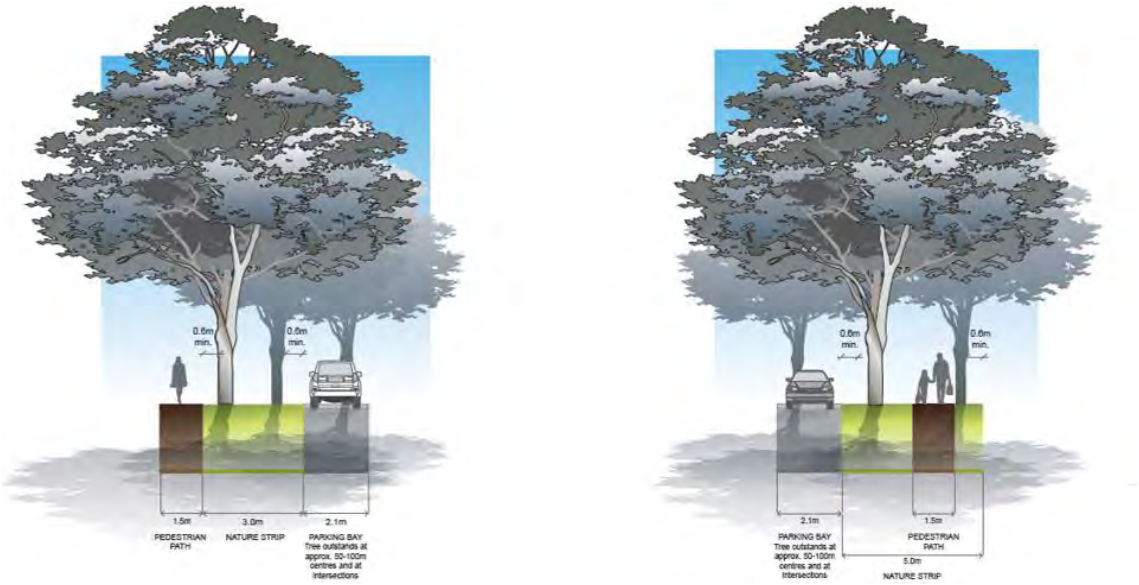


Figure 4.7: Indicative Cross-Section - Local Access Level 1 (16m)

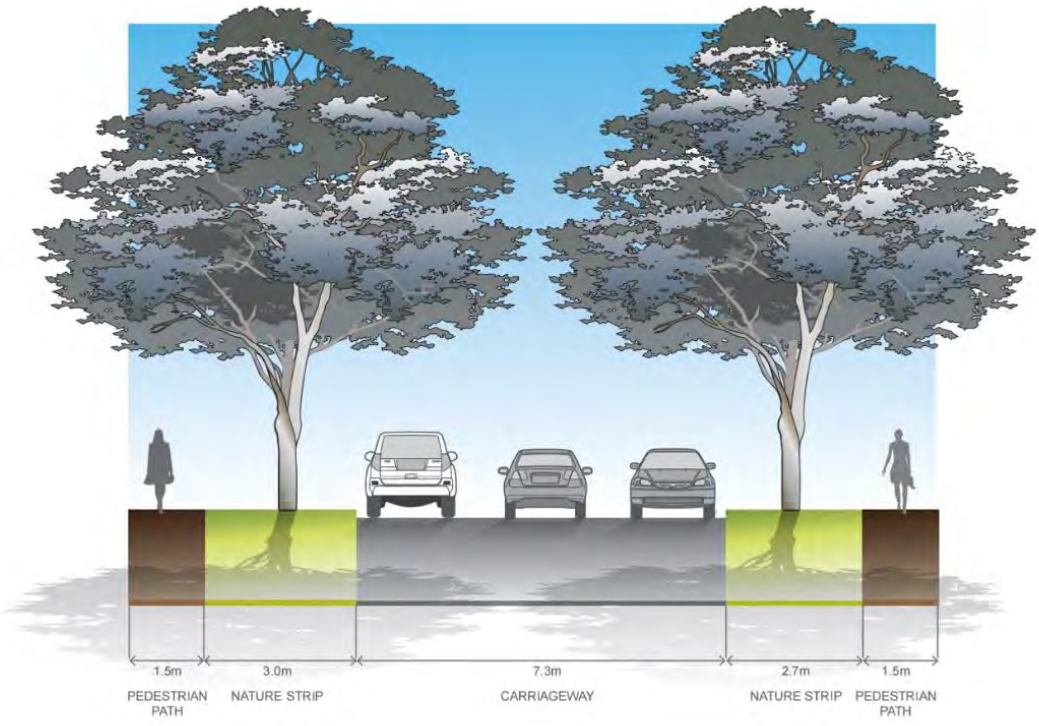


Figure 4.8: Indicative Cross-Section - Local Access Level 1 Variations (16m)

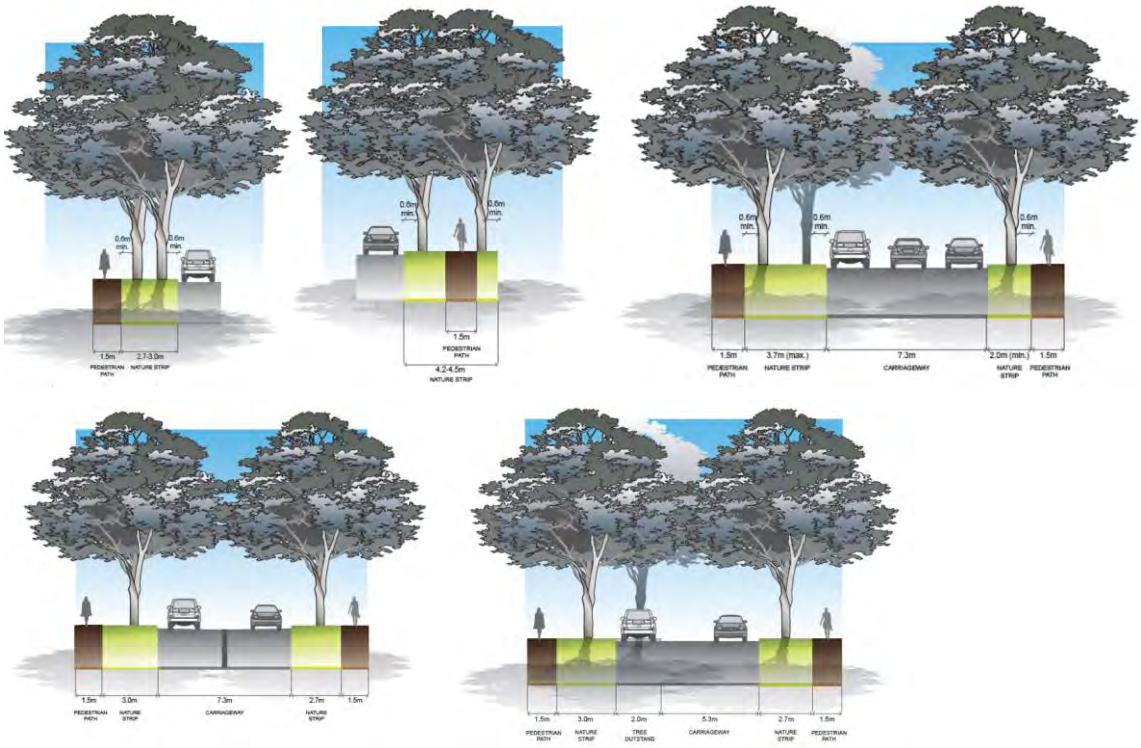


Figure 4.9: Indicative Cross-Section - Local Access Level 2 (20m)

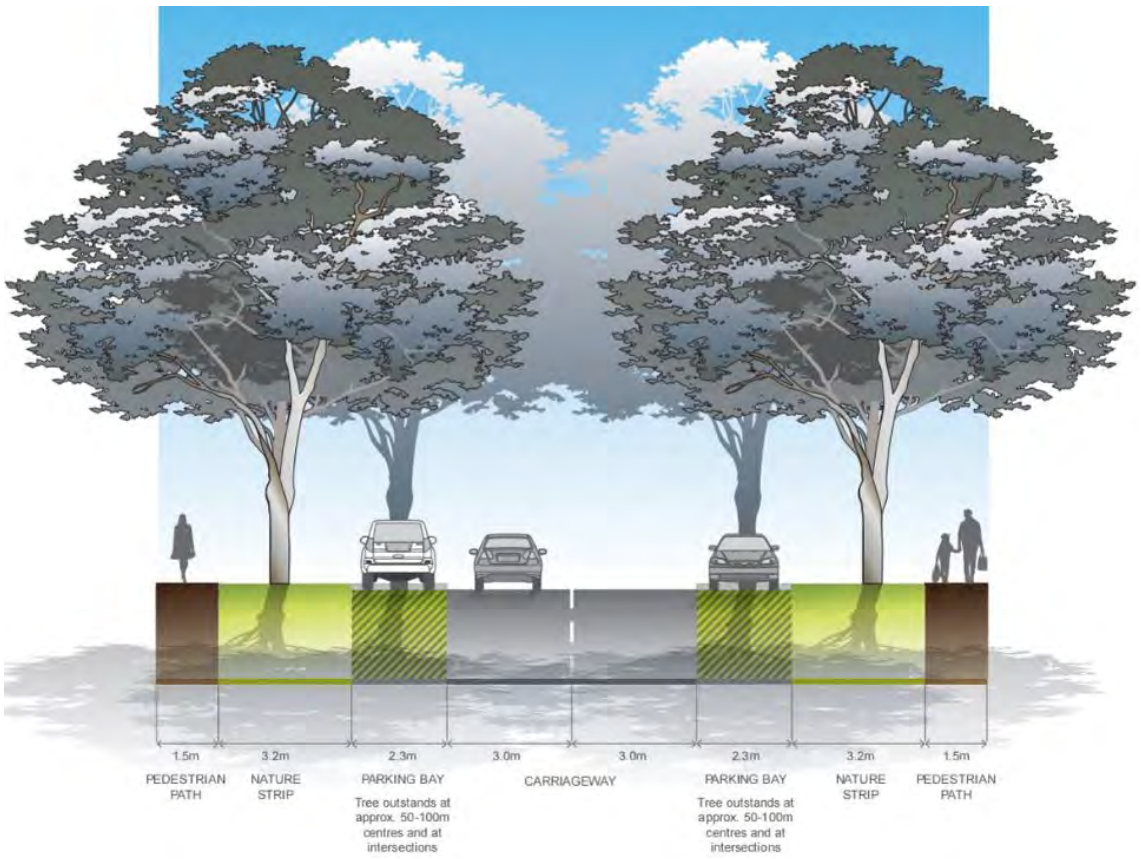


Figure 4.10: Indicative Cross-Section - Local Access Level 2 (20m Variation – Central Drainage)

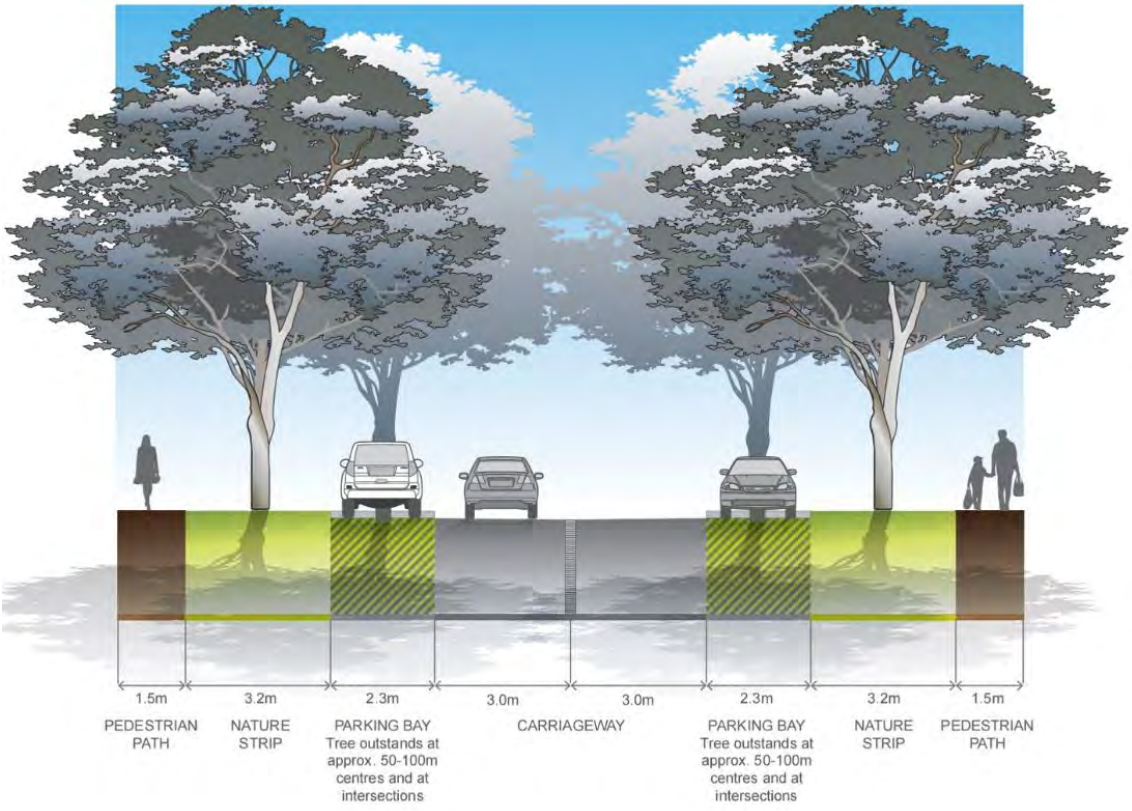


Figure 4.11: Indicative Cross-Section - Local Access Level 2 (22m, Industrial)

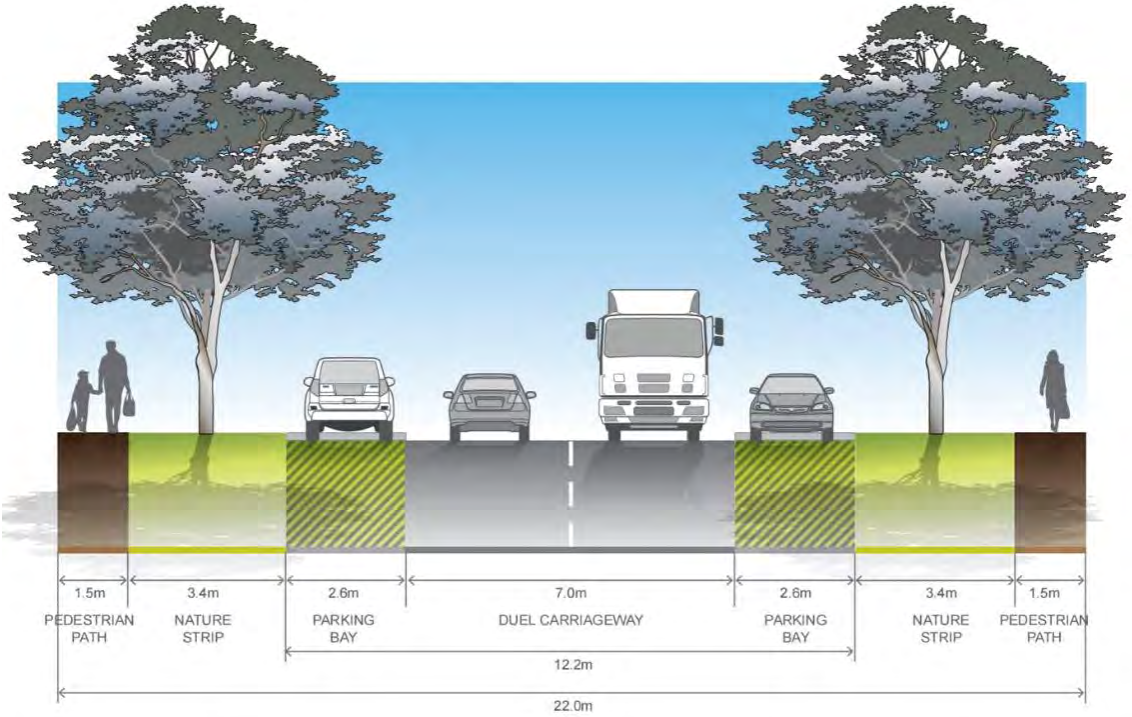


Figure 4.12: Indicative Cross-Section - McGibbonys Road

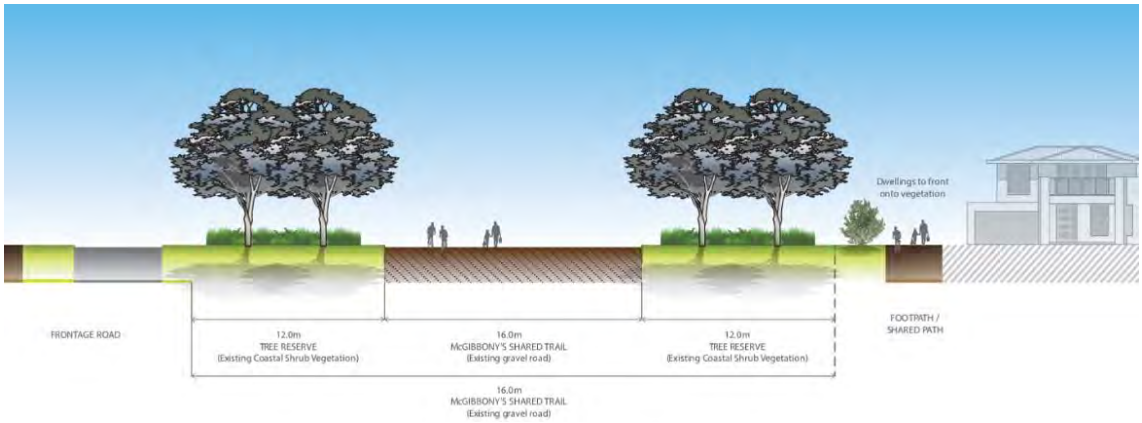
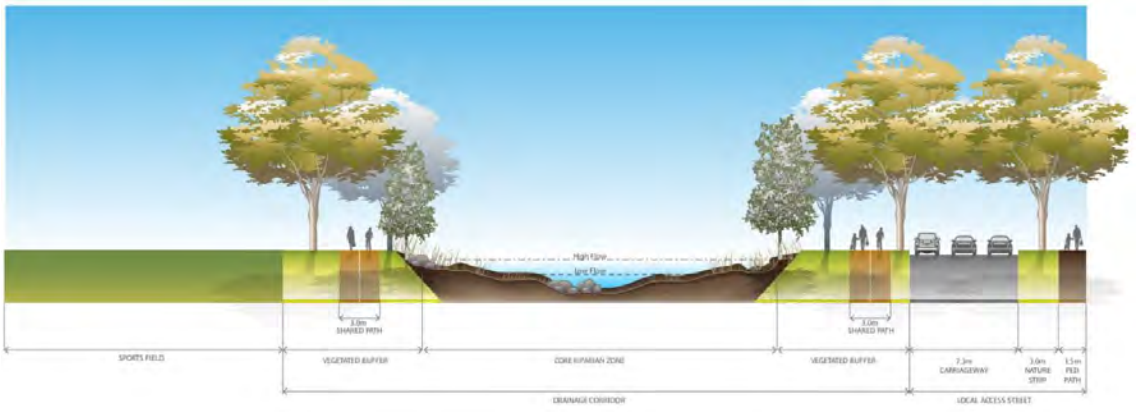


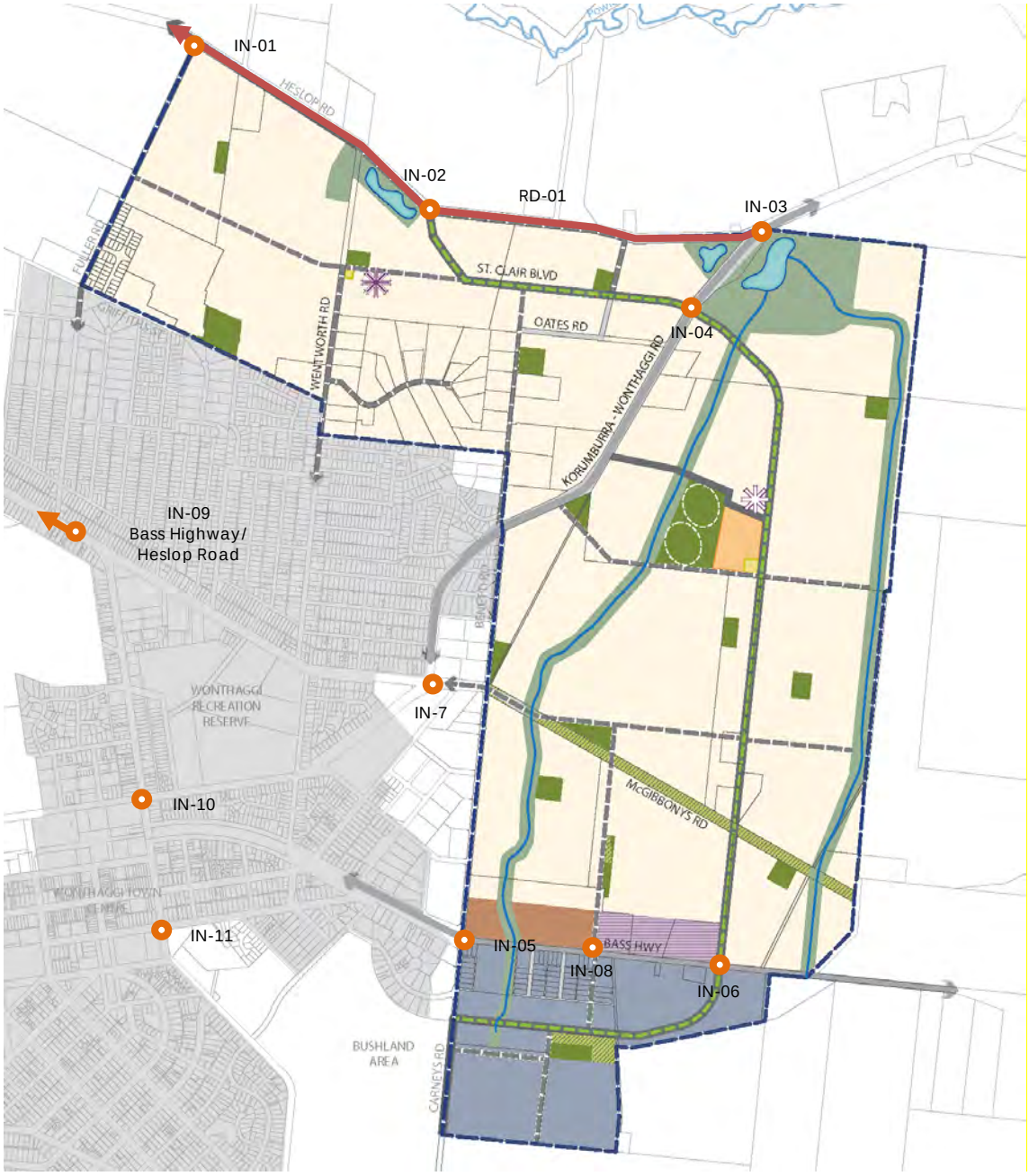
Figure 4.13: Indicative Cross-Section - Waterway



4.2.3 Proposed Intersection Layouts

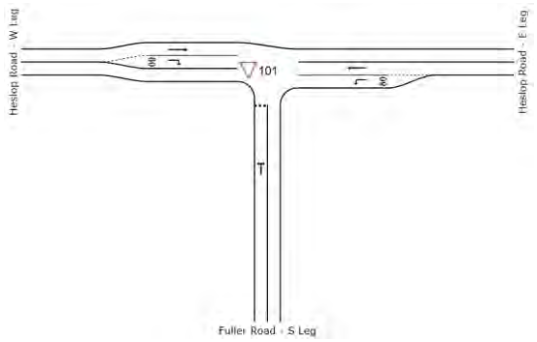
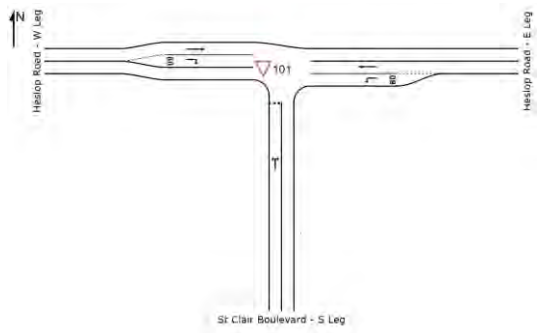
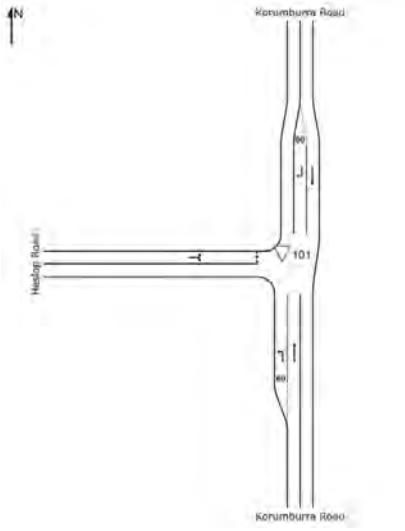
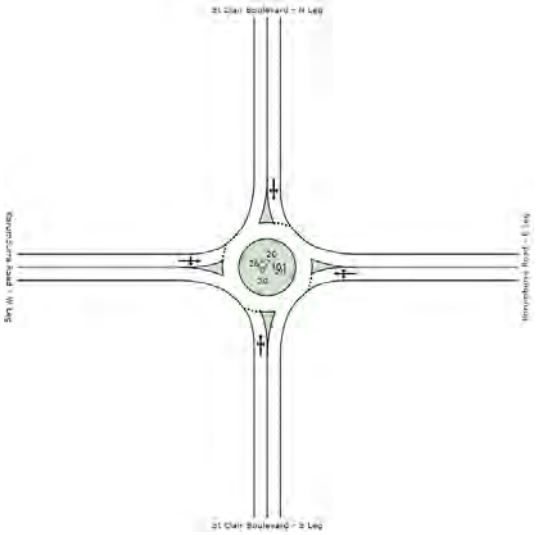
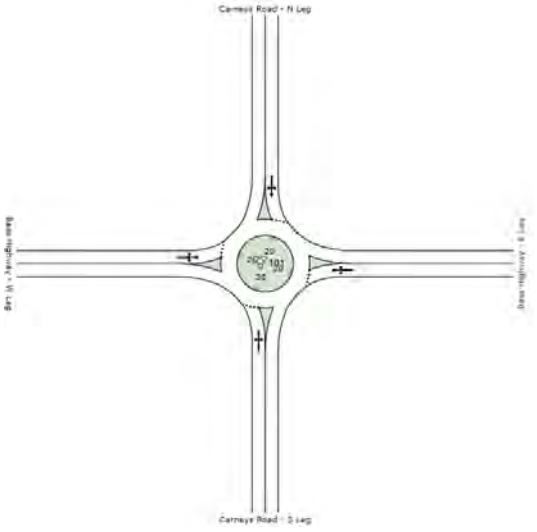
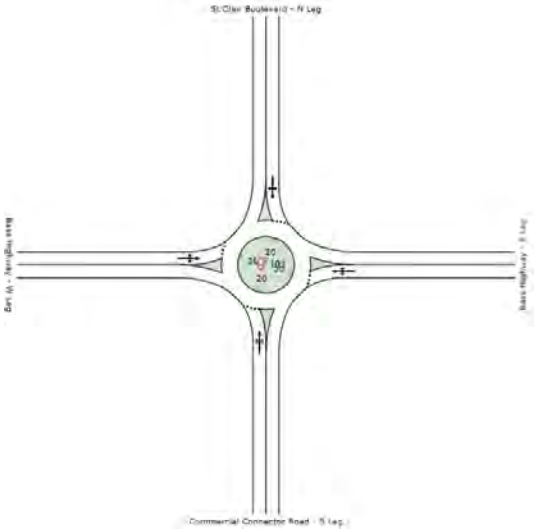
The indicative intersection layouts for each of the key intersections within and surrounding the PSP Area are presented in Table 4.2. The locations of each of the intersections within the PSP Area are shown in Figure 4.14. Each intersection has been identified as IN-01 to IN-11. The intersection control (signalised, roundabout, priority controlled, etc.) for each of the intersections has been determined having regard for the future traffic volumes, pedestrian activity and hierarchy of link.

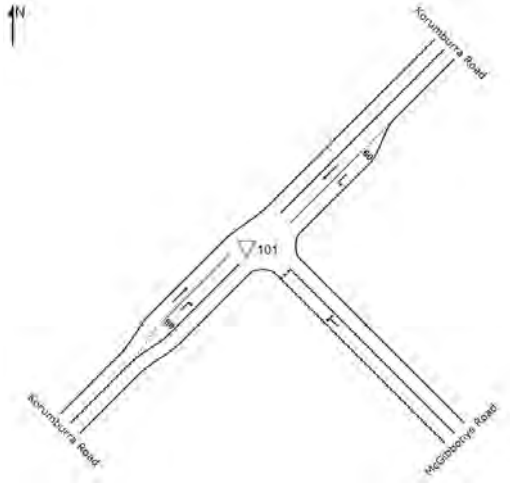
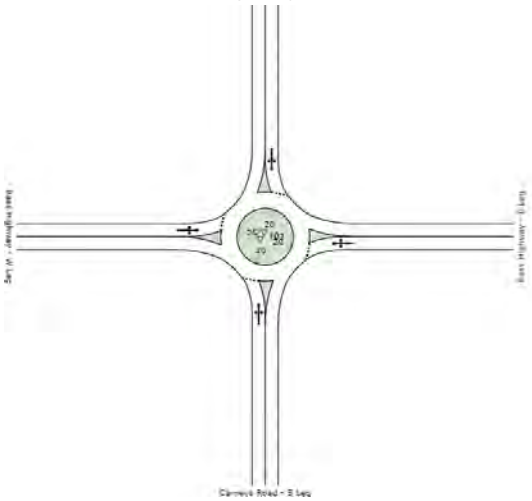
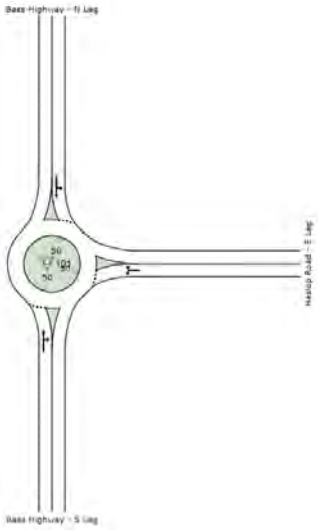
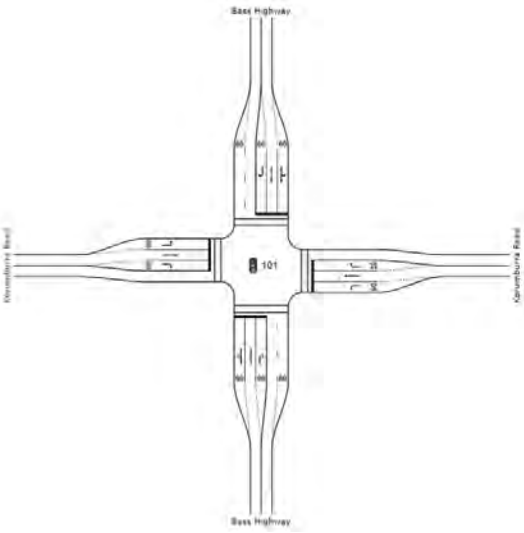
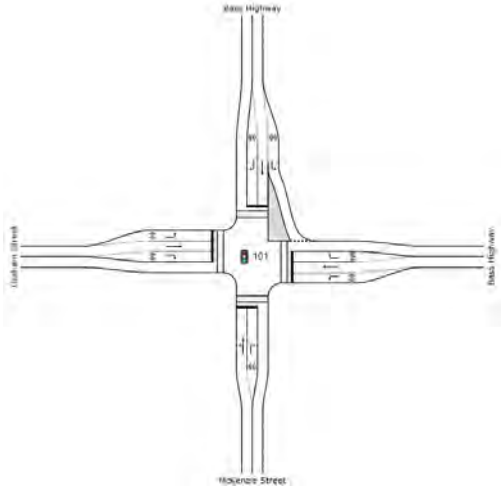
Figure 4.14: Overview of Intersections Modelled in SIDRA



It is noted that IN-09, IN-10 and IN-11 are located outside of the PSP Area and as such, these intersections will not be provided as part of the Wonthaggi North PSP or DCP.

Table 4.2: Summary of Proposed Intersection Treatments

Proposed Intersection Layout	
IN-01 Heslop Road / Fuller Road	IN-02 Heslop Road / St Clair Boulevard
	
IN-03 Korumburra Road / Heslop Road	IN-04 Korumburra Road / St Clair Boulevard
	
IN-05 Bass Highway / Carneys Road	IN-06 Bass Highway / St Clair Boulevard
	

Proposed Intersection Layout	
IN-07 Korumburra Road / McGibbonys Road [2]	IN-08 Bass Highway / John Street
	
IN-09 Bass Highway / Heslop Road (Future Ring Road)	IN-10 Bass Highway / Korumburra Road [1]
	
IN-11 Bass Highway / McKenzie Street / Graham Street	-
	

[1] The Bass Highway / Korumburra Road intersection layout is based on the layout proposed by VicRoads.

[2] Korumburra Road / McGibbonys Road is based on the layout proposed by TTM Consulting and approved by VicRoads.

4.3 Public Transport

The 'Public Transport: Guidelines for Land Use and Development' document prepared by the former Department of Transport (DoT) provides guidance on the recommended public transport provisions and coverage for new developments. Specifically, the document states the following for bus routes:

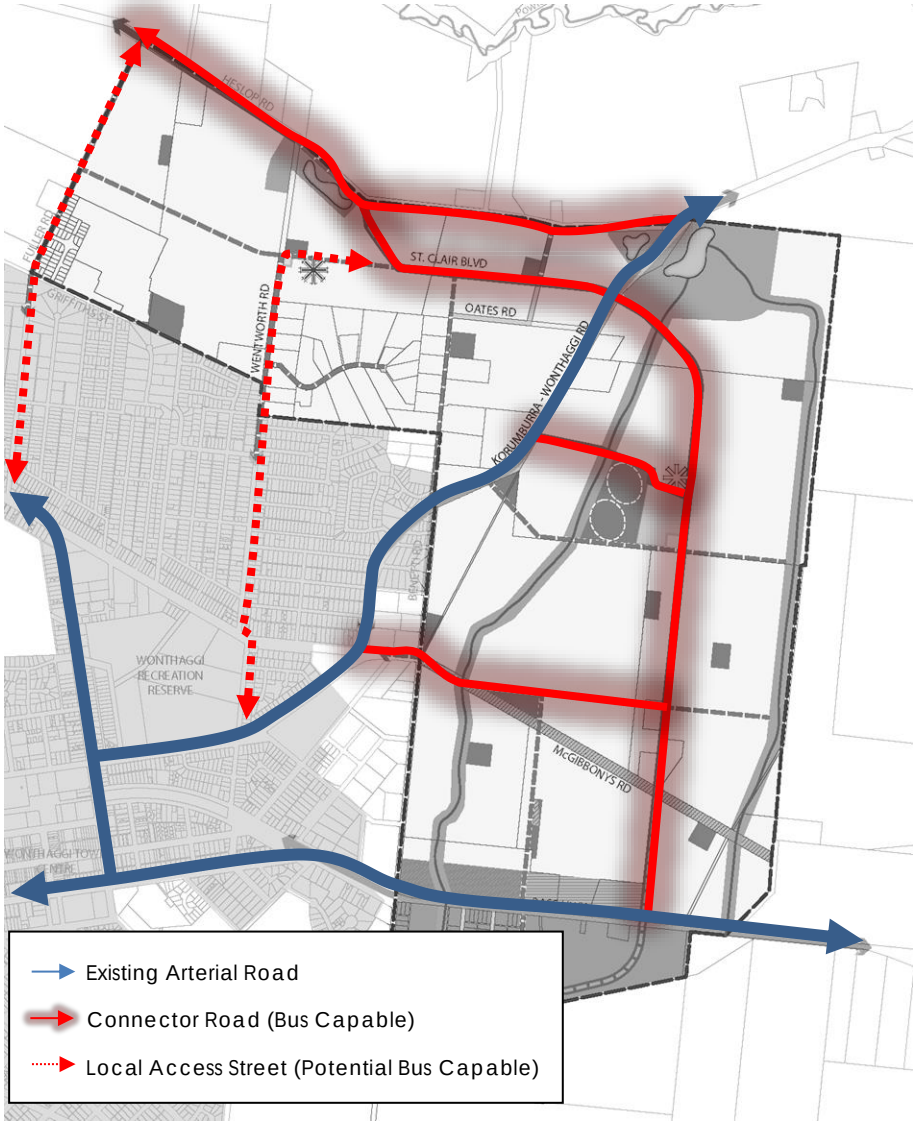
"Neighbourhoods should be designed for bus routes on strategically located connector roads so that dwellings will be within 400 metres of a bus route."

In this regard, the PSP Area includes a number of boulevard connector and standard connector roads that will be able to accommodate future bus services. There may also be opportunities to provide future bus services along Fuller Road and Wentworth Road connecting the PSP Area to the existing residential areas. Any bus routes along these roads may require modifications to the existing roads to ensure that buses can adequately travel along these routes (this could involve restricting on-street parking to one side of the carriageway only).

As detailed in Section 2, there are limited existing regular public transport facilities servicing the existing Wonthaggi township (i.e. inter-town or regional services only). As a result of the uplift in population from the PSP, a local bus servicing the PSP area and the existing township will become more viable.

The bus capable roads are illustrated in Figure 4.15.

Figure 4.15: PSP Bus Capable Roads



4.4 Cycling and Pedestrians

The proposed road cross-sections provided in Section 4.2.2 indicate that each of the proposed roads within the PSP Area would be configured with pedestrian facilities on both sides of the carriageway. The connector level roads would be configured with either on-road or shared path bike facilities. Additional shared paths are proposed along the open space/drainage corridors as well as on the south side of Heslop Road.

The bicycle and pedestrian facilities proposed to be delivered as part of the PSP Area should be integrated into the existing and proposed Council bicycle and pedestrian network.

A set of pedestrian operated signals is proposed on the Bass Highway approximately 150 to 200m east of the Bass Highway / Carneys Road intersection (IN-05). The proposed pedestrian operated signals would link the proposed shared path that runs north-south parallel to the drainage corridor. Traffic modelling presented later in this report indicates that the queueing on Bass Highway from the Carneys Road intersection would not extend to the proposed signals.

Signalised pedestrian crossings would be provided at the future Bass Highway / McKenzie Street / Graham Street (IN-07) and Bass Highway / Korumburra Road (IN-08) intersections. These future crossings would cater for pedestrians accessing the town centre from Wonthaggi North. Notwithstanding, there would be opportunities to provide additional pedestrian operated signals on Bass Highway linking the PSP Area to the western side of Bass Highway (i.e. to Wonthaggi Secondary College).

5. Transport Modelling

5.1 Strategic Modelling

5.1.1 VITM Model

Strategic transport modelling has been undertaken using the Victorian Integrated Transport Model (VITM) to understand the likely traffic increases as a result of the PSP on the existing surrounding and proposed future road network.

The Victorian Integrated Transport Model (VITM) is a tool developed by the Department of Economic Development, Jobs, Transport and Resources (DEDJTR) to assist in the planning of road and public transport infrastructure in Victoria. VITM is a multimodal strategic model that uses future population, employment and land use data projections to forecast travel behaviour and the impacts of changes to the road and public transport networks. VITM contains all major freeways, main arterials and connector roads. In this instance, the model has been refined to include a number of higher order access streets that exist in Wonthaggi.

The model is a link-based traffic model which is implemented in the CUBE Voyager software environment (developed by Citilabs). The model version that has been used for this project was obtained from DEDJTR in June 2016, version VITM2016_160317_V1_2. This is the latest release of the model from the DEDJTR and includes the most up-to-date land use forecasts and future road network projections.

5.1.2 Modelling Assumptions

The following assumptions have been made in the VITM review:

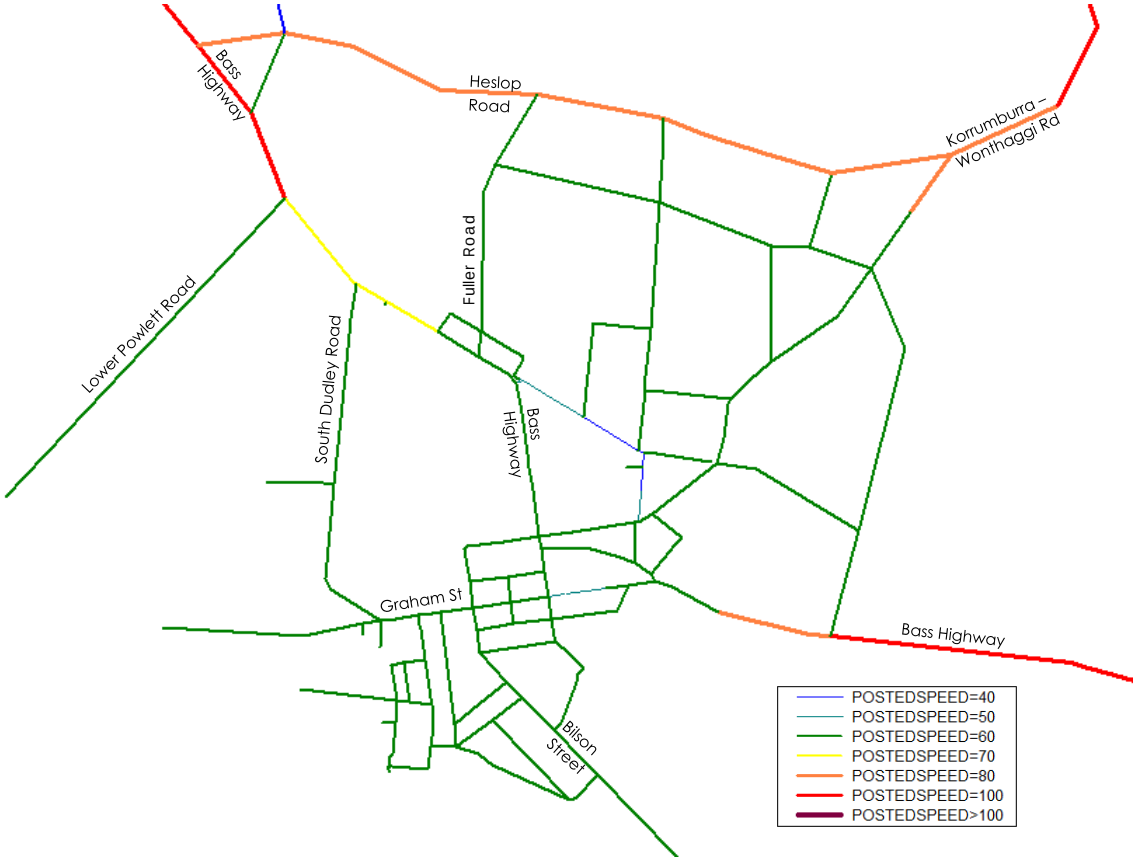
- Post development modelling to year 2046[3].
- Inclusion of the full build-out of the PSP including land use and road network.
- Three road network scenarios have been modelled, as follows:
  - No Ring Road (representing the PSP Area)
  - Fringe Alignment Ring Road
  - Kirrak Road Alignment Ring Road.

The ring road options have been presented to illustrate the potential traffic volume reductions on the road network through Wonthaggi town centre.

The modelled road network and assumed speeds for the PSP Area (no ring road) are presented in Figure 5.1. It is noted that each road link has been modelled as a single lane in each direction.

[3] This is a longest range modelling year available in VITM. In reality,,the PSP will likely be developed over a longer timeframe.

Figure 5.1: Modelled Road Network Configuration and Link Speeds



5.1.3 Land Use and Population Forecasts

The indicative land uses and yields for the PSP Area used for the transport modelling were agreed with Council and are presented in Table 5.1. The proposed dwellings, community centres and activity centres have been distributed into 8 zones throughout the PSP Area, which were used as the basis for the modelling. The zones are shown indicatively in Figure 5.2.

Figure 5.2: NGGA Modelling Zones Adopted in VITM

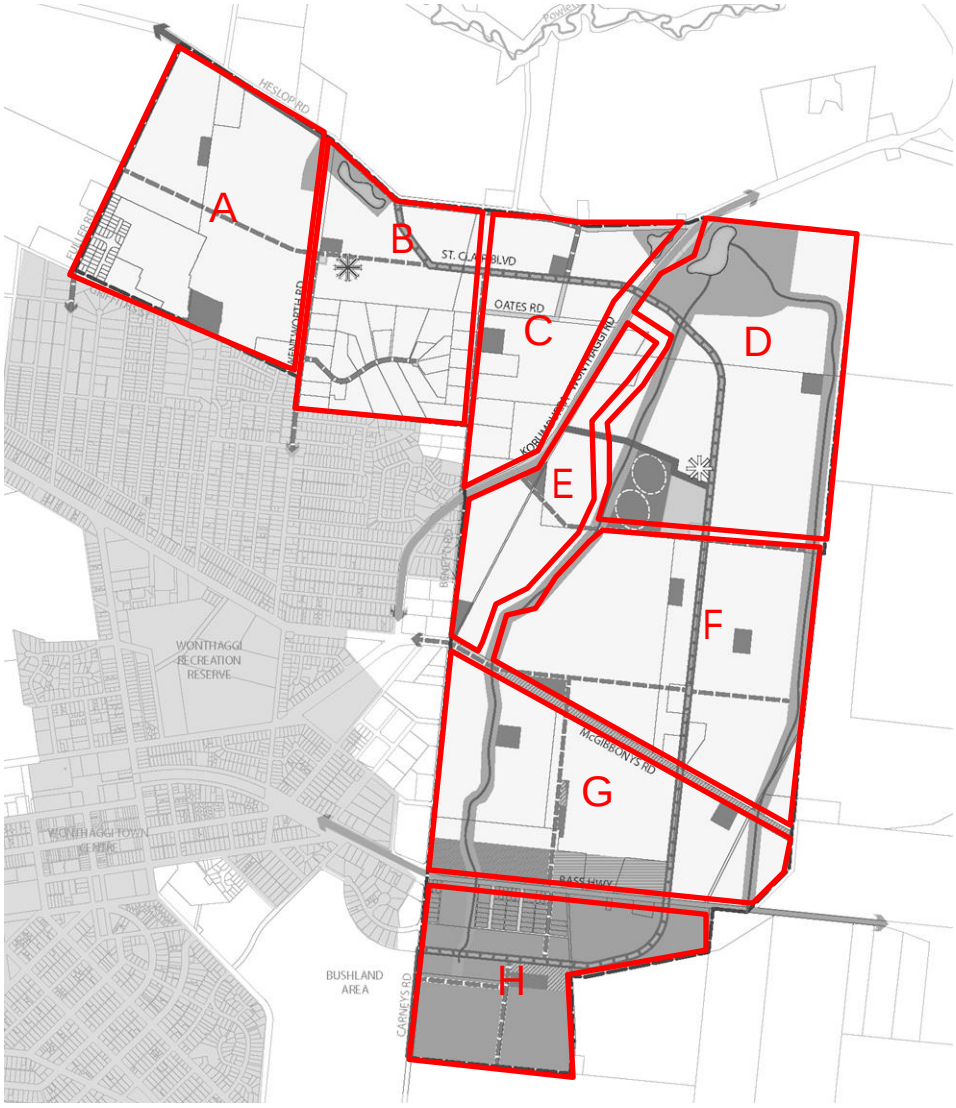


Table 5.1: NGGA Modelling Zones – Land Use Yield and Population Projections

Zone Number	No. of Dwellings	Community Centres	Activity Centre (sqm)
A	577	1	3,000sqm
B	395	-	-
C	352	-	-
D	631	1	3,000sqm
E	316	-	-
F	856	-	-
G	486	-	-
H	388	-	-
Total	4,000	2	6,000sqm

The dwellings have generally been distributed proportionally between the zones based on the size of each zone, whilst the indicative locations of the other uses has been agreed with Council officers. The community and activity centres have been coded into VITM as an overall number of antiipcated employees, rather than specific floor area estimates.

5.1.4 Traffic Generation Estimates

Estimates of the future traffic generation of the PSP Area have been extracted from VITM. The VITM traffic estimates are based on demographic, car ownership, mode share data and future land use forecasts.

The traffic generation shown in the model outputs only includes traffic that travels external to each modelling zone. Trips that occur entirely within a model zone (e.g. a trip from a house to a school or shops that are within the same zone) do not appear in the model outputs. Therefore, the overall daily traffic generation of each household will be higher than the trips shown in the model.

From the modelling, a summary of the anticipated external traffic generation from the indicative development scenario for the PSP Area as a whole is provided in Table 5.2.

Table 5.2: PSP Area External Traffic Generation Estimates

Period	Traffic Generation [1]		
	Productions	Attractions	Total
AM Peak Hour	3,050vpd	2,050vpd	5,100vpd
PM Peak Hour	2,350vpd	3,400vpd	5,750vpd
Daily	13,550vpd	13,750vpd	27,300vpd

[1] Presented values are for the no Ring Road 2046 option. Transport network options 1A and 1B will deliver similar values.

The PSP Area is broadly expected to generate in the order of 27,300 external vehicle movements per day. This value equates to approximately 6.8 vehicle movements per dwelling per day.

5.1.5 Road Network Volumes

A summary of the existing (2016) and post development (2046) daily traffic volumes on key internal and external road links following the full development of the PSP Area is presented in Figure 5.3 and Table 5.3, with full plots presented in Appendix B. The red dots on Figure 5.3 represent the count locations presented in Table 5.3.

Figure 5.3: VITM Daily Traffic Volume Plot – No Ring Road Option (Wonthaggi)

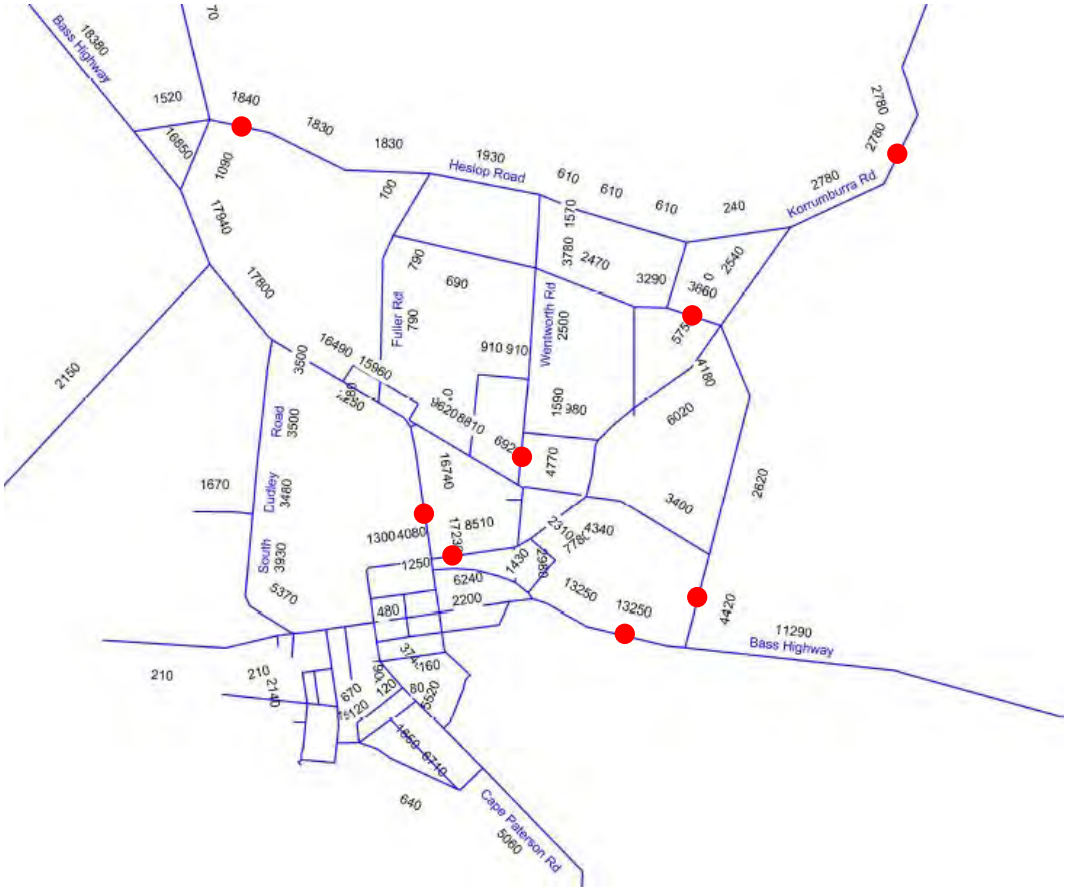


Table 5.3: Post Development (Year 2046) Traffic Volumes on Key Roads

Location	Daily Two-Way Traffic Volume 2046 (vpd)			
	2016 Existing Conditions	2046 No Ring Road	2046 Fringe Ring Road	2046 Kirrak Road Alignment
Bass Highway (east of town centre)	8,500	13,300	10,800	10,400
Bass Highway (north of town centre)	13,000	17,200	14,400	14,600
Ring Road (east of town)	NA	NA	3,100	2,600
Heslop Road / Ring Road (north of town)	NA	1,800	4,900	4,500
Korumburra Road (east of Bass Highway)	6,200	9,100	8,300	8,300
Korumburra Road (east of Heslop Road)	1,700	2,800	2,800	2,800
Saint Clair Boulevard (north of Bass Highway)	NA	4,400	2,500	2,900
Saint Clair Boulevard (west of Korumburra Road)	NA	3,700	3,700	4,200
Wentworth Road (north of Korumburra Road)	3,300	4,800	4,500	5,700

vpd denotes vehicles per day, rounded to the nearest 100vpd.

Table 5.3 indicates that the PSP Area is expected to result in significant increases in traffic volumes on key roads in the vicinity of the PSP Area compared with the 2016 existing volumes.

The modelling indicates that under the no ring road scenario that Bass Highway and Korumburra Road are predicted to experience the greatest increases in traffic volumes (i.e. roughly double their existing levels).

St Clair Boulevard is predicted to carry daily traffic volumes of between 2,500 and 4,400vpd, whilst daily traffic volumes on Wentworth Road (north of Korumburra Road) are predicted to increase by 1,500vpd.

Whilst not proposed as part of the PSP, should a ring road eventually be delivered, it is predicted that only modest traffic volume increases would occur on Bass Highway and Korumburra Road in the town centre when compared with the existing conditions.

5.1.6 Peak Hour Volumes

The daily link plot traffic volumes have been converted to peak hour turning movements with the outputs presented in Appendix C. The peak hour traffic volumes have been developed having regard for the following:

- Interpolation of the strategic modelling (i.e. daily link plots)
- Factoring up the existing traffic volume counts by the percentage difference between the 2016 and 2046 modelling scenario outputs
- Applying a 10% peak hour to daily ratio to the strategic modelling link plots
- Engineering judgement (i.e. reassigning traffic following the signalisation of Bass Highway and Korumburra Road).

The resultant peak hour traffic volume estimates have been used to inform the detailed intersection modelling.

5.2 SIDRA Intersection Modelling

The future operation of key intersections has been assessed using *SIDRA INTERSECTION 7*[4], a computer based modelling package which calculates intersection performance.

The commonly used measure of intersection performance is referred to as the *Degree of Saturation (DOS)*. The DOS represents the flow-to-capacity ratio for the most critical movement on each leg of the intersection. For signalised intersections and roundabouts, a DOS of around 0.95 has been typically considered the 'ideal' limit (or 0.90 for unsignalised intersections), beyond which queues and delays increase disproportionately[5]. The Level of Service (LOS) for an intersection is determined based on the DOS of the intersection, with the parameters set out at the bottom of the page.

Table 5.4 presents a summary of the anticipated operation of the intersections identified above, with full results presented in Appendix D of this report. The SIDRA models have been prepared assuming the intersection layouts presented in Table 4.2.

[4] Program used under license from Akcelik & Associates Pty Ltd.

[5] SIDRA INTERSECTION adopts the following criteria for Level of Service assessment:

Level of Service		Intersection Degree of Saturation (DOS)		
		Unsignalised Intersection	Signalised Intersection	Roundabout
A	Excellent	<=0.60	<=0.60	<=0.60
B	Very Good	0.60-0.70	0.60-0.70	0.60-0.70
C	Good	0.70-0.80	0.70-0.90	0.70-0.85
D	Acceptable	0.80-0.90	0.90-0.95	0.85-0.95
E	Poor	0.90-1.00	0.95-1.00	0.95-1.00
F	Very Poor	>=1.0	>=1.0	>=1.0

Table 5.4: SIDRA INTERSECTION Post Development Operation

No.	Intersection	Peak Hour	DOS	Average Delays (secs)	95th Percentile Queue (m)
IN-01	Heslop Road / Fuller Road	AM	0.06	2	1
		PM	0.06	2	1
IN-02	Heslop Road / St Clair Boulevard	AM	0.14	4	4
		PM	0.07	4	2
IN-03	Korumburra Road / Heslop Road	AM	0.14	2	3
		PM	0.11	2	2
IN-04	Korumburra Road / St Clair Boulevard	AM	0.33	7	15
		PM	0.55	7	34
IN-05	Bass Highway / Carneys Road	AM	0.84	11	119
		PM	0.82	9	95
IN-06	Bass Highway / St Clair Boulevard	AM	0.74	9	74
		PM	0.75	8	71
IN-07	Korumburra Road / McGibbonys Road	AM	Not assessed as part of this study (Refer to Section 5.4.4)		
		PM			
IN-08	Bass Highway / John Street	AM	Not assessed as part of this study [1]		
		PM			
IN-09	Bass Highway / Heslop Road	AM	0.77	4	14
		PM	0.59	3	49
IN-10	Bass Highway / Korumburra Road	AM	0.90	44	251
		PM	0.92	42	257
IN-11	Bass Highway / McKenzie Street / Graham Street	AM	0.90	47	138
		PM	0.99	67	280

[1] Specific modelling of this intersection has not been completed as part of this study, however, the intersection is expected to operate similarly to IN-05 and IN-06 which are also configured as single lane roundabouts.

As described earlier, a DOS of around 0.95 for signalised intersections and 0.90 for unsignalised intersections has traditionally been considered the practical limit beyond which intersection performance is unsatisfactory, as beyond this value queues and delays increase disproportionately. On this criterion, the calculated DOS suggest that the nominated intersections can generally be expected to operate satisfactorily following full development of the PSP. It is noted that the Bass Highway / Korumburra Road and Bass Highway / McKenzie Street / Graham Street intersections are both predicted to be operating near their capacities (further discussion regarding this is provided in the following sections). Typically, when an intersection is operating at or near its capacity vehicles seek to take alternate routes. In this instance that could include a future ring road or alternatively using the local road network to avoid these intersections.

The post development level of service (based on DOS) for each of the intersections for the AM and PM peak hours is presented in Figure 5.4 and Figure 5.5.

Figure 5.4: Overview of AM Peak Hour – Intersection Level of Service

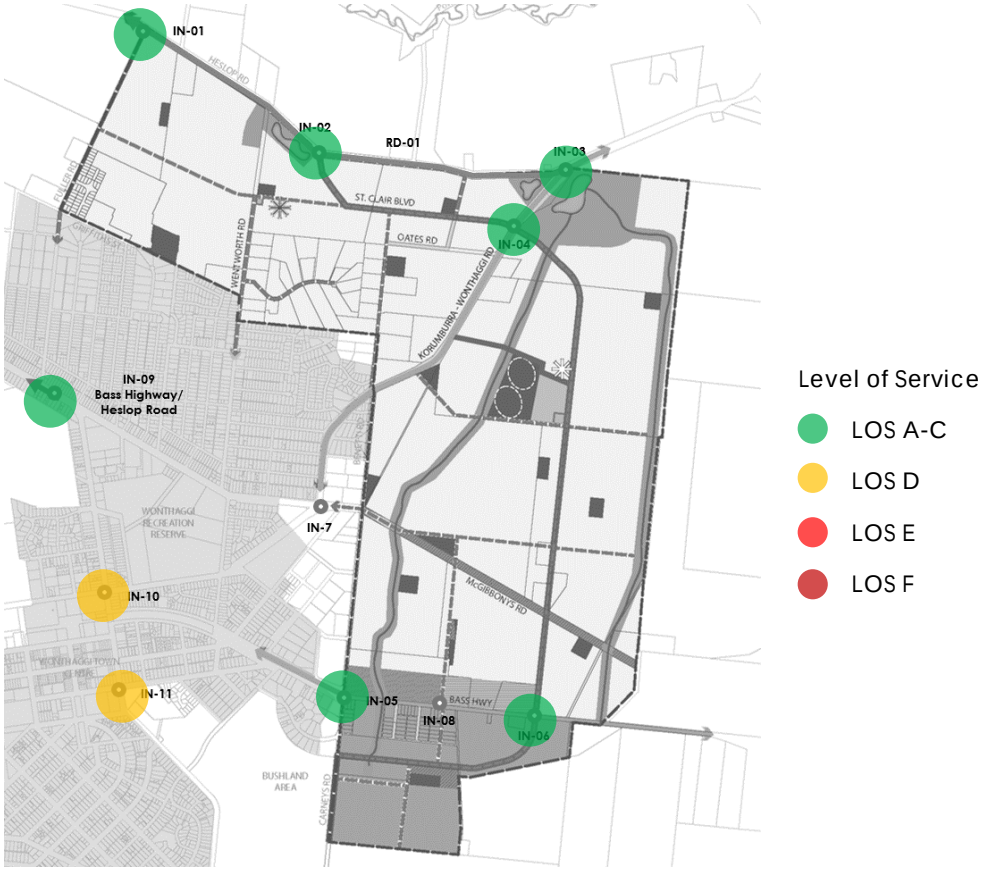
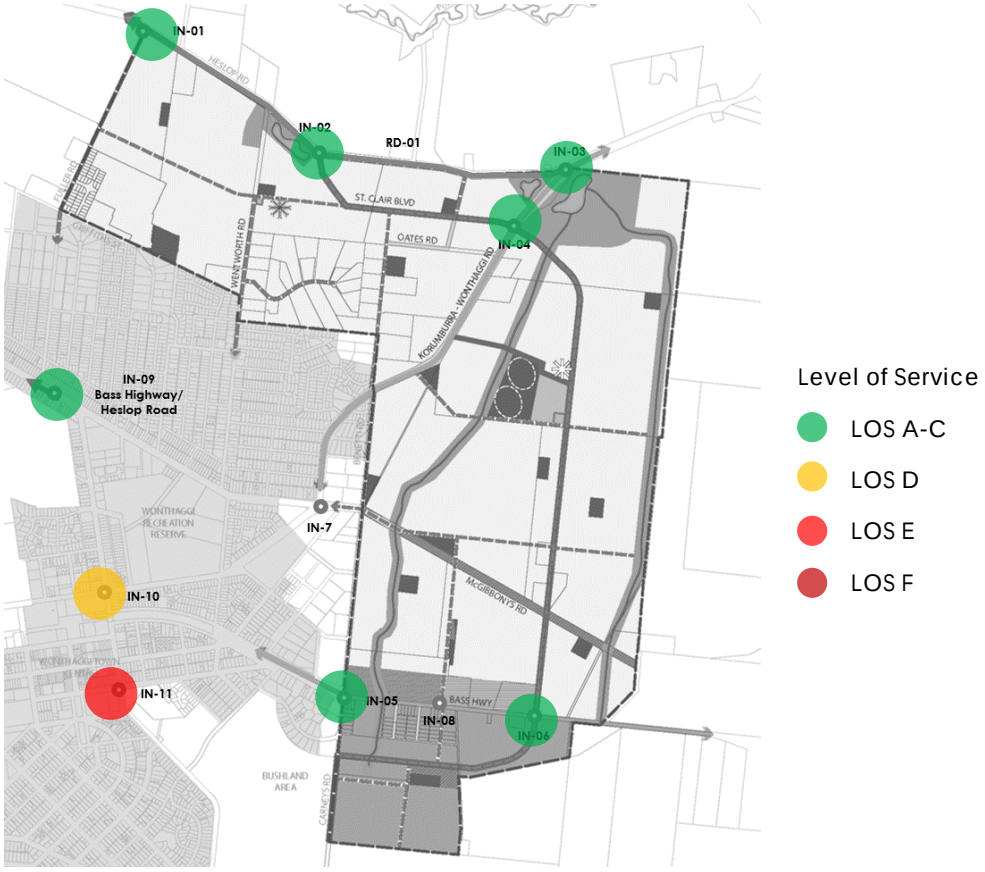


Figure 5.5: Overview of PM Peak Hour – Intersection Level of Service



5.3 Midblock Capacity

The midblock capacity assessment assesses the forecast future traffic demands against the indicative two-way volume capacity of a road. The capacity of each road varies depending on a number of factors, such as number of traffic lanes, carriageway width, property access, on-street car parking, land use frontages, etc. The future indicative capacities of each of the roads have been sourced from Austroads, VPA and Clause 56.06 of the Bass Coast Planning Scheme.

An assessment of the midblock capacity of the key roads within and surrounding the PSP Area has been undertaken with a summary of the results provided in Table 5.5.

Table 5.5: Midblock Capacity Assessment

Road (Location)	Indicative Daily Capacity	Daily Traffic Volume (vpd)			Adequacy of Road Link
		Existing (2016)	Additional	Post Development (2046)	
Bass Highway (east of town centre)	~18,000vpd	8,500	+4,800	13,300	✓
Bass Highway (north of town centre)	~18,000vpd	13,000	+4,200	17,200	✓
Heslop Road / Ring Road (north of town)	~7,000vpd	<100	+1,700	1,800	✓
Korumburra Road (east of Bass Highway)	~18,000vpd	6,200	+2,900	9,100	✓
Korumburra Road (east of Heslop Road)	~18,000vpd	1,700	+1,100	2,800	✓

Road (Location)	Indicative Daily Capacity	Daily Traffic Volume (vpd)			Adequacy of Road Link
		Existing (2016)	Additional	Post Development (2046)	
Saint Clair Boulevard (north of Bass Highway)	~7,000vpd	NA	+4,400	4,400	✓
Saint Clair Boulevard (west of Korumburra Road)	~7,000vpd	NA	+3,700	3,700	✓
Wentworth Road (north of Korumburra Road)	~7,000vpd	3,300	+1,500	4,800	✓

Table 5.5 indicates that each of the key roads within and surrounding the PSP Area is anticipated to operate within their theoretical daily volume capacities, noting that Bass Highway (north of the town centre) is approaching capacity.

5.4 Other Considerations

5.4.1 Bass Highway Capacity

Following the development of the PSP area (and assuming no ring road) Bass Highway is predicted to carry almost 18,000vpd. Based on Austroads design guidance, an arterial road with a single lane in each direction has a theoretical traffic volume capacity in the order of 18,000 vehicles per day. In reality, a road with a single lane in each direction can carry up to 20,000 to 25,000vpd prior to additional through capacity being required (i.e. duplication). However, it will become increasingly difficult for vehicles to enter Bass Highway from the side roads at priority controlled intersections as the daily traffic volumes increase. Localised capacity enhancements (above those identified in this report) may be required at intersections along the corridor to maintain sufficient access to the lower order road network.

The capacity constraint on the Bass Highway corridor is reflected in Figure 5.4 and Figure 5.5 which indicate that the two main intersections within the town centre will be operating with LOS D or worse during the AM and PM peak hours.

5.4.2 Ring Road Requirement / Seasonal Traffic Volumes

The expectant future traffic volumes on Bass Highway immediately north of the town centre are 18,400vpd without the ring road. As discussed above, the Bass Highway corridor is anticipated to be operating at or near capacity without the ring road.

This will be exacerbated during busier summer months when traffic volumes in the region increase. During these infrequent events increased queues and delays will be experienced along the Bass Highway intersections.

The expectant future traffic volumes on Bass Highway immediately north of the town centre are 14,600vpd with the ring road on the Kirrak Road alignment (preferred option).

The strategic modelling indicates that with the ring road (either alignment) the traffic volumes through the town centre reduce significantly such that each of the intersections within the town centre would operate with a LOS C or better. Indeed, the daily traffic volumes on the Bass Highway corridor would only experience modest increases if the ring road is provided. This suggests that the lower order intersections provided along the corridor would continue to operate at similar levels to currently experienced without the need for further capacity enhancement works should the ring road be provided.

5.4.3 Bass Highway / Korumburra Road Intersection (IN-10)

Since the initial preparation of this report, the upgraded signalised intersection has been delivered by Regional Roads Victoria.

5.4.4 Korumburra Road / McGibbonys Road (IN-07)

The intersection requirements and resultant operation of the Korumburra Road / McGibbonys Road intersection have been assessed by TTM Consulting as part of a separate subdivision planning permit application.

The identified intersection layout includes chanellised left and right turn lanes on Korumburra Road and a shared left and right turn lane on McGibbonys Road. Reference to the turn lane warrants presented in the Austroads Guide (Part 4a Unisgnalised Intersections) against the anticipated future traffic volumes at the intersection suggests that the proposed intersection geometry is appropriate. Furthermore, it is understood that VicRoads has approved the functional layout plan for the intersection.

Therefore, the operation of the intersection has not been re-assessed as part of this study.

6. Intersection Concept Layouts and Costings

6.1 Concept Layouts

GTA has prepared concept layout plans for each of the key intersections within and surrounding the PSP Area. The concept layout plans are provided in Appendix E. Additionally, the recommended initial and ultimate future cross-sections of Bass Highway between Carneys Road and St Clair Boulevard are also provided in Appendix E.

Generally, the concept designs have been prepared in accordance with the requirements of the relevant Austroads Guides, including the Austroads Guide to Road Design Part 4A: Unsignalised Intersections and Part 4B: Roundabouts. A summary of the design considerations that have informed the concept designs is provided below:

- The desirable minimum dimensions have generally been adopted from the Austroads Guide.
- The designs seek to minimise any third-party land acquisition requirements.
- The designs seek to minimise infrastructure requirements.
- Incorporate design recommendations from Regional Roads Victoria (September 2020).

A summary of the design considerations is provided on each of the concept layout plans (including design speed, design vehicle, etc.).

6.2 Costings

GTA has prepared opinions of probable cost for each of the intersections. The opinions of probable cost have been based on the following assumptions and exclusions:

Assumptions:

- A 10% project management fee has been applied to all estimates
- A 30% contingency has been applied as the order of magnitude estimates have been based on desktop study only.
- Asphalt re-sheeting has been included for the approaches of the intersection only.
- Price escalation is not included in the estimate.
- No allowance has been made for night-works if required.

Exclusions:

- Design and documentation fees or authority fees, charges, levies and overview including insurances, bank guarantees.
- Existing services relocations and facilitation including lowering or realignment thereof[6].
- Protection of underground services during construction.
- Land acquisition.
- Any allowance for abnormal weather conditions.

The opinion of probable cost for each intersection is provided in Table 6.1, with a detailed breakdown of the costs also provided at Appendix E.

[6] Excluding IN-04, IN-05 and IN-06 which include options with an opinion of probable cost for service relocation included.

Table 6.1: Opinion of Probable Costs (based on 2020 estimates)

Intersection No.	Intersection Name	Opinion of Probable Cost	
		Without Contingency	With Contingency
IN-01	Heslop Road / Fuller Road	$874,000	$1,136,000
IN-02	Heslop Road / St Clair Boulevard	$1,008,000	$1,310,000
IN-03	Korumburra Road / Heslop Road	$993,000	$1,291,000
IN-04	Korumburra Road / St Clair Boulevard	$1,300,000	$1,690,000
	Korumburra Road / St Clair Boulevard [including allowance for service relocation]	$1,890,000 [1]	$2,280,000 [1]
IN-05	Bass Highway / Carneys Road	$1,378,000	$1,791,000
	Bass Highway / Carneys Road [including allowance for service relocation]	$2,273,000 [1]	$2,686,000 [1]
IN-06	Bass Highway / St Clair Boulevard	$1,923,000	$2,500,000
	Bass Highway / St Clair Boulevard [including allowance for service relocation]	$2,173,000 [1]	$2,750,000 [1]
IN-07	Korumburra Road / McGibbonys Road [2]	$1,308,000	$1,701,000
IN-08	Bass Highway / John Street	$1,331,000	$1,730,000
RD-01	Heslop Rd (from Fuller Rd to Korumburra-Wonthaggi Rd)	$2,521,000	$3,277,000

[1] Adopting the average of the lower and upper estimates for the service relocation cost estimates.
[2] Includes construction of 245m of McGibbonys Road.

The approximate service relocation estimates for IN-04, IN-05 and IN-06 have been estimated. A summary of the each of the service relocation estimates, including a lower, upper and mid estimate, is provided in the following tables.

Table 6.2: Service Relocation Cost Estimates -IN-04 (based on 2020 estimates)

Service Provider	Comments / Notes	Service Relocation Cost Estimate		
		Lower Estimate	Upper Estimate	Mid
Communication services (Telstra and NBN)	Existing conduits are located at northern and southern sides of Korumburra Road and these may need to be protected or relocated due to proposed roundabout leg on eastern and western side. Most likely, these Telstra conduits need to be lowered or relocated. No NBN found in this area	$50,000	$150,000	$100,000
Gas	150mm diameter gas main is located at northern side of Korumburra Road. This gas main need to be protected or lowered as required from authority.	$50,000	$100,00	$75,000
Electricity	No electrical services located within the vicinity of proposed roundabout. However, there is overhead electricity crossing found across proposed St Clair Boulevard on northern side of Korumburra Road. Impact on this overhead electricity is unknown at this stage. However future alignment of St Clair Boulevard can have slight amendment to avoid existing electrical pole.	$80,000	$150,000	$115,000
Water and sewer	500mm DICL water main is located at southern side of Korumburra Road. This s larger water main (may be a transmission main) and may need a special protection as per authority requirement. No sewer main is located within the vicinity of the works.	$200,000	$400,00	$300,000
Total		$380,000	$800,000	$590,000

Note: This is a broad level estimate only, subject to verification by authority

Table 6.3: Service Relocation Cost Estimates – IN-05 (based on 2018 estimates)

Service Provider	Comments / Notes	Service Relocation Cost Estimate		
		Lower Estimate	Upper Estimate	Mid
Telecommunications (Telstra)	Excludes NBN costs	$80,000	$100,000	$90,000
Electricity (Ausnet Services)	Relocation of 3 poles within the proposed intersection	$70,000	$100,000	$85,000
NBN (NBN Co)	Final fee estimate will be subject to the complexity related to relocation of Telstra's conduits	$80,000	$100,000	$90,000
Water (South Gippsland Water)	Includes relocation of three x 200mm AC water mains (north-south) that supply Wonthaggi and one x 100mm PVC pipe (east-west). Fee range is dependent on the depth of the existing pipes that are to be relocated (this can only be confirmed on-site with service proofing and detailed design).	$200,000	$1,000,000	$600,000
Gas (Multinet Gas)	For protection works within service road and across the southern leg of the proposed roundabout	$20,000	$40,000	$30,000
Total		$450,000	$1,340,000	$895,000

Note: This is a broad level estimate only, subject to verification by authority

Table 6.4: Service Relocation Cost Estimates -IN-06 (based on 2020 estimates)

Service Provider	Comments / Notes	Service Relocation Cost Estimate		
		Lower Estimate	Upper Estimate	Mid
Communication services (Telstra and NBN)	Existing conduits are located at northern and southern sides of Bass Highway and these may need to be protected or relocated. No NBN found in this area	$100,000	$200,000	$150,000
Gas	No gas services located within the vicinity of proposed roundabout.	-	-	-
Electricity	No electrical services located within the vicinity of proposed roundabout. However, there is an electrical pole located at the western side of proposed roundabout. This may need to be protected or avoided with future design.	$20,000	$30,000	$25,000
Water and sewer	100mm PVC water main is located at northern side of Bass Highway. No sewer main is located within the vicinity of the works.	$50,000	$100,000	$75,000
Total		$170,000	$330,000	$250,000

Note: This is a broad level estimate only, subject to verification by authority

The above engineer's opinion of probable cost is for initial planning only and must not be relied upon for quoting, budgeting or construction purposes. It is recommended that you seek a detailed cost estimate from a suitably qualified quantity surveyor following further design development.

Appendix A

Site Photos

Figure A.1: Wentworth Road – Looking North

Figure A.2: Heslop Road – Looking East

Figure A.3: Korumburra Road – Looking West

Figure A.4: Bass Highway – Looking North

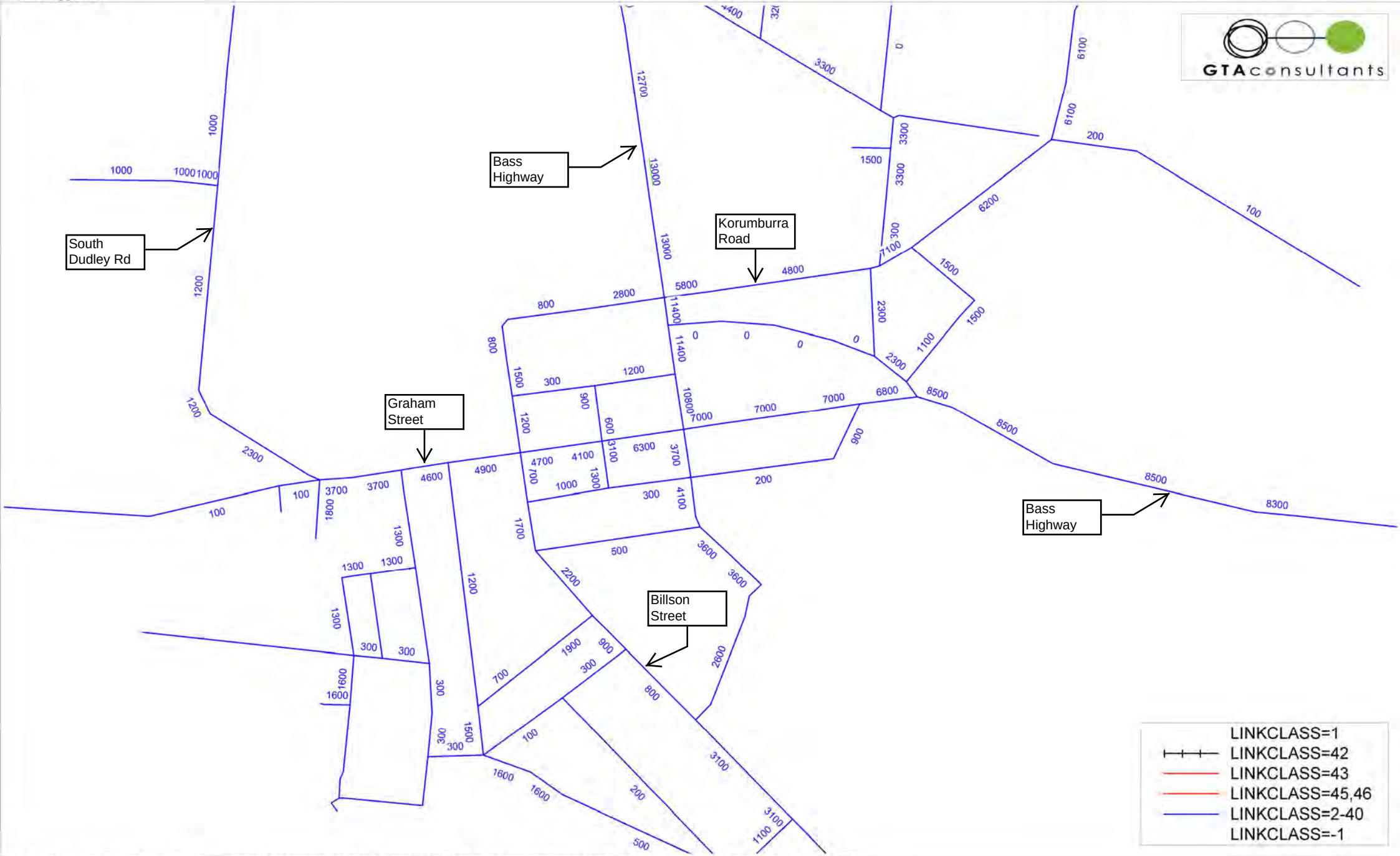
Figure A.5: Fuller Road – Looking North

Figure A.6: Oates Road – Looking South

Appendix B

VITM Daily Traffic Volume Plots

Statewide Victorian Integrated Transport Model (SVITM)
Daily Vehicle Volume Year 2016
Base Case
Wonthaggi CBD



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28/03/2017

cube

Statewide Victorian Integrated Transport Model (SVITM)
V106370 - Wonthaggi North PSP
2016 Base Case - Daily Volume Plot

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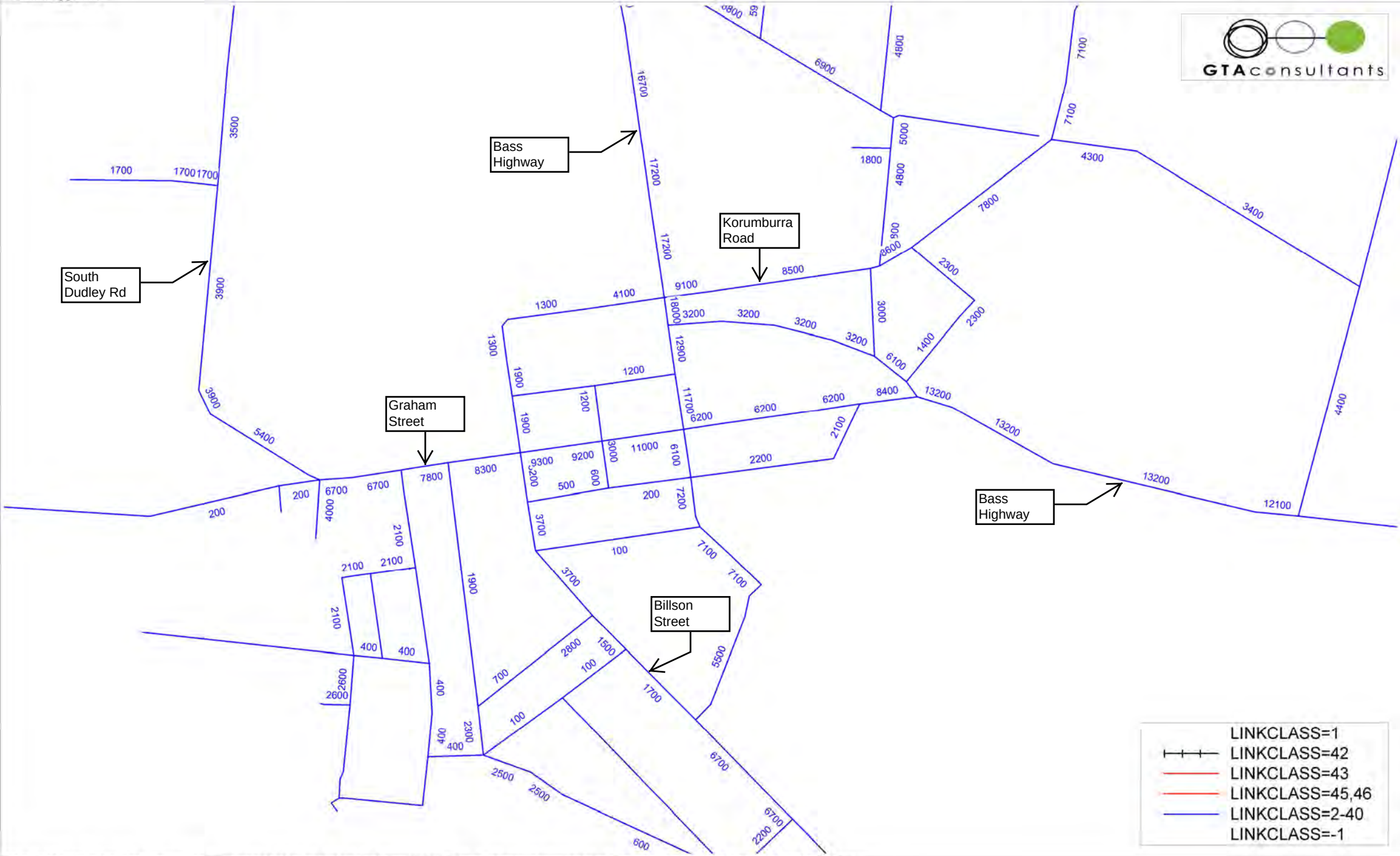
4/04/2017

Statewide Victorian Integrated Transport Model (SVITM)
Daily Vehicle Volume Year 2046
Reference Case
Wonthaggi CBD



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28/03/2017

cube

Statewide Victorian Integrated Transport Model (SVITM)
V106370 - Wonthaggi North PSP
2046 Reference Case - Daily Volume Plot

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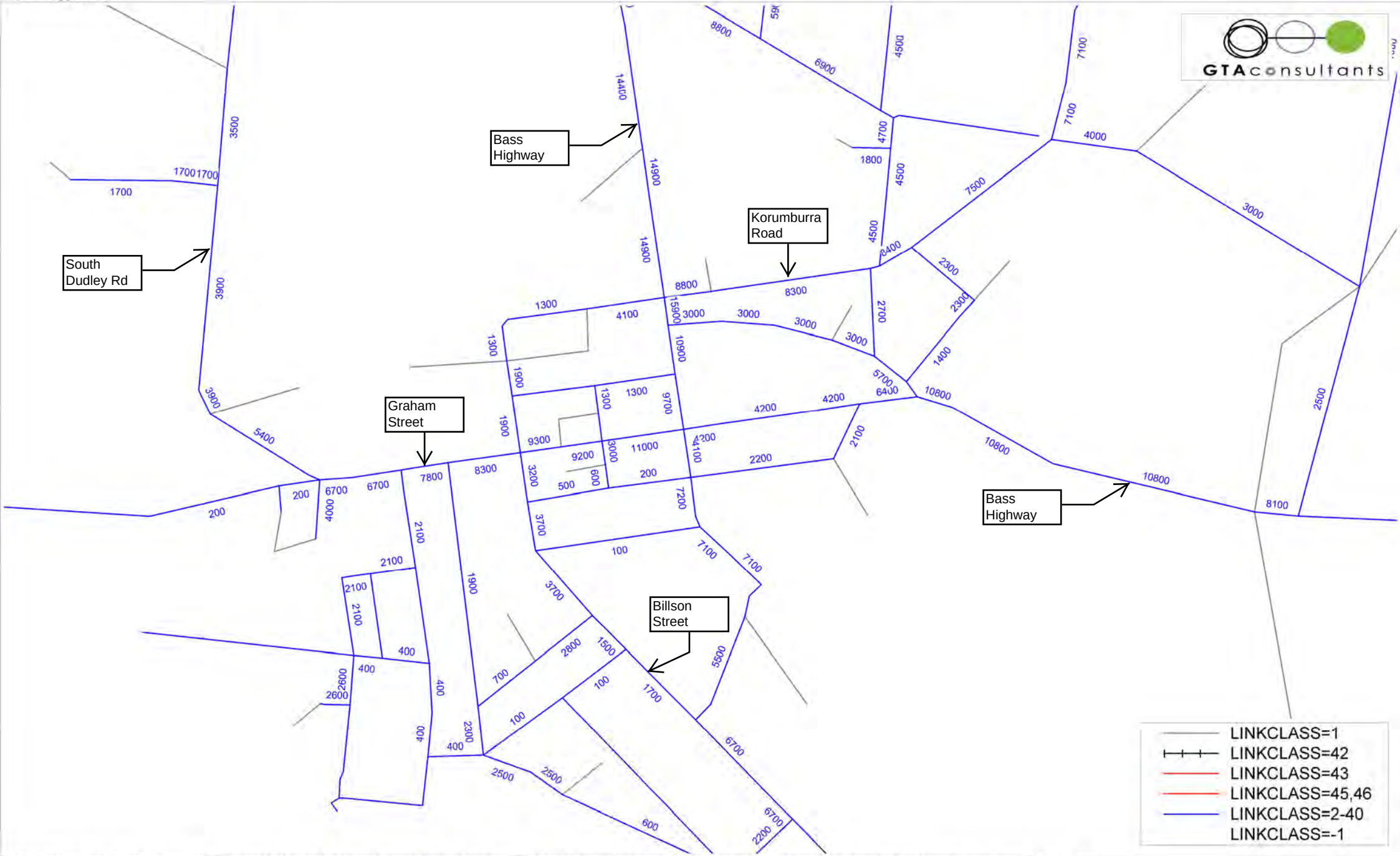
4/04/2017

cube

Statewide Victorian Integrated Transport Model (SVITM)
Daily Vehicle Volume Year 2046
Growth Area Fringe Bypass Option
Wonthaggi CBD



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28/03/2017

cube

Statewide Victorian Integrated Transport Model (SVITM)
V106370 - Wonthaggi North PSP
2046 Growth Area Fringe Bypass Option - Daily Volume Plot

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4/04/2017

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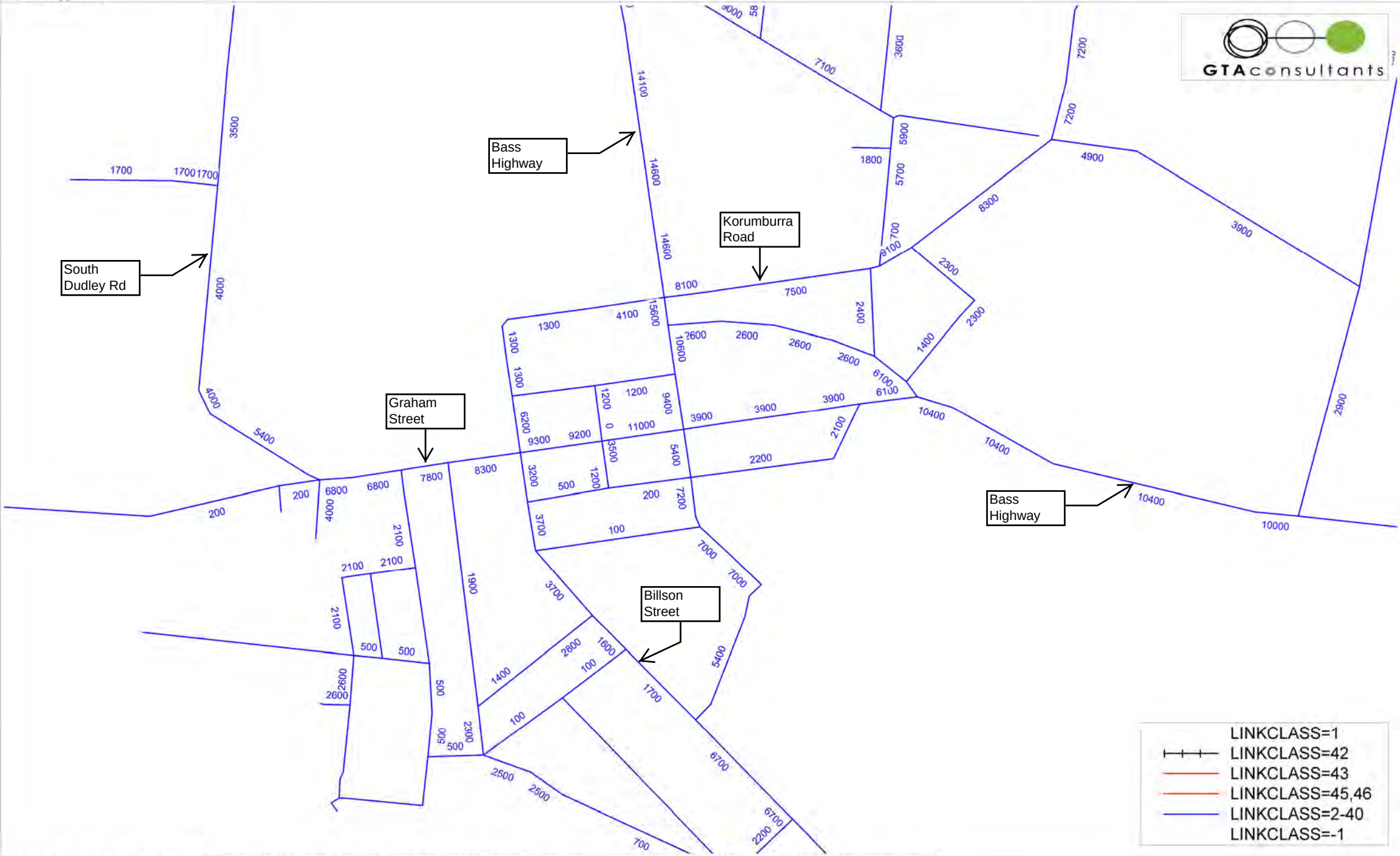
Statewide Victorian Integrated Transport Model (SVITM)
Daily Vehicle Volume Year 2046
Kirrak Road Bypass Option
Wonthaggi CBD



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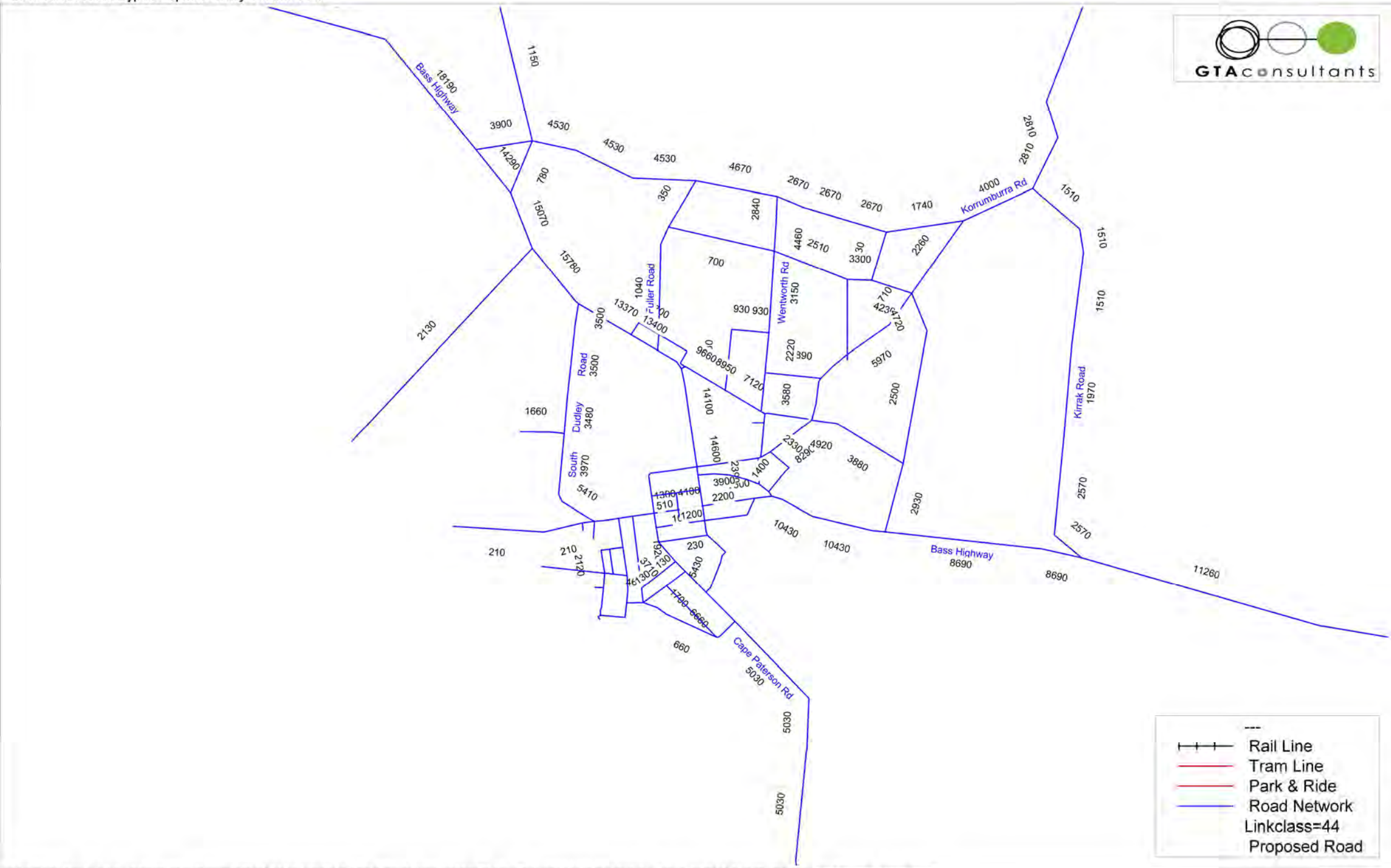
28/03/2017

cube

Statewide Victorian Integrated Transport Model (SVITM)
V106370 - Wonthaggi North PSP
2046 Kirrak Road Bypass Option - Daily Volume Plot



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4/04/2017

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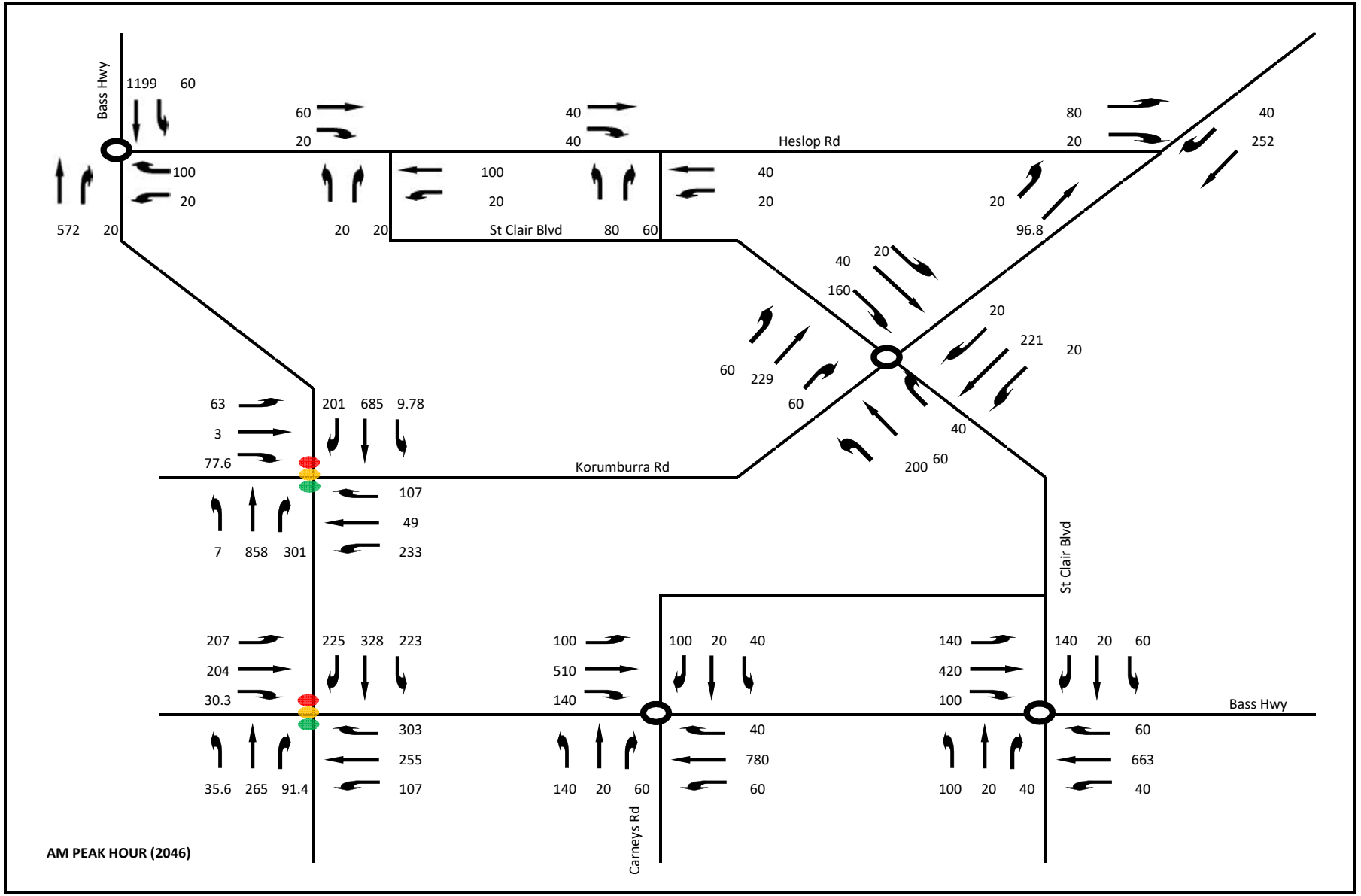
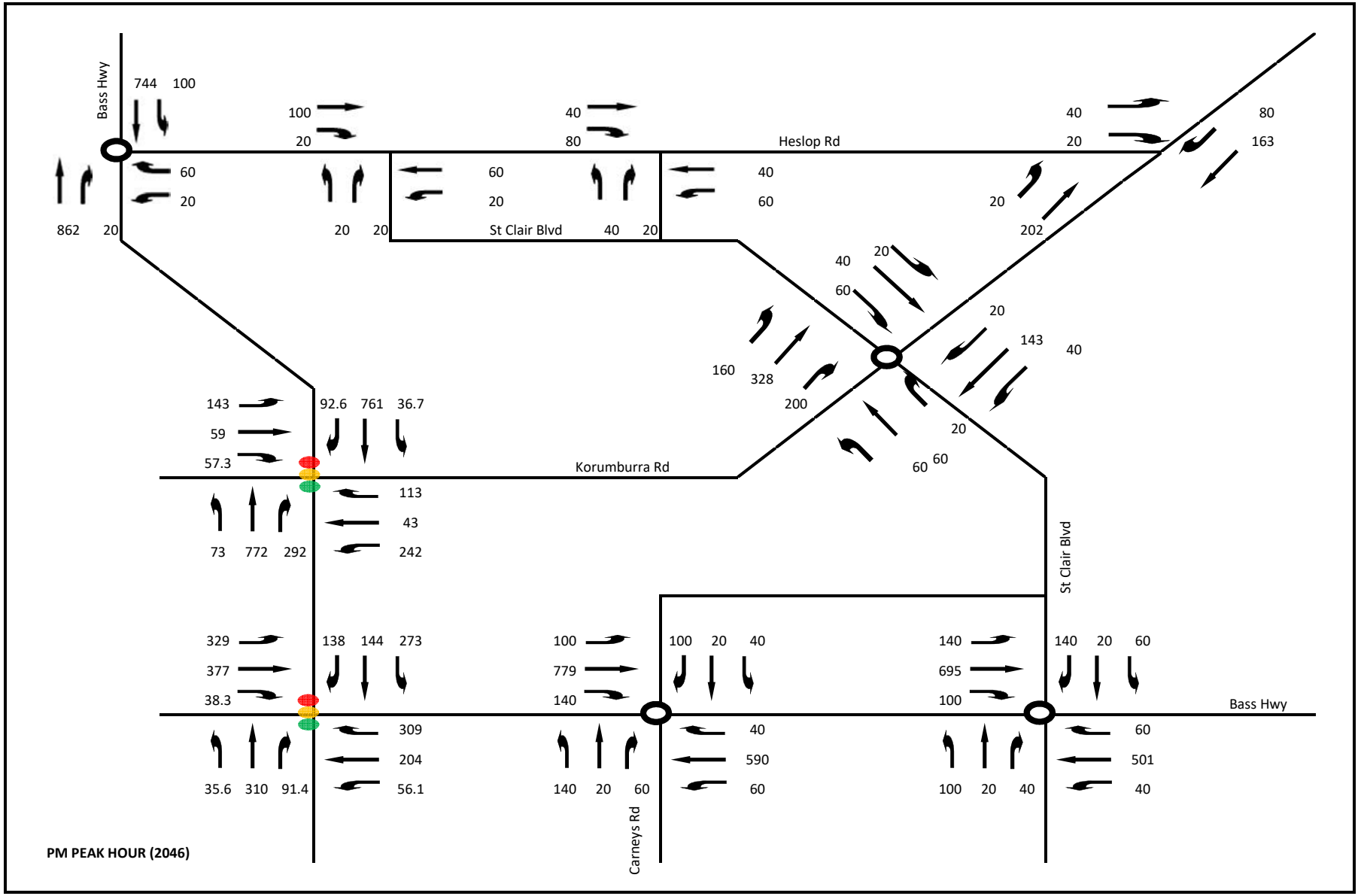
Appendix C

Peak Hour Traffic Volume Estimates


Bass Hwy
1199
60
572
20
100
20
60
20
20
20
40
40
100
20
20
20
Heslop Rd
St Clair Blvd
80
60
40
20
80
20
20
96.8
40
252
40
160
20
60
229
60
20
221
20
40
200
60
Korumburra Rd
63
3
77.6
201
685
9.78
107
49
233
7
858
301
St Clair Blvd
207
204
30.3
225
328
223
303
255
107
35.6
265
91.4
100
510
140
100
20
40
40
780
60
140
20
60
Carneys Rd
140
420
100
140
20
60
60
663
40
100
20
40
Bass Hwy
AM PEAK HOUR (2046)


Bass Hwy
744 100
862 20
60
20
100
20
20 20
40
80
60
20
St Clair Blvd 40 20
40
60
Heslop Rd
40
20
80
163
20
202
40
60
20
160
328
200
20
143
40
20
60 60
143
59
57.3
92.6 761 36.7
Korumburra Rd
113
43
242
73 772 292
St Clair Blvd
329
377
38.3
138 144 273
309
204
56.1
35.6 310 91.4
100
779
140
100 20 40
40
590
60
140 20 60
Carneys Rd
140
695
100
140 20 60
Bass Hwy
60
501
40
100 20 40
PM PEAK HOUR (2046)

Appendix D

SIDRA INTERSECTION Results

MOVEMENT SUMMARY

Site: 101 [AM Bass Highway / Carneys Road]

New Site
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Carneys Road - S Leg											
1	L2	147	5.0	0.562	19.1	LOS B	5.3	38.6	1.00	1.11	44.5
2	T1	21	5.0	0.562	19.3	LOS B	5.3	38.6	1.00	1.11	45.4
3	R2	63	5.0	0.562	24.0	LOS C	5.3	38.6	1.00	1.11	45.3
Approach		232	5.0	0.562	20.4	LOS C	5.3	38.6	1.00	1.11	44.8
East: Bass Highway - E Leg											
4	L2	63	5.0	0.845	11.8	LOS B	15.7	118.5	0.97	0.94	49.3
5	T1	821	10.0	0.845	12.2	LOS B	15.7	118.5	0.97	0.94	50.4
6	R2	42	5.0	0.845	16.7	LOS B	15.7	118.5	0.97	0.94	50.4
Approach		926	9.4	0.845	12.4	LOS B	15.7	118.5	0.97	0.94	50.3
North: Carneys Road - N Leg											
7	L2	42	5.0	0.256	9.3	LOS A	1.7	12.4	0.81	0.85	49.4
8	T1	21	5.0	0.256	9.5	LOS A	1.7	12.4	0.81	0.85	50.5
9	R2	105	5.0	0.256	14.1	LOS B	1.7	12.4	0.81	0.85	50.4
Approach		168	5.0	0.256	12.3	LOS B	1.7	12.4	0.81	0.85	50.2
West: Bass Highway - W Leg											
10	L2	105	5.0	0.616	5.0	LOS A	6.3	47.4	0.56	0.54	52.5
11	T1	537	10.0	0.616	5.4	LOS A	6.3	47.4	0.56	0.54	53.6
12	R2	147	5.0	0.616	9.9	LOS A	6.3	47.4	0.56	0.54	53.6
Approach		789	8.4	0.616	6.2	LOS A	6.3	47.4	0.56	0.54	53.5
All Vehicles		2116	8.2	0.845	10.9	LOS B	15.7	118.5	0.81	0.80	50.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [AM Bass Highway / Heslop Road (North)]

New Site
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Bass Highway - S Leg											
2	T1	602	10.0	0.424	2.8	LOS A	3.8	28.6	0.42	0.30	58.3
3	R2	21	5.0	0.424	10.2	LOS B	3.8	28.6	0.42	0.30	59.6
Approach		623	9.8	0.424	3.1	LOS A	3.8	28.6	0.42	0.30	58.4
East: Heslop Road - E Leg											
4	L2	21	10.0	0.272	18.5	LOS B	2.3	16.7	1.00	0.92	44.4
6	R2	105	5.0	0.272	25.1	LOS C	2.3	16.7	1.00	0.92	46.6
Approach		126	5.8	0.272	24.0	LOS C	2.3	16.7	1.00	0.92	46.2
North: Bass Highway - N Leg											
7	L2	63	5.0	0.773	2.9	LOS A	13.7	103.7	0.28	0.25	56.9
8	T1	1262	10.0	0.773	2.5	LOS A	13.7	103.7	0.28	0.25	59.4
Approach		1325	9.8	0.773	2.5	LOS A	13.7	103.7	0.28	0.25	59.3
All Vehicles		2075	9.5	0.773	4.0	LOS A	13.7	103.7	0.37	0.30	58.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [AM Peak - Future]

Bass Highway & Korumburra Road
Signals - Fixed Time Isolated Cycle Time = 100 seconds (Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Bass Highway											
1	L2	7	5.0	0.409	24.8	LOS C	10.9	82.6	0.71	0.62	44.5
2	T1	903	10.0	0.889	31.5	LOS C	28.7	218.3	0.81	0.83	39.5
3	R2	317	5.0	0.883	59.3	LOS E	17.8	130.0	1.00	0.99	30.1
Approach		1227	8.7	0.889	38.6	LOS D	28.7	218.3	0.86	0.87	36.6
East: Korumburra Road											
4	L2	245	5.0	0.351	28.8	LOS C	8.4	61.6	0.75	0.78	39.9
5	T1	52	5.0	0.210	43.1	LOS D	2.3	16.9	0.93	0.70	35.2
6	R2	113	5.0	0.897	67.9	LOS E	6.5	47.3	1.00	1.01	28.0
Approach		409	5.0	0.897	41.3	LOS D	8.4	61.6	0.84	0.83	35.2
North: Bass Highway											
7	L2	10	5.0	0.394	30.6	LOS C	9.4	71.0	0.78	0.67	41.5
8	T1	721	10.0	0.857	34.3	LOS C	23.3	177.3	0.88	0.86	38.4
9	R2	169	5.0	0.859	62.1	LOS E	9.3	68.2	1.00	0.97	29.4
Approach		901	9.0	0.859	39.5	LOS D	23.3	177.3	0.90	0.87	36.3
West: Korumburra Road											
10	L2	66	5.0	0.123	32.9	LOS C	2.3	17.1	0.76	0.73	38.2
11	T1	3	5.0	0.013	41.0	LOS D	0.1	1.0	0.89	0.57	35.9
12	R2	82	5.0	0.651	58.8	LOS E	4.2	30.8	1.00	0.81	30.1
Approach		151	5.0	0.651	47.1	LOS D	4.2	30.8	0.89	0.77	33.3
All Vehicles		2689	8.0	0.897	39.8	LOS D	28.7	218.3	0.87	0.86	36.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	44.3	LOS E	0.1	0.1	0.94	0.94
P2	East Full Crossing	53	27.4	LOS C	0.1	0.1	0.74	0.74
P3	North Full Crossing	53	44.3	LOS E	0.1	0.1	0.94	0.94
P4	West Full Crossing	53	21.2	LOS C	0.1	0.1	0.65	0.65
All Pedestrians		211	34.3	LOS D			0.82	0.82

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [AM Peak - Future]

Bass Highway & McKenzie Street & Graham Street
Signals - Fixed Time Isolated Cycle Time = 100 seconds (Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: McKenzie Street											
1	L2	38	5.0	0.901	62.0	LOS E	18.2	133.0	1.00	1.07	30.5
2	T1	279	5.0	0.901	56.4	LOS E	18.2	133.0	1.00	1.07	31.0
3	R2	96	5.0	0.281	43.6	LOS D	4.1	29.8	0.90	0.77	34.4
Approach		413	5.0	0.901	53.9	LOS D	18.2	133.0	0.98	1.00	31.7
East: Bass Highway											
4	L2	113	5.0	0.299	42.0	LOS D	4.7	34.4	0.89	0.77	34.9
5	T1	268	10.0	0.698	41.1	LOS D	12.6	95.8	0.98	0.85	35.9
6	R2	319	10.0	0.876	58.1	LOS E	17.8	135.1	1.00	0.98	30.2
Approach		700	9.2	0.876	49.0	LOS D	17.8	135.1	0.97	0.90	32.9
North: Bass Highway											
7	L2	235	10.0	0.195	9.0	LOS A	2.9	22.2	0.35	0.65	51.4
8	T1	345	5.0	0.871	50.9	LOS D	18.9	137.9	1.00	1.03	32.7
9	R2	237	10.0	0.651	45.7	LOS D	10.9	82.7	0.97	0.83	33.6
Approach		817	7.9	0.871	37.4	LOS D	18.9	137.9	0.80	0.86	36.9
West: Graham Street											
10	L2	225	10.0	0.866	60.5	LOS E	12.5	94.8	1.00	0.97	29.6
11	T1	222	10.0	0.809	50.2	LOS D	11.6	88.1	1.00	0.95	32.9
12	R2	33	5.0	0.121	46.0	LOS D	1.4	10.3	0.90	0.72	33.5
Approach		480	9.7	0.866	54.8	LOS D	12.5	94.8	0.99	0.94	31.3
All Vehicles		2409	8.1	0.901	47.0	LOS D	18.9	137.9	0.92	0.91	33.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	37.1	LOS D	0.1	0.1	0.86	0.86
P2	East Full Crossing	53	39.7	LOS D	0.1	0.1	0.89	0.89
P3	North Full Crossing	53	42.4	LOS E	0.1	0.1	0.92	0.92
P4	West Full Crossing	53	41.5	LOS E	0.1	0.1	0.91	0.91
All Pedestrians		211	40.2	LOS E			0.90	0.90

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [AM Bass Highway / St Clair Boulevard]

New Site
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Commercial Connector Road - S Leg											
1	L2	105	5.0	0.340	11.6	LOS B	2.5	18.2	0.94	0.94	49.0
2	T1	21	5.0	0.340	11.9	LOS B	2.5	18.2	0.94	0.94	50.1
3	R2	42	5.0	0.340	16.5	LOS B	2.5	18.2	0.94	0.94	50.0
Approach		168	5.0	0.340	12.9	LOS B	2.5	18.2	0.94	0.94	49.3
East: Bass Highway - E Leg											
4	L2	42	5.0	0.742	8.7	LOS A	9.7	73.6	0.84	0.80	51.3
5	T1	698	10.0	0.742	9.1	LOS A	9.7	73.6	0.84	0.80	52.4
6	R2	63	5.0	0.742	13.5	LOS B	9.7	73.6	0.84	0.80	52.4
Approach		803	9.3	0.742	9.4	LOS A	9.7	73.6	0.84	0.80	52.4
North: St Clair Boulevard - N Leg											
7	L2	63	5.0	0.292	7.9	LOS A	1.9	13.7	0.74	0.81	50.3
8	T1	21	5.0	0.292	8.1	LOS A	1.9	13.7	0.74	0.81	51.5
9	R2	147	5.0	0.292	12.7	LOS B	1.9	13.7	0.74	0.81	51.3
Approach		232	5.0	0.292	11.0	LOS B	1.9	13.7	0.74	0.81	51.1
West: Bass Highway - W Leg											
10	L2	147	5.0	0.541	4.9	LOS A	4.8	35.6	0.49	0.53	52.9
11	T1	442	10.0	0.541	5.2	LOS A	4.8	35.6	0.49	0.53	54.1
12	R2	105	5.0	0.541	9.8	LOS A	4.8	35.6	0.49	0.53	54.1
Approach		695	8.2	0.541	5.8	LOS A	4.8	35.6	0.49	0.53	53.8
All Vehicles		1898	8.0	0.742	8.6	LOS A	9.7	73.6	0.71	0.71	52.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [AM Heslop Road / Fuller Road]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Fuller Road - S Leg											
1	L2	21	5.0	0.043	6.0	LOS A	0.2	1.2	0.26	0.57	52.6
3	R2	21	5.0	0.043	7.0	LOS A	0.2	1.2	0.26	0.57	52.4
Approach		42	5.0	0.043	6.5	LOS A	0.2	1.2	0.26	0.57	52.5
East: Heslop Road - E Leg											
4	L2	21	5.0	0.012	5.6	LOS A	0.0	0.0	0.00	0.58	53.4
5	T1	105	5.0	0.056	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		126	5.0	0.056	0.9	NA	0.0	0.0	0.00	0.10	58.8
West: Heslop Road - W Leg											
11	T1	63	5.0	0.033	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R2	21	5.0	0.017	6.0	LOS A	0.1	0.5	0.23	0.56	52.3
Approach		84	5.0	0.033	1.5	NA	0.1	0.5	0.06	0.14	57.9
All Vehicles		253	5.0	0.056	2.1	NA	0.2	1.2	0.06	0.19	57.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [AM Heslop Road / St Clair Boulevard]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: St Clair Boulevard - S Leg											
1	L2	84	5.0	0.138	5.8	LOS A	0.6	4.1	0.15	0.56	52.9
3	R2	63	5.0	0.138	6.6	LOS A	0.6	4.1	0.15	0.56	52.7
Approach		147	5.0	0.138	6.1	LOS A	0.6	4.1	0.15	0.56	52.8
East: Heslop Road - E Leg											
4	L2	21	5.0	0.012	5.6	LOS A	0.0	0.0	0.00	0.58	53.4
5	T1	42	5.0	0.022	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		63	5.0	0.022	1.9	NA	0.0	0.0	0.00	0.19	57.6
West: Heslop Road - W Leg											
11	T1	42	5.0	0.022	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R2	42	5.0	0.032	5.7	LOS A	0.1	0.9	0.16	0.56	52.5
Approach		84	5.0	0.032	2.9	NA	0.1	0.9	0.08	0.28	56.0
All Vehicles		295	5.0	0.138	4.3	NA	0.6	4.1	0.10	0.40	54.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [AM Korumburra Road / Heslop Road]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Korumburra Road											
1	L2	21	5.0	0.012	5.6	LOS A	0.0	0.0	0.00	0.58	53.4
2	T1	102	5.0	0.054	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		123	5.0	0.054	1.0	NA	0.0	0.0	0.00	0.10	58.7
North: Korumburra Road											
8	T1	265	5.0	0.140	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R2	42	5.0	0.034	6.0	LOS A	0.1	1.0	0.23	0.57	52.3
Approach		307	5.0	0.140	0.8	NA	0.1	1.0	0.03	0.08	58.8
West: Heslop Road											
10	L2	84	5.0	0.107	6.0	LOS A	0.4	2.9	0.23	0.57	52.6
12	R2	21	5.0	0.107	9.5	LOS A	0.4	2.9	0.23	0.57	52.3
Approach		105	5.0	0.107	6.7	LOS A	0.4	2.9	0.23	0.57	52.5
All Vehicles		536	5.0	0.140	2.0	NA	0.4	2.9	0.06	0.18	57.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [AM Korumburra Road / St Clair Boulevard]

New Site
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: St Clair Boulevard - S Leg											
1	L2	211	5.0	0.333	6.7	LOS A	2.1	15.3	0.63	0.70	52.6
2	T1	63	5.0	0.333	6.9	LOS A	2.1	15.3	0.63	0.70	53.9
3	R2	42	5.0	0.333	11.5	LOS B	2.1	15.3	0.63	0.70	53.8
Approach		316	5.0	0.333	7.4	LOS A	2.1	15.3	0.63	0.70	53.1
East: Korumburra Road - E Leg											
4	L2	21	5.0	0.259	5.5	LOS A	1.6	11.4	0.51	0.58	52.9
5	T1	233	5.0	0.259	5.8	LOS A	1.6	11.4	0.51	0.58	54.2
6	R2	21	5.0	0.259	10.4	LOS B	1.6	11.4	0.51	0.58	54.0
Approach		275	5.0	0.259	6.1	LOS A	1.6	11.4	0.51	0.58	54.1
North: St Clair Boulevard - N Leg											
7	L2	21	5.0	0.230	5.9	LOS A	1.3	9.8	0.54	0.69	51.2
8	T1	42	5.0	0.230	6.2	LOS A	1.3	9.8	0.54	0.69	52.4
9	R2	168	5.0	0.230	10.8	LOS B	1.3	9.8	0.54	0.69	52.3
Approach		232	5.0	0.230	9.5	LOS A	1.3	9.8	0.54	0.69	52.2
West: Korumburra Road - W Leg											
10	L2	63	5.0	0.292	4.6	LOS A	1.9	14.0	0.37	0.51	53.3
11	T1	241	5.0	0.292	4.9	LOS A	1.9	14.0	0.37	0.51	54.6
12	R2	63	5.0	0.292	9.5	LOS A	1.9	14.0	0.37	0.51	54.5
Approach		367	5.0	0.292	5.6	LOS A	1.9	14.0	0.37	0.51	54.3
All Vehicles		1189	5.0	0.333	7.0	LOS A	2.1	15.3	0.51	0.61	53.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [PM Bass Highway / Carneys Road]

New Site
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Carneys Road - S Leg											
1	L2	147	5.0	0.379	9.9	LOS A	2.7	20.0	0.89	0.91	50.0
2	T1	21	5.0	0.379	10.1	LOS B	2.7	20.0	0.89	0.91	51.2
3	R2	63	5.0	0.379	14.8	LOS B	2.7	20.0	0.89	0.91	51.1
Approach		232	5.0	0.379	11.2	LOS B	2.7	20.0	0.89	0.91	50.4
East: Bass Highway - E Leg											
4	L2	63	5.0	0.675	7.5	LOS A	7.4	55.6	0.77	0.74	51.8
5	T1	621	10.0	0.675	7.9	LOS A	7.4	55.6	0.77	0.74	52.9
6	R2	42	5.0	0.675	12.4	LOS B	7.4	55.6	0.77	0.74	52.9
Approach		726	9.3	0.675	8.1	LOS A	7.4	55.6	0.77	0.74	52.8
North: Carneys Road - N Leg											
7	L2	42	5.0	0.428	16.3	LOS B	3.5	25.5	1.00	1.04	45.2
8	T1	21	5.0	0.428	16.5	LOS B	3.5	25.5	1.00	1.04	46.2
9	R2	105	5.0	0.428	21.2	LOS C	3.5	25.5	1.00	1.04	46.1
Approach		168	5.0	0.428	19.4	LOS B	3.5	25.5	1.00	1.04	45.9
West: Bass Highway - W Leg											
10	L2	105	5.0	0.822	5.7	LOS A	12.6	95.2	0.82	0.58	51.5
11	T1	820	10.0	0.822	6.1	LOS A	12.6	95.2	0.82	0.58	52.7
12	R2	147	5.0	0.822	10.6	LOS B	12.6	95.2	0.82	0.58	52.7
Approach		1073	8.8	0.822	6.6	LOS A	12.6	95.2	0.82	0.58	52.6
All Vehicles		2199	8.3	0.822	8.6	LOS A	12.6	95.2	0.83	0.70	51.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [PM Bass Highway / Heslop Road (North)]

New Site
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Bass Highway - S Leg											
2	T1	907	10.0	0.586	2.7	LOS A	6.4	48.5	0.38	0.28	58.6
3	R2	21	5.0	0.586	10.0	LOS B	6.4	48.5	0.38	0.28	59.9
Approach		928	9.9	0.586	2.9	LOS A	6.4	48.5	0.38	0.28	58.7
East: Heslop Road - E Leg											
4	L2	21	5.0	0.093	6.9	LOS A	0.6	4.3	0.72	0.72	51.2
6	R2	63	5.0	0.093	13.9	LOS B	0.6	4.3	0.72	0.72	54.2
Approach		84	5.0	0.093	12.1	LOS B	0.6	4.3	0.72	0.72	53.4
North: Bass Highway - N Leg											
7	L2	105	5.0	0.521	2.8	LOS A	4.8	36.3	0.17	0.24	57.6
8	T1	783	10.0	0.521	2.4	LOS A	4.8	36.3	0.17	0.24	60.2
Approach		888	9.4	0.521	2.4	LOS A	4.8	36.3	0.17	0.24	59.9
All Vehicles		1901	9.4	0.586	3.1	LOS A	6.4	48.5	0.29	0.28	59.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [PM Peak - Future]

Bass Highway & Korumburra Road
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Bass Highway											
1	L2	77	5.0	0.322	20.7	LOS C	10.1	76.0	0.58	0.56	46.1
2	T1	813	10.0	0.701	17.6	LOS B	21.2	160.9	0.66	0.61	46.3
3	R2	307	5.0	0.894	70.1	LOS E	20.6	150.5	1.00	0.98	27.6
Approach		1197	8.4	0.894	31.3	LOS C	21.2	160.9	0.74	0.70	39.4
East: Korumburra Road											
4	L2	255	5.0	0.387	35.6	LOS D	10.9	79.9	0.79	0.79	37.1
5	T1	45	5.0	0.192	51.7	LOS D	2.4	17.7	0.93	0.70	32.5
6	R2	119	5.0	0.884	76.8	LOS E	8.0	58.1	1.00	0.97	26.2
Approach		419	5.0	0.884	49.1	LOS D	10.9	79.9	0.86	0.83	32.7
North: Bass Highway											
7	L2	39	5.0	0.425	32.1	LOS C	13.1	99.1	0.76	0.67	40.6
8	T1	801	10.0	0.924	45.3	LOS D	33.7	256.2	0.84	0.90	34.4
9	R2	55	5.0	0.618	71.1	LOS E	3.5	25.2	1.00	0.78	27.4
Approach		895	9.5	0.924	46.3	LOS D	33.7	256.2	0.85	0.88	34.0
West: Korumburra Road											
10	L2	151	5.0	0.373	48.3	LOS D	7.5	54.9	0.89	0.79	32.9
11	T1	62	5.0	0.263	52.3	LOS D	3.4	24.6	0.94	0.72	32.3
12	R2	60	5.0	0.448	65.9	LOS E	3.6	26.0	1.00	0.76	28.4
Approach		273	5.0	0.448	53.1	LOS D	7.5	54.9	0.93	0.77	31.7
All Vehicles		2784	7.9	0.924	40.9	LOS D	33.7	256.2	0.81	0.79	35.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	54.3	LOS E	0.2	0.2	0.95	0.95
P2	East Full Crossing	53	27.4	LOS C	0.1	0.1	0.68	0.68
P3	North Full Crossing	53	54.3	LOS E	0.2	0.2	0.95	0.95
P4	West Full Crossing	53	17.1	LOS B	0.1	0.1	0.53	0.53
All Pedestrians		211	38.3	LOS D			0.78	0.78

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [PM Peak - Future]

Bass Highway & McKenzie Street & Graham Street
Signals - Fixed Time Isolated Cycle Time = 150 seconds (Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: McKenzie Street											
1	L2	38	5.0	0.960	97.3	LOS F	32.9	240.2	1.00	1.16	23.6
2	T1	326	5.0	0.960	91.7	LOS F	32.9	240.2	1.00	1.16	23.9
3	R2	96	5.0	0.616	79.7	LOS E	7.0	51.4	1.00	0.79	25.7
Approach		460	5.0	0.960	89.7	LOS F	32.9	240.2	1.00	1.08	24.2
East: Bass Highway											
4	L2	59	5.0	0.058	20.8	LOS C	1.9	13.7	0.47	0.68	43.7
5	T1	215	10.0	0.267	28.1	LOS C	9.8	74.3	0.68	0.57	41.1
6	R2	325	10.0	0.956	99.3	LOS F	29.7	225.4	1.00	1.02	22.5
Approach		599	9.5	0.956	66.1	LOS E	29.7	225.4	0.83	0.83	28.5
North: Bass Highway											
7	L2	287	10.0	0.266	13.9	LOS B	7.7	58.3	0.43	0.68	48.1
8	T1	152	5.0	0.354	52.4	LOS D	9.3	67.9	0.89	0.73	32.3
9	R2	145	10.0	0.967	109.4	LOS F	13.3	101.0	1.00	1.04	21.2
Approach		584	8.7	0.967	47.6	LOS D	13.3	101.0	0.69	0.78	33.4
West: Graham Street											
10	L2	346	10.0	0.592	35.3	LOS D	17.0	129.5	0.73	0.79	37.2
11	T1	397	10.0	0.987	98.8	LOS F	36.8	279.8	0.92	1.17	22.9
12	R2	40	5.0	0.257	76.4	LOS E	2.8	20.5	0.97	0.74	26.2
Approach		783	9.7	0.987	69.6	LOS E	36.8	279.8	0.84	0.98	27.8
All Vehicles		2426	8.5	0.987	67.2	LOS E	36.8	279.8	0.83	0.92	28.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	27.7	LOS C	0.1	0.1	0.61	0.61
P2	East Full Crossing	53	53.0	LOS E	0.2	0.2	0.84	0.84
P3	North Full Crossing	53	39.0	LOS D	0.2	0.2	0.72	0.72
P4	West Full Crossing	53	53.0	LOS E	0.2	0.2	0.84	0.84
All Pedestrians		211	43.2	LOS E			0.75	0.75

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [PM Bass Highway / St Clair Boulevard]

New Site
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Commercial Connector Road - S Leg											
1	L2	105	5.0	0.257	9.2	LOS A	1.7	12.6	0.82	0.84	50.6
2	T1	21	5.0	0.257	9.4	LOS A	1.7	12.6	0.82	0.84	51.8
3	R2	42	5.0	0.257	14.0	LOS B	1.7	12.6	0.82	0.84	51.7
Approach		168	5.0	0.257	10.4	LOS B	1.7	12.6	0.82	0.84	51.0
East: Bass Highway - E Leg											
4	L2	42	5.0	0.597	6.5	LOS A	5.4	41.0	0.72	0.69	51.9
5	T1	527	10.0	0.597	6.9	LOS A	5.4	41.0	0.72	0.69	53.1
6	R2	63	5.0	0.597	11.4	LOS B	5.4	41.0	0.72	0.69	53.1
Approach		633	9.2	0.597	7.3	LOS A	5.4	41.0	0.72	0.69	53.0
North: Internal Spine Connector Road - N Leg											
7	L2	63	5.0	0.438	12.9	LOS B	3.5	25.5	0.95	1.01	47.1
8	T1	21	5.0	0.438	13.1	LOS B	3.5	25.5	0.95	1.01	48.1
9	R2	147	5.0	0.438	17.8	LOS B	3.5	25.5	0.95	1.01	48.1
Approach		232	5.0	0.438	16.0	LOS B	3.5	25.5	0.95	1.01	47.8
West: Bass Highway - W Leg											
10	L2	147	5.0	0.752	5.4	LOS A	9.5	71.2	0.68	0.55	52.2
11	T1	732	10.0	0.752	5.8	LOS A	9.5	71.2	0.68	0.55	53.4
12	R2	105	5.0	0.752	10.3	LOS B	9.5	71.2	0.68	0.55	53.3
Approach		984	8.7	0.752	6.2	LOS A	9.5	71.2	0.68	0.55	53.2
All Vehicles		2017	8.1	0.752	8.0	LOS A	9.5	71.2	0.73	0.67	52.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [PM Heslop Road / Fuller Road]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Fuller Road - S Leg											
1	L2	21	5.0	0.043	5.8	LOS A	0.2	1.2	0.20	0.56	52.8
3	R2	21	5.0	0.043	7.0	LOS A	0.2	1.2	0.20	0.56	52.5
Approach		42	5.0	0.043	6.4	LOS A	0.2	1.2	0.20	0.56	52.7
East: Heslop Road - E Leg											
4	L2	21	5.0	0.012	5.6	LOS A	0.0	0.0	0.00	0.58	53.4
5	T1	63	5.0	0.033	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		84	5.0	0.033	1.4	NA	0.0	0.0	0.00	0.14	58.2
West: Heslop Road - W Leg											
11	T1	105	5.0	0.056	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R2	21	5.0	0.016	5.8	LOS A	0.1	0.5	0.18	0.56	52.4
Approach		126	5.0	0.056	1.0	NA	0.1	0.5	0.03	0.09	58.6
All Vehicles		253	5.0	0.056	2.0	NA	0.2	1.2	0.05	0.19	57.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [PM Heslop Road / St Clair Boulevard]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: St Clair Boulevard - S Leg											
1	L2	42	5.0	0.059	5.8	LOS A	0.2	1.6	0.13	0.56	53.0
3	R2	21	5.0	0.059	7.0	LOS A	0.2	1.6	0.13	0.56	52.7
Approach		63	5.0	0.059	6.2	LOS A	0.2	1.6	0.13	0.56	52.9
East: Heslop Road - E Leg											
4	L2	63	5.0	0.035	5.6	LOS A	0.0	0.0	0.00	0.58	53.4
5	T1	42	5.0	0.022	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		105	5.0	0.035	3.4	NA	0.0	0.0	0.00	0.35	55.9
West: Heslop Road - W Leg											
11	T1	42	5.0	0.022	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R2	84	5.0	0.066	5.9	LOS A	0.3	2.0	0.22	0.57	52.3
Approach		126	5.0	0.066	4.0	NA	0.3	2.0	0.14	0.38	54.6
All Vehicles		295	5.0	0.066	4.2	NA	0.3	2.0	0.09	0.41	54.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [PM Korumburra Road / Heslop Road]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Korumburra Road											
1	L2	21	5.0	0.012	5.6	LOS A	0.0	0.0	0.00	0.58	53.4
2	T1	213	5.0	0.113	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		234	5.0	0.113	0.5	NA	0.0	0.0	0.00	0.05	59.3
North: Korumburra Road											
8	T1	172	5.0	0.091	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R2	84	5.0	0.076	6.6	LOS A	0.3	2.2	0.34	0.61	52.0
Approach		256	5.0	0.091	2.2	NA	0.3	2.2	0.11	0.20	57.1
West: Heslop Road											
10	L2	42	5.0	0.078	6.5	LOS A	0.3	2.1	0.38	0.63	51.8
12	R2	21	5.0	0.078	9.9	LOS A	0.3	2.1	0.38	0.63	51.6
Approach		63	5.0	0.078	7.7	LOS A	0.3	2.1	0.38	0.63	51.8
All Vehicles		553	5.0	0.113	2.1	NA	0.3	2.2	0.10	0.19	57.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [PM Korumburra Road / St Clair Boulevard]

New Site
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: St Clair Boulevard - S Leg											
1	L2	63	5.0	0.137	5.3	LOS A	0.7	5.4	0.45	0.56	53.2
2	T1	63	5.0	0.137	5.5	LOS A	0.7	5.4	0.45	0.56	54.5
3	R2	21	5.0	0.137	10.1	LOS B	0.7	5.4	0.45	0.56	54.4
Approach		147	5.0	0.137	6.0	LOS A	0.7	5.4	0.45	0.56	53.9
East: Korumburra Road - E Leg											
4	L2	21	5.0	0.207	5.7	LOS A	1.2	8.6	0.51	0.61	52.6
5	T1	151	5.0	0.207	5.9	LOS A	1.2	8.6	0.51	0.61	53.9
6	R2	42	5.0	0.207	10.6	LOS B	1.2	8.6	0.51	0.61	53.7
Approach		214	5.0	0.207	6.8	LOS A	1.2	8.6	0.51	0.61	53.7
North: St Clair Boulevard - N Leg											
7	L2	21	5.0	0.156	7.3	LOS A	0.9	6.8	0.67	0.74	51.0
8	T1	42	5.0	0.156	7.5	LOS A	0.9	6.8	0.67	0.74	52.2
9	R2	63	5.0	0.156	12.2	LOS B	0.9	6.8	0.67	0.74	52.1
Approach		126	5.0	0.156	9.8	LOS A	0.9	6.8	0.67	0.74	51.9
West: Korumburra Road - W Leg											
10	L2	168	5.0	0.550	4.9	LOS A	4.7	34.4	0.47	0.55	52.7
11	T1	345	5.0	0.550	5.2	LOS A	4.7	34.4	0.47	0.55	53.9
12	R2	211	5.0	0.550	9.8	LOS A	4.7	34.4	0.47	0.55	53.8
Approach		724	5.0	0.550	6.5	LOS A	4.7	34.4	0.47	0.55	53.6
All Vehicles		1212	5.0	0.550	6.8	LOS A	4.7	34.4	0.50	0.58	53.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Appendix E

Concept Layouts and Opinion of Probable Costs

PSP Intersections

NOTES

DESIGN SPEED: 80KM/H
POSTED SPEED: 80KM/H
DESIGN VEHICLE: 12.5m SU TRUCK

HESLOP

LIMIT OF WORKS

3.5 3.5 (E/TE)

80.0 DIVERGE LENGTH

25.0 TAPER

75.0 STORAGE

12.5

10.0

15.0

3.5 3.5 3.5

DIVERGE LENGTH 80.0

3.3 6.0

3.5 3.5 3.5

70.0 STORAGE

25.0 TAPER

6.0 (E)

LIMIT OF WORKS

FULLER ROAD

ROAD

3.5 3.5 (E/TE)

LIMIT OF WORKS

N

MAP REF XXX/XXX

IN-01

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Perth	08 6169 1000

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

WARNING
BEWARE OF UNDERGROUND SERVICES
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DESIGNED	A. WHALE
DESIGN CHECK	H. GIRGIN
APPROVED BY	H. GIRGIN
DATE ISSUED	19 APRIL 2017

SCALE A3 — 0 5 10 — 1:1000

CAD FILE NO. V106370-SK01-P1.dgn

WONTHAGGI NORTH EAST PSP
HESLOP ROAD / FULLER ROAD
INTERSECTION 1
CONCEPT LAYOUT

DRAWING NO. V106370-SK01 ISSUE P1

PLOTTED BY : hakan.girgin ON 1/08/2017 AT 4:04:22 PM

GTAconsultants

V106370: Wonthaggi North East PSP - Heslop Rd / Fuller Rd					
Civil Construction					
Date	**7/02/2020**				
Basis of Estimate					
This cost estimate is based on GTA plan V106370-SK01 P1 dated 19 Apr 2017 (Taper end along Heslop Road and 50m along Fuller Road)					
	Heslop Rd / Fuller Rd - Proposed T intersection				
Item	**Description of works**	**Quantity**	**Unit**	**Rate**	**Amount**
1.00	**GENERAL**				
1.01	Site establishment	1	Item	$ 8,000.00	$ 8,000.00
1.02	Insurance	1	Item	$ 2,000.00	$ 2,000.00
1.03	Traffic Management and Control	40	Day	$ 700.00	$ 28,000.00
1.04	Supervision	1	Item	$ 8,000.00	$ 8,000.00
1.05	Surveying	1	Item	$ 6,000.00	$ 6,000.00
1.06	Sedimentation Control	1	Item	$ 1,500.00	$ 1,500.00
1.07	As Built Drawing preparation as per council and Vic Roads requirement	1	Item	$ 1,000.00	$ 1,000.00
2.00	**DEMOLITION, SITE PREPARATION AND RELOCATION ITEMS (Including removal from site)**				
2.01	Proving existing services	1	Item	$ 3,500.00	$ 3,500.00
2.02	Tree Removals	6	No	$ 160.00	$ 960.00
3.00	**BULK EARTHWORKS**				
3.01	Stripping and stockpiling of selected topsoil for reuse, excavation to proposed formation levels, including trimming, rolling, cutting and shaping, compaction of subgrades, removal and disposal of trees, shrubs, spoil, surplus unapproved soil, etc. This item is to incorporate the supply and placement of fill material as specified and directed including compaction to 98% modified compaction, as per AS1289, where specified.	1	Item	$ 25,000.00	$ 25,000.00
4.00	**KERB AND CHANNEL / CONCRETE WORKS**				
	Construction of the following items including provision of all necessary plant and materials, trimming, bedding, forming, mixing, paving, jointing, making and finishing.				
4.01	**Kerb and Channel, Concrete Strength**				
	25MPa Standard				
4.01.1	Semi Mountable kerb and channel - SM2 or Council equivalent	300	Lm	$ 70.00	$ 21,000.00
5.00	**PAVEMENTS, RIGID**				
	Construction of the following items including provision of all necessary plant and materials, trimming, bedding, forming, mixing, paving, jointing, making and finishing.				
5.01	**Concrete Footpath Pavement, including bedding as specified Concrete Strength**				
	25MPa Standard				
5.01.1	125mm depth pavement, colour and finish as specified	540	m^2	$ 125.00	$ 67,500.00
5.01.2	Reconstruction of pram ramp in accordance with council standards	4	Item	$ 1,250.00	$ 5,000.00
6.00	**PAVEMENTS, FLEXIBLE**				
	The supply and installation of the following compacted depth asphalt base and wearing courses including labour, materials, compaction and bituminous prime coat, to relevant specifications and as specified.				
6.01	**450mm Heavy duty pavement**				
6.01.1	Road pavements as specified and required	3950	m^2	$ 125.00	$ 493,750.00
7.00	**DRAINAGE**				
7.01	**Drainage Pipes and Culverts**				
7.01.1	300mm dia RCP Class 2, RRJ	40	Lm	$ 250.00	$ 10,000.00
7.02	**Drainage Pits**				
	Excavate for and construct concrete drainage structures including all materials, plant, labour, temporary covers, final pit lid and surround, step irons, forming, mixing, pouring, finishing and barricading all inclusive, unless otherwise defined.				
7.02.1	**Side Entry Pits, as specified**				
7.02.1.1	900 x 900	6	No	$ 1,850.00	$ 11,100.00
8.00	**AGRICULTURAL DRAINS**				
8.01	100mm dia grade 1000 AG drain, screening backfill	300	Lm	$ 55.00	$ 16,500.00
8.02	SSD Pit/ flush out riser/ outlet	6	Item	$ 1,250.00	$ 7,500.00

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9.00	**DELINEATION**				
9.01	**Signage**				
9.01.1	The supply and installation/relocation of directional and advisory traffic signage all inclusive and removal of all redundant signs as specified	1	Item	$ 2,500.00	$ 2,500.00
9.02	**Line marking**				
9.02.1	Installation of proposed line marking, including but not limited to lane division lines, directional arrows, bus lane surface treatment, stopping lines and RRPM's all inclusive				
9.02.2	Thermoplastic to VicRoads standards	1	Item	$ 3,000.00	$ 3,000.00
10.00	**LANDSCAPING/TOPSOILING & REINSTATEMENT**				
10.01	Topsoiling and seeding of nature strips, medians, batters, and all disturbed areas to a min. of 150mm min depth including regrading, cultivation throughout the duration of the works and the maintenance period	600	m^2	$ 50.00	$ 30,000.00
11.00	**MISCELLANEOUS**				
11.01	Public lights	3	No	$ 12,800.00	$ 38,400.00
11.02	Final clean-up, Including demobilisation and removal of temporary structures, etc.	1	Item	$ 4,000.00	$ 4,000.00
	Sub Total_Civil				*$ 794,210.00*
	Total				***$ 794,210.00***
	Total with 10% Project Management Fee				***$ 873,631.00***
	Total with 10% Project Management Fee + 30% contingency				***$ 1,135,720.30***

Please also note the following assumptions and exclusions

1. Design and documentation fees or authority fees, charges, levies and overview including insurances, bank guarantees.
2. Existing services relocations and facilitation including lowering or realignment thereof.
3. Protection of underground services during construction.
4. 30% contingency applied as order of magnitude estimate has been based on desktop study.
5. Asphalt resheet has been included for the approaches of the intersection only
6. Land acquisition
7. Price escalation is not included in the estimate
8. Excludes any allowance for abnormal weather conditions
9. No allowance has been made for night-works if required

The above opinion of probable costs should be considered current to the date of the document only. GTA Consultants cannot provide any form of assurance that the costings provided will not change due to changes in design and/or future costs of materials. The future outcome may vary, and this variation may be material.

This potential for variation should be considered in any circumstances where the costings are to be used for high level budgeting purposes, even in the short term.

Any party requiring detailed costing for quoting or construction purposes should seek a detailed cost estimate from a suitably qualified quantity surveyor.

NOTES

DESIGN SPEED: 80KM/H
POSTED SPEED: 80KM/H
DESIGN VEHICLE: 12.5m SU TRUCK
EXISTING ROAD RESERVE
PROPOSED ROAD RESERVE

LIMIT OF WORKS
3.5 3.5 (E) (E)
80.0 DIVERGE
25.0 TAPER
75.0 STORAGE
15.0
10.0
15.0
3.5
3.5 3.5
HESLOP ROAD
80.0 DIVERGE
5.0
5.0
LIMIT OF WORKS
75.0 STORAGE
25.0 TAPER
80.0 DIVERGE
LIMIT OF WORKS
3.5 3.5 (E) (E)
1.5 1.8 3.5 6.0 3.5 1.8 1.5
3.0 2.1 2.1 3.0
ST CLAIRE BOULEVARD
N

IN-02

ON 6/05/2019 AT 9:01:01 AM
PLOTTED BY : aaron.whale

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PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

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DESIGNED A. WHALE
DESIGN CHECK A. DELL'ISOLA
APPROVED BY A. FARRAN
DATE ISSUED 6 MAY 2019

SCALE A3 0 5 10 1:1000
CAD FILE NO. V106373-01-P1.dgn

WONTHAGGI NORTH EAST PSP
HESLOP ROAD / ST CLAIRE BOULEVARD
INTERSECTION 2
CONCEPT LAYOUT
DRAWING NO. V106373-01 ISSUE P1

GTAconsultants

V106373: Wonthaggi North East PSP - Heslop Rd / St Claire Boulevard					
Civil Construction					
Date	**7/02/2020**				
Basis of Estimate					
This cost estimate is based on GTA plan V106373-01 P1 dated 06 May 2019					
	Heslop Rd / St Claire Boulevard - Proposed T intersection				
Item	**Description of works**	**Quantity**	**Unit**	**Rate**	**Amount**
1.00	**GENERAL**				
1.01	Site establishment	1	Item	$ 10,000.00	$ 10,000.00
1.02	Insurance	1	Item	$ 2,000.00	$ 2,000.00
1.03	Traffic Management and Control	60	Day	$ 750.00	$ 45,000.00
1.04	Supervision	1	Item	$ 10,000.00	$ 10,000.00
1.05	Surveying	1	Item	$ 8,000.00	$ 8,000.00
1.06	Sedimentation Control	1	Item	$ 1,500.00	$ 1,500.00
1.07	As Built Drawing preparation as per council and Vic Roads requirement	1	Item	$ 1,500.00	$ 1,500.00
2.00	**DEMOLITION, SITE PREPARATION AND RELOCATION ITEMS (Including removal from site)**				
2.01	Proving existing services	1	Item	$ 5,500.00	$ 5,500.00
2.02	Saw cutting of existing pavements where required to match new pavement or kerb and channel etc.	400	Lm	$ 12.00	$ 4,800.00
2.03	Tree Removals	120	No	$ 450.00	$ 54,000.00
2.04	Permanently remove or blackout existing line marking	1	Item	$ 3,500.00	$ 3,500.00
3.00	**BULK EARTHWORKS**				
3.01	Stripping and stockpiling of selected topsoil for reuse, excavation to proposed formation levels, including trimming, rolling, cutting and shaping, compaction of subgrades, removal and disposal of trees, shrubs, spoil, surplus unapproved soil, etc. This item is to incorporate the supply and placement of fill material as specified and directed including compaction to 98% modified compaction, as per AS1289, where specified.	1	Item	$ 75,000.00	$ 75,000.00
4.00	**KERB AND CHANNEL / CONCRETE WORKS**				
	Construction of the following items including provision of all necessary plant and materials, trimming, bedding, forming, mixing, paving, jointing, making and finishing.				
4.01	**Kerb and Channel, Concrete Strength**				
	25MPa Standard				
4.01.1	Semi Mountable kerb and channel - SM2 or Council equivalent	420	Lm	$ 70.00	$ 29,400.00
5.00	**PAVEMENTS, RIGID**				
	Construction of the following items including provision of all necessary plant and materials, trimming, bedding, forming, mixing, paving, jointing, making and finishing.				
5.01	**Concrete Footpath Pavement, including bedding as specified Concrete Strength**				
	25MPa Standard				
5.01.1	125mm depth pavement, colour and finish as specified	1230	m^2	$ 125.00	$ 153,750.00
5.01.2	Construction of pram ramp in accordance with council standards	4	Item	$ 1,250.00	$ 5,000.00
5.01.3	Concrete infill	90	m^2	$ 130.00	$ 11,700.00
6.00	**PAVEMENTS, FLEXIBLE**				
	The supply and installation of the following compacted depth asphalt base and wearing courses including labour, materials, compaction and bituminous prime coat, to relevant specifications and as specified.				
6.01	**450mm Heavy duty pavement**				
6.01.1	Road pavement as specified and required	1620	m^2	$ 125.00	$ 202,500.00
6.01.2	Asphalt Resheet/Regulation with type V or H asphalt	2100	m^2	$ 45.00	$ 94,500.00
7.00	**DRAINAGE**				
7.01	**Drainage Pipes and Culverts**				
7.01.1	300mm dia RCP Class 2, RRJ	120	Lm	$ 250.00	$ 30,000.00
7.02	**Drainage Pits**				
	Excavate for and construct concrete drainage structures including all materials, plant, labour, temporary covers, final pit lid and surround, step irons, forming, mixing, pouring, finishing and barricading all inclusive, unless otherwise defined.				
7.02.1	**Side Entry Pits, as specified**				
7.02.1.1	750 x 1000	12	No	$ 1,850.00	$ 22,200.00
8.00	**AGRICULTURAL DRAINS**				
8.01	100mm dia grade 1000 AG drain, screening backfill	840	Lm	$ 55.00	$ 46,200.00
8.02	SSD Pit/ flush out riser/ outlet	8	Item	$ 1,250.00	$ 10,000.00

9.00	**DELINEATION**				
9.01	**Signage**				
9.01.1	The supply and installation/relocation of directional and advisory traffic signage all inclusive and removal of all redundant signs as specified	1	Item	$ 2,500.00	$ 2,500.00
9.02	**Line marking**				
9.02.1	Installation of proposed line marking, including but not limited to lane division lines, directional arrows, bus lane surface treatment, stopping lines and RRPM's all inclusive				
9.02.2	Thermoplastic to VicRoads standards	1	Item	$ 3,000.00	$ 3,000.00
10.00	**LANDSCAPING/TOPSOILING & REINSTATEMENT**				
10.01	Topsoiling and seeding of nature strips, medians, batters, and all disturbed areas to a min. of 150mm min depth including regrading, cultivation throughout the duration of the works and the maintenance period	600	m^2	$ 50.00	$ 30,000.00
11.00	**MISCELLANEOUS**				
11.01	Public lights	4	No	$ 12,800.00	$ 51,200.00
11.02	Final clean-up, Including demobilisation and removal of temporary structures, etc.	1	Item	$ 4,000.00	$ 4,000.00
	Sub Total _Civil				*$ 916,750.00*
	Total				***$ 916,750.00***
	Total with 10% Project Management Fee				***$ 1,008,425.00***
	Total with 10% Project Management Fee + 30% contingency				***$ 1,310,952.50***

Please also note the following assumptions and exclusions

1. Design and documentation fees or authority fees, charges, levies and overview including insurances, bank guarantees.
2. Existing services relocations and facilitation including lowering or realignment thereof.
3. Protection of underground services during construction.
4. 30% contingency applied as order of magnitude estimate has been based on desktop study.
5. Asphalt resheet has been included for the approaches of the intersection only
6. Land acquisition
7. Price escalation is not included in the estimate
8. Excludes any allowance for abnormal weather conditions
9. No allowance has been made for night-works if required
10. The above opinion of probable costs should be considered current to the date of the document only. GTA Consultants cannot provide any form of assurance that the costings provided will not change due to changes in design and/or future costs of materials. The future outcome may vary, and this variation may be material.

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Any party requiring detailed costing for quoting or construction purposes should seek a detailed cost estimate from a suitably qualified quantity surveyor.

IN-03

NOTES

DESIGN SPEED: 80KM/H
POSTED SPEED: 80KM/H
DESIGN VEHICLE: 25.0m B-DOUBLE

KORUMBURRA - WONTHAGGI

LIMIT OF WORKS

DIVERGE LENGTH

80.0
DIVERGE LENGTH

25.0
TAPER

75.0
STORAGE

15.0

10.0

15.0

80.0
DIVERGE LENGTH

ROAD

LIMIT OF WORKS

75.0
STORAGE

25.0
TAPER

6.1

8.5

ROAD

LIMIT OF WORKS

HESLOP

N

PLOTTED BY : hakan.girgin ON 1/08/2017 AT 4:29:57 PM

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Townsville	07 4722 2765
Perth	08 6169 1000

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PRELIMINARY PLAN
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DESIGNED J.MAURO	DESIGN CHECK -
APPROVED BY H.GIRGIN	DATE ISSUED 19 APRIL 2017

SCALE A3 — 0 5 10 — 1:1000

CAD FILE NO. V106370-SK04-P1.dgn

WONTHAGGI NORTH EAST PSP
HESLOP ROAD / KORUMBURRA - WONTHAGGI ROAD
INTERSECTION 3
CONCEPT LAYOUT

DRAWING NO. V106370-SK04 ISSUE P1

GTAconsultants

V106370: Wonthaggi North East PSP - Heslop Rd / Korumburra - Wonthaggi Rd					
Civil Construction					
Date	**7/02/2020**				
Basis of Estimate					
This cost estimate is based on GTA plan V106370-SK04 P1 dated 19 Apr 2017 (Upto the taper end along Korumburra- Wonthaggi Road and 60m along Heslop Road)					
	Heslop Rd / Korumburra - Wonthaggi Rd - Proposed T intersection				
Item	**Description of works**	**Quantity**	**Unit**	**Rate**	**Amount**
1.00	**GENERAL**				
1.01	Site establishment	1	Item	$ 10,000.00	$ 10,000.00
1.02	Insurance	1	Item	$ 2,500.00	$ 2,500.00
1.03	Traffic Management and Control	40	Day	$ 800.00	$ 32,000.00
1.04	Supervision	1	Item	$ 9,000.00	$ 9,000.00
1.05	Surveying	1	Item	$ 7,000.00	$ 7,000.00
1.06	Sedimentation Control	1	Item	$ 2,500.00	$ 2,500.00
1.07	As Built Drawing preparation as per council and Vic Roads requirement	1	Item	$ 1,500.00	$ 1,500.00
2.00	**DEMOLITION, SITE PREPARATION AND RELOCATION ITEMS (Including removal from site)**				
2.01	Proving existing services	1	Item	$ 7,500.00	$ 7,500.00
2.02	Tree Removals	10	No	$ 200.00	$ 2,000.00
3.00	**BULK EARTHWORKS**				
3.01	Stripping and stockpiling of selected topsoil for reuse, excavation to proposed formation levels, including trimming, rolling, cutting and shaping, compaction of subgrades, removal and disposal of trees, shrubs, spoil, surplus unapproved soil, etc. This item is to incorporate the supply and placement of fill material as specified and directed including compaction to 98% modified compaction, as per AS1289, where specified.	1	Item	$ 60,000.00	$ 60,000.00
4.00	**KERB AND CHANNEL / CONCRETE WORKS**				
	Construction of the following items including provision of all necessary plant and materials, trimming, bedding, forming, mixing, paving, jointing, making and finishing.				
4.01	**Kerb and Channel, Concrete Strength**				
	25MPa Standard				
4.01.1	Semi Mountable kerb and channel - SM2 or Council equivalent	280	Lm	$ 70.00	$ 19,600.00
5.00	**PAVEMENTS, RIGID**				
	Construction of the following items including provision of all necessary plant and materials, trimming, bedding, forming, mixing, paving, jointing, making and finishing.				
5.01	**Concrete Footpath Pavement, including bedding as specified Concrete Strength**				
	25MPa Standard				
5.01.1	125mm depth pavement, colour and finish as specified	150	m^2	$ 125.00	$ 18,750.00
5.01.2	Reconstruction of pram ramp in accordance with council standards	2	Item	$ 1,250.00	$ 2,500.00
6.00	**PAVEMENTS, FLEXIBLE**				
	The supply and installation of the following compacted depth asphalt base and wearing courses including labour, materials, compaction and bituminous prime coat, to relevant specifications and as specified.				
6.01	**600mm Heavy duty pavement**				
6.01.1	Road pavement as specified and required	2600	m^2	$ 125.00	$ 325,000.00
6.01.2	Asphalt Regulation works	2140	m^2	$ 45.00	$ 96,300.00

7.00	**DRAINAGE**				
7.01	**Drainage Pipes and Culverts**				
7.01.1	300mm dia RCP Class 2, RRJ	60	Lm	$ 250.00	$ 15,000.00
	Box Culvert extension	1	Item	$ 40,000.00	$ 40,000.00
7.02	**Drainage Pits**				
	Excavate for and construct concrete drainage structures including all materials, plant, labour, temporary covers, final pit lid and surround, step irons, forming, mixing, pouring, finishing and barricading all inclusive, unless otherwise defined.				
7.02.1	**Side Entry Pits, as specified**				
7.02.1.1	900 x 900	6	No	$ 1,850.00	$ 11,100.00
7.02.2	**Other**				
7.02.2.1	End wall for RCBC as required	1	Item	$ 10,000.00	$ 10,000.00
8.00	**AGRICULTURAL DRAINS**				
8.01	100mm dia grade 1000 AG drain, screening backfill	280	Lm	$ 55.00	$ 15,400.00
8.02	SSD Pit/ flush out riser/ outlet	6	Item	$ 1,250.00	$ 7,500.00
9.00	**DELINEATION**				
9.01	**Signage**				
9.01.1	The supply and installation/relocation of directional and advisory traffic signage all inclusive and removal of all redundant signs as specified	1	Item	$ 3,000.00	$ 3,000.00
9.02	**Line marking**				
9.02.1	Installation of proposed line marking, including but not limited to lane division lines, directional arrows, bus lane surface treatment, stopping lines and RRPM's all inclusive				
9.02.2	Thermoplastic to vicroads standards	1	Item	$ 3,500.00	$ 3,500.00
10.00	**LANDSCAPING/TOPSOILING & REINSTATEMENT**				
10.01	Topsoiling and seeding of nature strips, medians, batters, and all disturbed areas to a min. of 150mm min depth including regrading, cultivation throughout the duration of the works and the maintenance period	1200	m^2	$ 50.00	$ 60,000.00
11.00	**MISCELLANEOUS**				
11.01	Public lights	5	No	$ 12,800.00	$ 64,000.00
11.02	Guard fence protection	540	Lm	$ 80.00	$ 43,200.00
11.03	End Terminals - Guard fence (MASH)	5	No	$ 6,000.00	$ 30,000.00
11.04	Final clean-up, Including demobilisation and removal of temporary structures, etc.	1	Item	$ 4,000.00	$ 4,000.00
	Sub Total _Civil				*$ 902,850.00*
	Total				***$ 902,850.00***
	Total with 10% Project Management Fee				***$ 993,135.00***
	Total with 10% Project Management Fee + 30% contingency				***$ 1,291,075.50***

Please also note the following assumptions and exclusions

1. Design and documentation fees or authority fees, charges, levies and overview including insurances, bank guarantees.
2. Existing services relocations and facilitation including lowering or realignment thereof.
3. Protection of underground services during construction.
4. 30% contingency applied as order of magnitude estimate has been based on desktop study.
5. Asphalt resheet has been included for the approaches of the intersection only
6. Land acquisition
7. Price escalation is not included in the estimate
8. Excludes any allowance for abnormal weather conditions
9. No allowance has been made for night-works if required

The above opinion of probable costs should be considered current to the date of the document only. GTA Consultants cannot provide any form of assurance that the costings provided will not change due to changes in design and/or future costs of materials. The future outcome may vary, and this variation may be material.

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IN-04

NOTES

DESIGN SPEED: 60KM/H
POSTED SPEED: 60KM/H
DESIGN VEHICLE: 25.0m B-DOUBLE

EXISTING PROPERTY BOUNDARIES
PROPOSED PROPERTY BOUNDARIES
ENTRY PATH RADII
70.0m CRITERION 2 SIGHT DISTANCE (5s GAP ON ARTERIAL ROAD)

SAINT CLAIR ROAD

KORUMBURRA - WONTHAGGI

BOULEVARD

LIMIT OF WORKS

LAND ACQUISITION
A= 1170m sqr

LAND ACQUISITION
A= 1066m sqr

N

ON 7/10/2020 AT 6:19:22 PM
PLOTTED BY : Aaron.Whale

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PRELIMINARY PLAN
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DESIGNED A. WHALE
DESIGN CHECK A. DELL'ISOLA
APPROVED BY A. FARRAN
DATE ISSUED 7 OCTOBER 2020

SCALE A3 0 10 20 1:1000
CAD FILE NO. V106370-SK05-P5.dgn

WONTHAGGI NORTH EAST PSP
KORUMBURRA - WONTHAGGI RD / ST CLAIRE BLVD
INTERSECTION 4
CONCEPT LAYOUT
DRAWING NO. V106370-SK05 ISSUE P5

GTAconsultants

V106370: Wonthaggi North East PSP - Korumburra-Wonthaggi Rd / St Claire Blvd					
Civil Construction					
Date	**6/10/2020**				
Basis of Estimate					
This cost estimate is based on GTA plan V106370-SK05 P4 dated 1 Oct 2020 (Limit of works as highlighted)					
	Korumburra-Wonthaggi Rd / St Claire Blvd - Proposed Roundabout - Option 1				
Item	**Description of works**	**Quantity**	**Unit**	**Rate**	**Amount**
1.00	**GENERAL**				
1.01	Site establishment	1	Item	$ 20,000.00	$ 20,000.00
1.02	Insurance	1	Item	$ 4,000.00	$ 4,000.00
1.03	Traffic Management and Control	90	Day	$ 800.00	$ 72,000.00
1.04	Supervision	1	Item	$ 20,000.00	$ 20,000.00
1.05	Surveying	1	Item	$ 10,000.00	$ 10,000.00
1.06	Sedimentation Control	1	Item	$ 2,500.00	$ 2,500.00
1.07	As Built Drawing preparation as per council and Vic Roads requirement	1	Item	$ 2,000.00	$ 2,000.00
2.00	**DEMOLITION, SITE PREPARATION AND RELOCATION ITEMS (Including removal from site)**				
2.01	Proving existing services	1	Item	$ 8,000.00	$ 8,000.00
2.02	Saw cutting of existing pavements where required to match new pavement or kerb and channel etc.	20	Lm	$ 12.00	$ 240.00
2.03	Permanently remove or blackout existing line marking	20	Lm	$ 20.00	$ 400.00
3.00	**BULK EARTHWORKS**				
3.01	Stripping and stockpiling of selected topsoil for reuse, excavation to proposed formation levels, including trimming, rolling, cutting and shaping, compaction of subgrades, removal and disposal of trees, shrubs, spoil, surplus unapproved soil, etc. This item is to incorporate the supply and placement of fill material as specified and directed including compaction to 98% modified compaction, as per AS1289, where specified.	1	Item	$ 120,000.00	$ 120,000.00
4.00	**KERB AND CHANNEL / CONCRETE WORKS**				
	Construction of the following items including provision of all necessary plant and materials, trimming, bedding, forming, mixing, paving, jointing, making and finishing.				
4.01	**Kerb and Channel, Concrete Strength**				
	25MPa Standard				
4.01.1	Semi Mountable kerb and channel - SM2 or Council equivalent	855	Lm	$ 70.00	$ 59,850.00
5.00	**PAVEMENTS, RIGID**				
	Construction of the following items including provision of all necessary plant and materials, trimming, bedding, forming, mixing, paving, jointing, making and finishing.				
5.01	**Concrete Footpath Pavement, including bedding as specified Concrete Strength**				
	25MPa Standard				
5.01.1	125mm depth pavement, colour and finish as specified	360	m^2	$ 125.00	$ 45,000.00
5.01.2	Reconstruction of pram ramp in accordance with council standards	8	Item	$ 1,250.00	$ 10,000.00
5.01.3	Concrete infill	840	m^2	$ 130.00	$ 109,200.00
6.00	**PAVEMENTS, FLEXIBLE**				
	The supply and installation of the following compacted depth asphalt base and wearing courses including labour, materials, compaction and bituminous prime coat, to relevant specifications and as specified.				
6.01	**600mm Heavy duty pavement**				
6.01.1	Road pavement as specified and required	2970	m^2	$ 125.00	$ 371,250.00
6.01.2	Asphalt Resheet with type V asphalt	200	m^2	$ 45.00	$ 9,000.00

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7.00	**DRAINAGE**				
7.01	**Drainage Pipes and Culverts**				
7.01.1	300mm dia RCP Class 2, RRJ	140	Lm	$ 250.00	$ 35,000.00
7.02	**Drainage Pits**				
	Excavate for and construct concrete drainage structures including all materials, plant, labour, temporary covers, final pit lid and surround, step irons, forming, mixing, pouring, finishing and barricading all inclusive, unless otherwise defined.				
7.02.1	**Side Entry Pits, as specified**				
7.02.1.1	750 x 1000	16	No	$ 1,850.00	$ 29,600.00
8.00	**AGRICULTURAL DRAINS**				
8.01	100mm dia grade 1000 AG drain, screening backfill	860	Lm	$ 55.00	$ 47,300.00
8.02	SSD Pit/ flush out riser/ outlet	8	Item	$ 1,250.00	$ 10,000.00
9.00	**DELINEATION**				
9.01	**Signage**				
9.01.1	The supply and installation/relocation of directional and advisory traffic signage all inclusive and removal of all redundant signs as specified	1	Item	$ 5,000.00	$ 5,000.00
9.02	**Line marking**				
9.02.1	Installation of proposed line marking, including but not limited to lane division lines, directional arrows, bus lane surface treatment, stopping lines and RRPM's all inclusive				
9.02.2	Thermoplastic to VicRoads standards	1	Item	$ 6,000.00	$ 6,000.00
10.00	**LANDSCAPING/TOPSOILING & REINSTATEMENT**				
10.01	Topsoiling and seeding of nature strips, medians, batters, and all disturbed areas to a min. of 150mm min depth including regrading, cultivation throughout the duration of the works and the maintenance period	800	m^2	$ 50.00	$ 40,000.00
11.00	**MISCELLANEOUS**				
11.01	Public lights	11	No	$ 12,800.00	$ 140,800.00
11.02	Final clean-up, Including demobilisation and removal of temporary structures, etc.	1	Item	$ 4,500.00	$ 4,500.00
	Sub Total _Civil				*$ 1,181,640.00*
	Total				***$ 1,181,640.00***
	Total with 10% Project Management Fee				***$ 1,299,804.00***
	Total with 10% Project Management Fee + 30% contingency				***$ 1,689,745.20***

Please also note the following assumptions and exclusions

1. Design and documentation fees or authority fees, charges, levies and overview including insurances, bank guarantees.
2. Existing services relocations and facilitation including lowering or realignment thereof.
3. Protection of underground services during construction.
4. 30% contingency applied as order of magnitude estimate has been based on desktop study.
5. Asphalt resheet has been included for the approaches of the intersection only
6. Land acquisition
7. Price escalation is not included in the estimate
8. Excludes any allowance for abnormal weather conditions
9. No allowance has been made for night-works if required

The above opinion of probable costs should be considered current to the date of the document only. GTA Consultants cannot provide any form of assurance that the costings provided will not change due to changes in design and/or future costs of materials. The future outcome may vary, and this variation may be material.
This potential for variation should be considered in any circumstances where the costings are to be used for high level budgeting purposes, even in the short term.
Any party requiring detailed costing for quoting or construction purposes should seek a detailed cost estimate from a suitably qualified quantity surveyor.

IN-05

NOTES

DESIGN SPEED: 60KM/H
POSTED SPEED: 60KM/H
DESIGN VEHICLES:
- BASS HWY - 25.0m B-DOUBLE
- CARNEYS RD SOUTH - 25.0m B-DOUBLE
- CARNEYS RD NORTH - 19.0m SEMI-TRAILER

EXISTING PROPERTY BOUNDARIES
PROPOSED PROPERTY BOUNDARIES
ENTRY PATH RADII
70.0m CRITERION 2 SIGHT DISTANCE (5s GAP ON ARTERIAL ROAD)

N

ROAD
BASS
CARNEYS
HIGHWAY
641sqm
133sqm
55.0
31.6
7.0
1.5
R30.0
5.0
7.0
1.5
35.7
4.0
5.0
R55.0
9.0
24.0
1.0
6.0
2.0
3.5

PLOTTED BY : Aaron.Whale ON 5/10/2020 AT 6:18:12 PM

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PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

DESIGNED	A. WHALE
DESIGN CHECK	A. DELLISOLA
APPROVED BY	A. FARRAN
DATE ISSUED	5 OCTOBER 2020
SCALE	A3
	0 10 20 1:1000
CAD FILE NO.	V106372-01-P5.dgn

WONTHAGGI NORTH EAST PSP
BASS HIGHWAY ROAD WIDENING
BASS HIGHWAY & CARNEYS ROAD PROPOSED ROUNDABOUT CONCEPT LAYOUT

DRAWING NO. V106370-01-01 SHEET 01 OF 03 ISSUE P5

GTAconsultants

V106370: Wonthaggi North East PSP - Bass Hwy / Carneys Rd					
Civil Construction					
Date	**9/10/2020**				
Basis of Estimate					
This cost estimate is based on GTA plan V106370-01-01 - P5 dated 5 Oct 2020 (Approximately 55m of each legs)					
	Bass Hwy / Carneys Rd - Proposed Roundabout				
Item	**Description of works**	**Quantity**	**Unit**	**Rate**	**Amount**
1.00	**GENERAL**				
1.01	Site establishment	1	Item	$ 16,000.00	$ 16,000.00
1.02	Insurance	1	Item	$ 3,500.00	$ 3,500.00
1.03	Traffic Management and Control	80	Day	$ 900.00	$ 72,000.00
1.04	Supervision	1	Item	$ 20,000.00	$ 20,000.00
1.05	Surveying	1	Item	$ 10,000.00	$ 10,000.00
1.06	Sedimentation Control	1	Item	$ 3,500.00	$ 3,500.00
1.07	As Built Drawing preparation as per council and Vic Roads requirement	1	Item	$ 2,000.00	$ 2,000.00
2.00	**DEMOLITION, SITE PREPARATION AND RELOCATION ITEMS (Including removal from site)**				
2.01	Proving existing services	1	Item	$ 12,000.00	$ 12,000.00
2.02	Breakout and remove redundant existing kerb and channel	80	Lm	$ 15.00	$ 1,200.00
2.03	Saw cutting of existing pavements where required to match new pavement or kerb and channel etc.	130	Lm	$ 12.00	$ 1,560.00
2.04	Tree Removals	40	No	$ 160.00	$ 6,400.00
2.05	Remove redundant end wall	1	Item	$ 400.00	$ 400.00
2.06	Permanently remove or blackout existing line marking	100	Lm	$ 20.00	$ 2,000.00
3.00	**BULK EARTHWORKS**				
3.01	Stripping and stockpiling of selected topsoil for reuse, excavation to proposed formation levels, including trimming, rolling, cutting and shaping, compaction of subgrades, removal and disposal of trees, shrubs, spoil, surplus unapproved soil, etc. This item is to incorporate the supply and placement of fill material as specified and directed including compaction to 98% modified compaction, as per AS1289, where specified.	1	Item	$ 120,000.00	$ 120,000.00
3.02	Trimming of subgrade under kerbs as necessary to provide 100mm min. bedding depth	1	Item	$ 2,000.00	$ 2,000.00
4.00	**KERB AND CHANNEL / CONCRETE WORKS**				
	Construction of the following items including provision of all necessary plant and materials, trimming, bedding, forming, mixing, paving, jointing, making and finishing.				
4.01	**Kerb and Channel, Concrete Strength**				
	25MPa Standard				
4.01.1	Semi Mountable kerb and channel - SM2 or Council equivalent	610	Lm	$ 70.00	$ 42,700.00
5.00	**PAVEMENTS, RIGID**				
	Construction of the following items including provision of all necessary plant and materials, trimming, bedding, forming, mixing, paving, jointing, making and finishing.				
5.01	**Concrete Footpath Pavement, including bedding as specified Concrete Strength**				
	25MPa Standard				
5.01.1	125mm depth pavement, colour and finish as specified	600	m^2	$ 125.00	$ 75,000.00
5.01.2	Reconstruction of pram ramp in accordance with council standards	8	Item	$ 1,250.00	$ 10,000.00
5.01.3	Concrete infill	1300	m^2	$ 130.00	$ 169,000.00

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6.00	**PAVEMENTS, FLEXIBLE**				
	The supply and installation of the following compacted depth asphalt base and wearing courses including labour, materials, compaction and bituminous prime coat, to relevant specifications and as specified.				
6.01	**450mm Heavy duty pavement**				
6.01.1	Road pavement as specified and required	3050	m^2	$ 125.00	$ 381,250.00
6.01.2	Asphalt Resheet with type V or other type asphalt	500	m^2	$ 45.00	$ 22,500.00
7.00	**DRAINAGE**				
7.01	**Drainage Pipes and Culverts**				
7.01.1	300mm dia RCP Class 2, RRJ	110	Lm	$ 250.00	$ 27,500.00
7.01.2	450 X 300 RCBC	24	Lm	$ 450.00	$ 10,800.00
7.02	**Drainage Pits**				
	Excavate for and construct concrete drainage structures including all materials, plant, labour, temporary covers, final pit lid and surround, step irons, forming, mixing, pouring, finishing and barricading all inclusive, unless otherwise defined.				
7.02.1	**Side Entry Pits, as specified**				
7.02.1.1	750 x 1000	14	No	$ 1,850.00	$ 25,900.00
7.02.2	**Other**				
7.02.2.1	End wall as required	3	Item	$ 2,500.00	$ 7,500.00
8.00	**AGRICULTURAL DRAINS**				
8.01	100mm dia grade 1000 AG drain, screening backfill	610	Lm	$ 55.00	$ 33,550.00
8.02	SSD Pit/ flushout riser/ outlet	8	Item	$ 1,250.00	$ 10,000.00
9.00	**DELINEATION**				
9.01	**Signage**				
9.01.1	The supply and installation/relocation of directional and advisory traffic signage all inclusive and removal of all redundant signs as specified	1	Item	$ 5,000.00	$ 5,000.00
9.02	**Line marking**				
9.02.1	Installation of proposed line marking, including but not limited to lane division lines, directional arrows, bus lane surface treatment, stopping lines and RRPM's all inclusive				
9.02.2	Thermoplastic to vicroads standards	1	Item	$ 6,000.00	$ 6,000.00
10.00	**LANDSCAPING/TOPSOILING & REINSTATEMENT**				
10.01	Topsoiling and seeding of nature strips, medians, batters, and all disturbed areas to a min. of 150mm min depth including regrading, cultivation throughout the duration of the works and the maintenance period	650	m^2	$ 50.00	$ 32,500.00
11.00	**MISCELLANEOUS**				
11.01	Public lights	9	No	$ 12,800.00	$ 115,200.00
11.02	Final clean-up, Including demobilisation and removal of temporary structures, etc.	1	Item	$ 5,500.00	$ 5,500.00
	Sub Total _Civil				*$ 1,252,460.00*
	Total				***$ 1,252,460.00***
	Total with 10% Project Management Fee				***$ 1,377,706.00***
	Total with 10% Project Management Fee + 30% contingency				***$ 1,791,017.80***

Please also note the following assumptions and exclusions

1. Design and documentation fees or authority fees, charges, levies and overview including insurances, bank guarantees.
2. Existing services relocations and facilitation including lowering or realignment thereof.
3. Protection of underground services during construction.
4. 30% contingency applied as order of magnitude estimate has been based on desktop study.
5. Asphalt resheet has been included for the approaches of the intersection only
6. Land acquisition
7. Price escalation is not included in the estimate
8. Excludes any allowance for abnormal weather conditions
9. No allowance has been made for night-works if required

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IN-06

NOTES

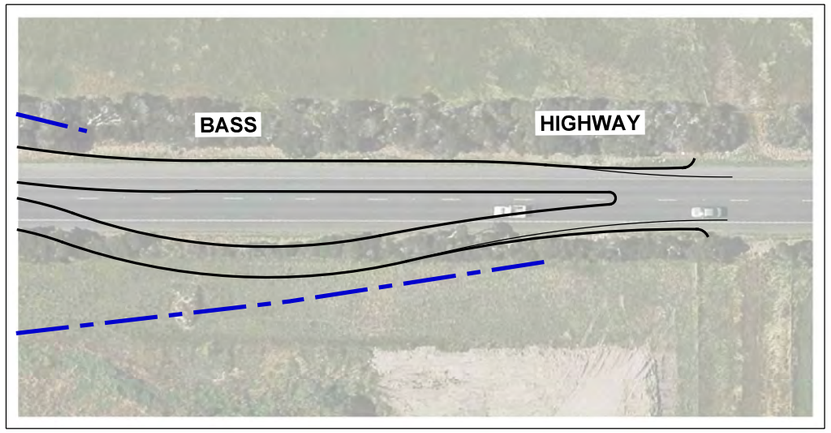
DESIGN SPEED:
- BASS HWY - 80KM/H
- ST CLAIRE BLVD - 60KM/H

POSTED SPEED:
- BASS HWY - 80KM/H
- ST CLAIRE BLVD - 60KM/H

DESIGN VEHICLE:
- BASS HWY - 25.0m B-DOUBLE
- ST CLAIRE BLVD - 19.0m SEMI-TRAILER

EXISTING PROPERTY BOUNDARIES

N



INSET

BASS

HIGHWAY

BOULEVARD

CLAIR

SAINT

2.0
3.5
2.0
3.5

FOR CONTINUATION REFER TO INSET

PLOTTED BY : brendan.klinko ON 19/12/2019 AT 5:54:24 PM

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PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

WARNING
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DESIGNED A. WHALE
DESIGN CHECK A. DELLISOLA
APPROVED BY A. FARRAN
DATE ISSUED 19 DECEMBER 2019

SCALE A3 0 10 20 1:1000
CAD FILE NO. V106372-01-P3.dgn

WONTHAGGI NORTH EAST PSP
BASS HIGHWAY ROAD WIDENING

CONCEPT LAYOUT

DRAWING NO. V106370-01-03 SHEET 03 OF 03 ISSUE P3

GTAconsultants

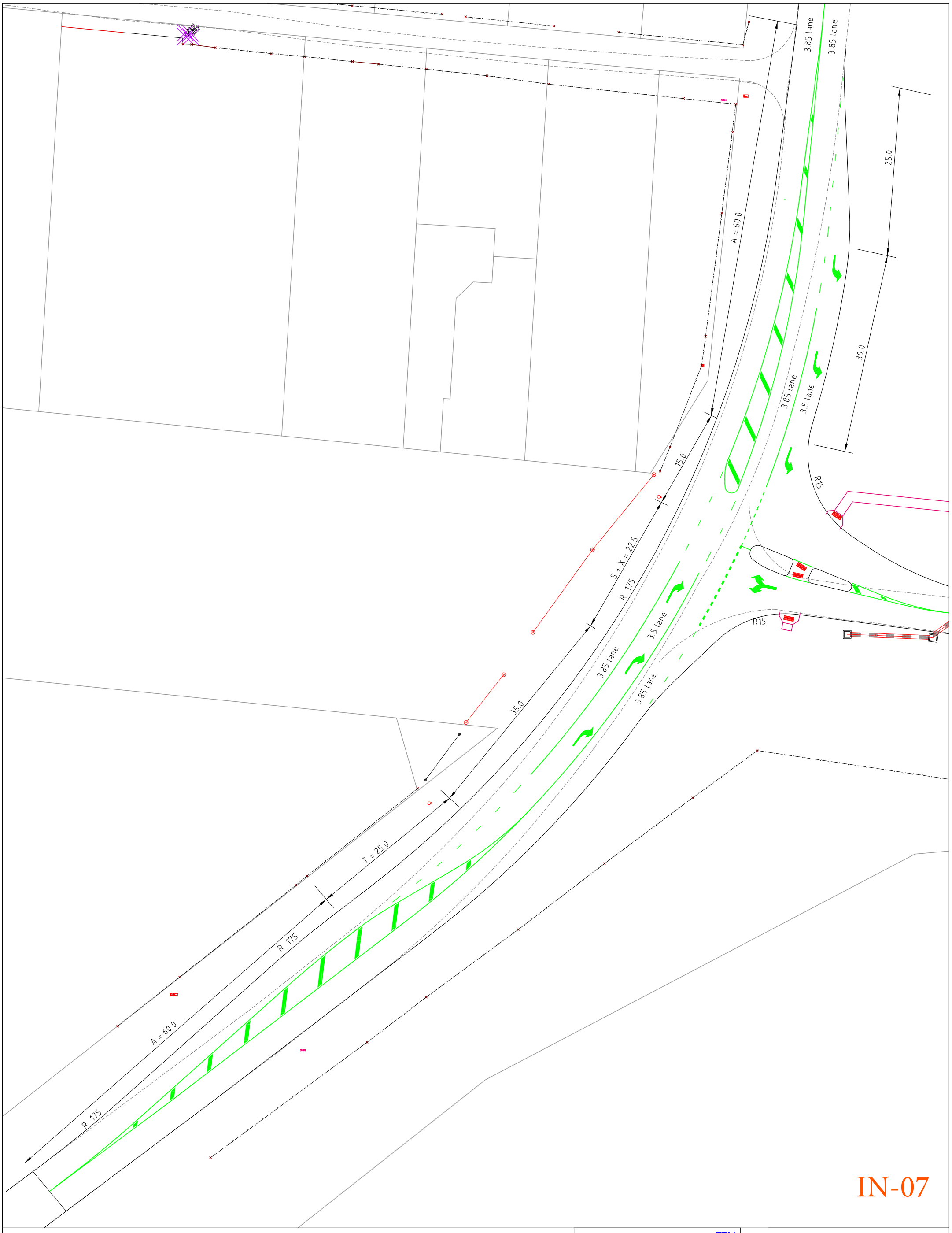
V106370: Wonthaggi North East PSP - Bass Hwy / St Claire Blvd					
Civil Construction					
Date	**7/02/2020**				
Basis of Estimate					
This cost estimate is based on GTA plan V106370-SK07 P2 dated 29 May 2017 (Approximately 150m of Bass Highway legs and 50m of Saint Clair Boulevard legs)					
	Bass Hwy / St Claire Blvd - Proposed Roundabout				
Item	**Description of works**	**Quantity**	**Unit**	**Rate**	**Amount**
1.00	**GENERAL**				
1.01	Site establishment	1	Item	$ 18,000.00	$ 18,000.00
1.02	Insurance	1	Item	$ 4,000.00	$ 4,000.00
1.03	Traffic Management and Control	75	Day	$ 800.00	$ 60,000.00
1.04	Supervision	1	Item	$ 18,000.00	$ 18,000.00
1.05	Surveying	1	Item	$ 10,000.00	$ 10,000.00
1.06	Sedimentation Control	1	Item	$ 3,000.00	$ 3,000.00
1.07	As Built Drawing preparation as per council and Vic Roads requirement	1	Item	$ 1,800.00	$ 1,800.00
2.00	**DEMOLITION, SITE PREPARATION AND RELOCATION ITEMS (Including removal from site)**				
2.01	Proving existing services	1	Item	$ 8,000.00	$ 8,000.00
2.02	Saw cutting of existing pavements where required to match new pavement or kerb and channel etc.	40	Lm	$ 12.00	$ 480.00
2.03	Tree Removals	20	No	$ 160.00	$ 3,200.00
2.04	Permanently remove or blackout existing line marking	40	Lm	$ 20.00	$ 800.00
3.00	**BULK EARTHWORKS**				
3.01	Stripping and stockpiling of selected topsoil for reuse, excavation to proposed formation levels, including trimming, rolling, cutting and shaping, compaction of subgrades, removal and disposal of trees, shrubs, spoil, surplus unapproved soil, etc. This item is to incorporate the supply and placement of fill material as specified and directed including compaction to 98% modified compaction, as per AS1289, where specified.	1	Item	$ 125,000.00	$ 125,000.00
4.00	**KERB AND CHANNEL / CONCRETE WORKS**				
	Construction of the following items including provision of all necessary plant and materials, trimming, bedding, forming, mixing, paving, jointing, making and finishing.				
4.01	**Kerb and Channel, Concrete Strength**				
	25MPa Standard				
4.01.1	Semi Mountable kerb and channel - SM2 or Council equivalent	1550	Lm	$ 70.00	$ 108,500.00
5.00	**PAVEMENTS, RIGID**				
	Construction of the following items including provision of all necessary plant and materials, trimming, bedding, forming, mixing, paving, jointing, making and finishing.				
5.01	**Concrete Footpath Pavement, including bedding as specified Concrete Strength**				
	25MPa Standard				
5.01.1	125mm depth pavement, colour and finish as specified	1080	m^2	$ 125.00	$ 135,000.00
5.01.2	Reconstruction of pram ramp in accordance with council standards	8	Item	$ 1,250.00	$ 10,000.00
5.01.3	Concrete infill	385	m^2	$ 130.00	$ 50,050.00
6.00	**PAVEMENTS, FLEXIBLE**				
	The supply and installation of the following compacted depth asphalt base and wearing courses including labour, materials, compaction and bituminous prime coat, to relevant specifications and as specified.				
6.01	**600mm Heavy duty pavement**				
6.01.1	Road pavement as specified and required	5200	m^2	$ 125.00	$ 650,000.00
6.01.2	Asphalt Resheet with type V asphalt	200	m^2	$ 45.00	$ 9,000.00
7.00	**DRAINAGE**				
7.01	**Drainage Pipes and Culverts**				
7.01.1	375mm dia RCP Class 2, RRJ	150	Lm	$ 300.00	$ 45,000.00
7.02	**Drainage Pits**				
	Excavate for and construct concrete drainage structures including all materials, plant, labour, temporary covers, final pit lid and surround, step irons, forming, mixing, pouring, finishing and barricading all inclusive, unless otherwise defined.				
7.02.1	**Side Entry Pits, as specified**				
7.02.1.1	750 x 1000	12	No	$ 1,850.00	$ 22,200.00

8.00	**AGRICULTURAL DRAINS**				
8.01	100mm dia grade 1000 AG drain, screening backfill	950	Lm	$ 55.00	$ 52,250.00
8.02	SSD Pit/ flush out riser/ outlet	12	Item	$ 1,250.00	$ 15,000.00
9.00	**DELINEATION**				
9.01	**Signage**				
9.01.1	The supply and installation/relocation of directional and advisory traffic signage all inclusive and removal of all redundant signs as specified	1	Item	$ 6,000.00	$ 6,000.00
9.02	**Line marking**				
9.02.1	Installation of proposed line marking, including but not limited to lane division lines, directional arrows, bus lane surface treatment, stopping lines and RRPM's all inclusive				
9.02.2	Thermoplastic to VicRoads standards	1	Item	$ 6,500.00	$ 6,500.00
10.00	**LANDSCAPING/TOPSOILING & REINSTATEMENT**				
10.01	Topsoiling and seeding of nature strips, medians, batters, and all disturbed areas to a min. of 150mm min depth including regrading, cultivation throughout the duration of the works and the maintenance period	3550	m^2	$ 50.00	$ 177,500.00
11.00	**MISCELLANEOUS**				
11.01	Public lights	16	No	$ 12,800.00	$ 204,800.00
11.02	Final clean-up, Including demobilisation and removal of temporary structures, etc.	1	Item	$ 4,000.00	$ 4,000.00
	Sub Total _Civil				*$ 1,748,080.00*
	Total				***$ 1,748,080.00***
	Total with 10% Project Management Fee				***$ 1,922,888.00***
	Total with 10% Project Management Fee + 30% contingency				***$ 2,499,754.40***

Please also note the following assumptions and exclusions

1. Design and documentation fees or authority fees, charges, levies and overview including insurances, bank guarantees.
2. Existing services relocations and facilitation including lowering or realignment thereof.
3. Protection of underground services during construction.
4. 30% contingency applied as order of magnitude estimate has been based on desktop study.
5. Asphalt resheet has been included for the approaches of the intersection only
6. Land acquisition
7. Price escalation is not included in the estimate
8. Excludes any allowance for abnormal weather conditions
9. No allowance has been made for night-works if required

The above opinion of probable costs should be considered current to the date of the document only. GTA Consultants cannot provide any form of assurance that the costings provided will not change due to changes in design and/or future costs of materials. The future outcome may vary, and this variation may be material.
Any party requiring detailed costing for budgeting, quoting or construction purposes should seek a detailed cost estimate from a suitably qualified quantity surveyor.



IN-07

Issue	Appd	Date	Comments
D	JDH	5/11/17	Further modifications per VicRoads
C	JDH	7/07/17	Further modifications per VicRoads
B	DJH	12/11/14	Splitter Island provided per VicRoads
A	DJH	26/05/14	Original Issue

N

TTM Consulting Pty Ltd
Transport and Traffic Engineers
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Collingwood VIC 3066
Ph : (03) 9419 0911 Fax : (03) 9415 9456
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PARKLANDS DEVELOPMENT
WONTHAGGI
INTERSECTION McGIBBONYS ROAD AND KORUMBURRA ROAD
FUNCTIONAL LAYOUT PLAN

Scale 0 5 10 — 1:500 @ A3

Drawing No : 7402311

Sheet No : 1 Issue : D

GTAconsultants

V106370: Wonthaggi North East PSP - Korumburra Road & McGibbonys Road Intersection Upgrade						
Civil Construction						
Date	**7/02/2020**					
Basis of Estimate						
This opinion of probable cost estimate is based on TTM Consulting Pty Ltd Functional layout plan 7402311 D dated 05 Nov 2017 with sketch V106370/SK/100 including 245m internal road						
	Korumburra Road & McGibbonys Road Intersection Upgrade					
Item	**Description of Works**	**Quantity**	**Unit**	**Rate**		**Amount**
1.00	**GENERAL**					
1.01	Site establishment	1	Item	$ 16,000.00	$	16,000.00
1.02	Insurance	1	Item	$ 1,500.00	$	1,500.00
1.03	Traffic Management and Control	60	Day	$ 900.00	$	54,000.00
1.04	Supervision	1	Item	$ 50,000.00	$	50,000.00
1.05	Surveying	1	Item	$ 8,500.00	$	8,500.00
1.06	Sedimentation Control	1	Item	$ 6,500.00	$	6,500.00
1.07	As Built Drawing preparation as per council and Vic Roads requirement	1	Item	$ 1,800.00	$	1,800.00
2.00	**DEMOLITION, SITE PREPARATION AND RELOCATION ITEMS (Including removal from site)**					
2.01	Proving existing services	1	Item	$ 10,000.00	$	10,000.00
2.02	Saw cutting of existing pavements where required to match new pavement or kerb and channel etc.	450	Lm	$ 12.00	$	5,400.00
2.03	Tree Removals	5	No	$ 450.00	$	2,250.00
2.04	Permanently remove or blackout existing line marking	10	Lm	$ 20.00	$	200.00
3.00	**BULK EARTHWORKS**					
3.01	Stripping and stockpiling of selected topsoil for reuse, excavation to proposed formation levels, including trimming, rolling, cutting and shaping, compaction of subgrades, removal and disposal of trees, shrubs, spoil, surplus unapproved soil, etc. This item is to incorporate the supply and placement of fill material as specified and directed including compaction to 98% modified compaction, as per AS1289, where specified.	1	Item	$ 90,000.00	$	90,000.00
4.00	**KERB AND CHANNEL / CONCRETE WORKS**					
	Construction of the following items including provision of all necessary plant and materials, trimming, bedding, forming, mixing, paving, jointing, making and finishing.					
4.01	**Kerb and Channel, Concrete Strength**					
	25MPa Standard					
4.01.1	Semi Mountable kerb and channel - SM2 or Council equivalent	940	Lm	$ 70.00	$	65,800.00
4.01.1	Semi Mountable kerb - SM1 or Council equivalent	60	Lm	$ 60.00	$	3,600.00
5.00	**PAVEMENTS, RIGID**					
	Construction of the following items including provision of all necessary plant and materials, trimming, bedding, forming, mixing, paving, jointing, making and finishing.					
5.01	**Concrete Footpath Pavement, including bedding as specified Concrete Strength**					
	25MPa Standard					
5.01.1	125mm depth pavement, colour and finish as specified	413	m^2	$ 125.00	$	51,625.00
5.01.2	Reconstruction of pram ramp and TGSI tactiles in accordance with council standards	4	Item	$ 1,250.00	$	5,000.00
5.01.3	Concrete infill	40	m^2	$ 130.00	$	5,200.00
6.00	**PAVEMENTS, FLEXIBLE**					
	The supply and installation of the following compacted depth asphalt base and wearing courses including labour, materials, compaction and bituminous prime coat, to relevant specifications and as specified.					
6.01	**600mm Heavy duty pavement**					
6.01.1	Road pavement as specified and required	2860	m^2	$ 125.00	$	357,500.00
6.01.2	Asphalt Resheet with type V asphalt	1540	m^2	$ 45.00	$	69,300.00

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	7.00	**DRAINAGE**					
	7.01	**Drainage Pipes and Culverts**					
	7.01.1	375mm dia RCP Class 2, RRJ	135	Lm	$	250.00	$ 33,750.00
	7.02	**Drainage Pits**					
		Excavate for and construct concrete drainage structures including all materials, plant, labour, temporary covers, final pit lid and surround, step irons, forming, mixing, pouring, finishing and barricading all inclusive, unless otherwise defined.					
	7.02.1	**Side Entry Pits, as specified**					
	7.02.1.1	750 x 1000	12	No	$	1,850.00	$ 22,200.00
	8.00	**AGRICULTURAL DRAINS**					
	8.01	100mm dia grade 1000 AG drain, screening backfill	1370	Lm	$	55.00	$ 75,350.00
	8.02	SSD Pit/ flush out riser/ outlet	10	Item	$	1,250.00	$ 12,500.00
	9.00	**DELINEATION**					
	9.01	**Signage**					
	9.01.1	The supply and installation/relocation of directional and advisory traffic signage all inclusive and removal of all redundant signs as specified	1	Item	$	4,000.00	$ 4,000.00
	9.02	**Line marking**					
	9.02.1	Installation of proposed line marking, including but not limited to lane division lines, directional arrows, bus lane surface treatment, stopping lines and RRPM's all inclusive					
	9.02.2	Thermoplastic to VicRoads standards	1	Item	$	7,500.00	$ 7,500.00
	10.00	**LANDSCAPING/TOPSOILING & REINSTATEMENT**					
	10.01	Topsoiling and seeding of nature strips, medians, batters, and all disturbed areas to a min. of 150mm min depth including regrading, cultivation throughout the duration of the works and the maintenance period	2480	m^2	$	50.00	$ 124,000.00
	11.00	**MISCELLANEOUS**					
	11.01	Public lighting inclusive of point of supply'.	8	No	$	12,800.00	$ 102,400.00
	11.02	Final clean-up, Including demobilisation and removal of temporary structures, etc.	1	Item	$	3,500.00	$ 3,500.00
		Sub Total _Civil					*$ 1,189,375.00*
		Total					***$ 1,189,375.00***
		Total with 10% Project Management Fee					***$ 1,308,312.50***
		Total with 10% Project Management Fee + 30% contingency					***$ 1,700,806.25***

Please also note the following assumptions and exclusions

1. Design and documentation fees or authority fees, charges, levies and overview including insurances, bank guarantees.
2. Existing services relocations and facilitation of approvals/offers for lowering or realignment thereof.
3. Protection of underground services during construction.
4. 30% contingency applied as oopinion of probable costs estimate has been based on desktop study.
5. Asphalt resheet has been included for the full intersection over existing pavement within the extent of works
6. Land acquisition
7. Price escalation and GST are not included in the opinion of probable costs
8. Excludes any allowance for abnormal weather conditions and rock boring
9. No allowance has been made for night-works if required
10. Guard fence protection and existing pavement rehabilitation (patching) are not included in the opinion of probable cost. This need to be investigated at detailed design stage
11. It is assumed that Kerb and channel along full extent of intersection works with underground stormwater drainage pit and pipe system to replace existing table drains within road verge.
12. It is also assumed that New public lighting can be installed without need to upgrade existing electrical supply.

The above opinion of probable costs should be considered current to the date of the document only. GTA Consultants cannot provide any form of assurance that the costings provided will not change due to changes in design and/or future costs of materials. The future outcome may vary, and this variation may be material.

Any party requiring detailed costing for budgeting, quoting or construction purposes should seek a detailed cost estimate from a suitably qualified quantity surveyor.

IN-08

NOTES

DESIGN SPEED: 60KM/H
POSTED SPEED: 60KM/H
DESIGN VEHICLES:
- BASS HWY - 25.0m B-DOUBLE
- JOHN ST SOUTH - 25.0m B-DOUBLE
- JOHN ST NORTH - 19.0m SEMI-TRAILER

EXISTING PROPERTY BOUNDARIES
PROPOSED PROPERTY BOUNDARIES
ENTRY PATH RADII
70.0m CRITERION 2 SIGHT DISTANCE (5s GAP ON ARTERIAL ROAD)

N

BASS HIGHWAY

382sqm

321sqm

224sqm

330sqm

30.0 STORAGE

25.0 TAPER

VERE STREET

JOHN STREET

PLOTTED BY : Aaron.Whale ON 5/10/2020 AT 6:09:30 PM

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PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

DESIGNED A. WHALE
DESIGN CHECK A. DELLISOLA
APPROVED BY A. FARRAN
DATE ISSUED 5 OCTOBER 2020

SCALE A3 1:1000
CAD FILE NO. V106372-01-P5.dgn

WONTHAGGI NORTH EAST PSP
BASS HIGHWAY ROAD WIDENING
BASS HIGHWAY & JOHN STREET - PROPOSED ROUNDABOUT CONCEPT LAYOUT

DRAWING NO. V106370-01-02 SHEET 02 OF 03 ISSUE P5

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V106370: Wonthaggi North East PSP - John Street/Bass Highway					
Civil Construction					
Date	**9/10/2020**				
Basis of Estimate					
This cost estimate is based on GTA plan V106370-01-02- P5 dated 09 October 2020 (Approximately 55m of each leg)					
	John Street/Bass Highway - Proposed Roundabout				
Item	**Description of works**	**Quantity**	**Unit**	**Rate**	**Amount**
1.00	**GENERAL**				
1.01	Site establishment	1	Item	$ 12,500.00	$ 12,500.00
1.02	Insurance	1	Item	$ 3,000.00	$ 3,000.00
1.03	Traffic Management and Control	80	Day	$ 800.00	$ 64,000.00
1.04	Supervision	1	Item	$ 15,000.00	$ 15,000.00
1.05	Surveying	1	Item	$ 8,000.00	$ 8,000.00
1.06	Sedimentation Control	1	Item	$ 2,000.00	$ 2,000.00
1.07	As Built Drawing preparation as per council and Vic Roads requirement	1	Item	$ 1,800.00	$ 1,800.00
2.00	**DEMOLITION, SITE PREPARATION AND RELOCATION ITEMS (Including removal from site)**				
2.01	Proving existing services	1	Item	$ 7,000.00	$ 7,000.00
2.02	Saw cutting of existing pavements where required to match new pavement or kerb and channel etc.	60	Lm	$ 12.00	$ 720.00
2.03	Permanently remove or blackout existing line marking	20	Lm	$ 20.00	$ 400.00
3.00	**BULK EARTHWORKS**				
3.01	Stripping and stockpiling of selected topsoil for reuse, excavation to proposed formation levels, including trimming, rolling, cutting and shaping, compaction of subgrades, removal and disposal of trees, shrubs, spoil, surplus unapproved soil, etc. This item is to incorporate the supply and placement of fill material as specified and directed including compaction to 98% modified compaction, as per AS1289, where specified.	1	Item	$ 115,000.00	$ 115,000.00
4.00	**KERB AND CHANNEL / CONCRETE WORKS**				
	Construction of the following items including provision of all necessary plant and materials, trimming, bedding, forming, mixing, paving, jointing, making and finishing.				
4.01	**Kerb and Channel, Concrete Strength**				
	25MPa Standard				
4.01.1	Semi Mountable kerb and channel - SM2 or Council equivalent	770	Lm	$ 70.00	$ 53,900.00
5.00	**PAVEMENTS, RIGID**				
	Construction of the following items including provision of all necessary plant and materials, trimming, bedding, forming, mixing, paving, jointing, making and finishing.				
5.01	**Concrete Footpath Pavement, including bedding as specified Concrete Strength**				
	25MPa Standard				
5.01.1	125mm depth pavement, colour and finish as specified	420	m^2	$ 125.00	$ 52,500.00
5.01.2	Reconstruction of pram ramp in accordance with council standards	8	Item	$ 1,250.00	$ 10,000.00
5.01.3	Concrete infill	1700	m^2	$ 130.00	$ 221,000.00
6.00	**PAVEMENTS, FLEXIBLE**				
	The supply and installation of the following compacted depth asphalt base and wearing courses including labour, materials, compaction and bituminous prime coat, to relevant specifications and as specified.				
6.01	**600mm Heavy duty pavement**				
6.01.1	Road pavement as specified and required	2840	m^2	$ 125.00	$ 355,000.00
6.01.2	Asphalt Resheet with type V asphalt	200	m^2	$ 45.00	$ 9,000.00

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7.00	**DRAINAGE**				
7.01	**Drainage Pipes and Culverts**				
7.01.1	300mm dia RCP Class 2, RRJ	80	Lm	$ 250.00	$ 20,000.00
7.02	**Drainage Pits**				
	Excavate for and construct concrete drainage structures including all materials, plant, labour, temporary covers, final pit lid and surround, step irons, forming, mixing, pouring, finishing and barricading all inclusive, unless otherwise defined.				
7.02.1	**Side Entry Pits, as specified**				
7.02.1.1	750 x 1000	12	No	$ 1,850.00	$ 22,200.00
8.00	**AGRICULTURAL DRAINS**				
8.01	100mm dia grade 1000 AG drain, screening backfill	770	Lm	$ 55.00	$ 42,350.00
8.02	SSD Pit/ flush out riser/ outlet	8	Item	$ 1,250.00	$ 10,000.00
9.00	**DELINEATION**				
9.01	**Signage**				
9.01.1	The supply and installation/relocation of directional and advisory traffic signage all inclusive and removal of all redundant signs as specified	1	Item	$ 4,500.00	$ 4,500.00
9.02	**Line marking**				
9.02.1	Installation of proposed line marking, including but not limited to lane division lines, directional arrows, bus lane surface treatment, stopping lines and RRPM's all inclusive				
9.02.2	Thermoplastic to VicRoads standards	1	Item	$ 5,000.00	$ 5,000.00
10.00	**LANDSCAPING/TOPSOILING & REINSTATEMENT**				
10.01	Topsoiling and seeding of nature strips, medians, batters, and all disturbed areas to a min. of 150mm min depth including regrading, cultivation throughout the duration of the works and the maintenance period	850	m^2	$ 50.00	$ 42,500.00
11.00	**MISCELLANEOUS**				
11.01	Public lights	10	No	$ 12,800.00	$ 128,000.00
11.02	Final clean-up, Including demobilisation and removal of temporary structures, etc.	1	Item	$ 4,500.00	$ 4,500.00
	Sub Total _Civil				*$ 1,209,870.00*
	Total				***$ 1,209,870.00***
	Total with 10% Project Management Fee				***$ 1,330,857.00***
	Total with 10% Project Management Fee + 30% contingency				***$ 1,730,114.10***

Please also note the following assumptions and exclusions

1. Design and documentation fees or authority fees, charges, levies and overview including insurances, bank guarantees.
2. Existing services relocations and facilitation including lowering or realignment thereof.
3. Protection of underground services during construction.
4. 30% contingency applied as order of magnitude estimate has been based on desktop study.
5. Asphalt resheet has been included for the approaches of the intersection only
6. Land acquisition
7. Price escalation is not included in the estimate
8. Excludes any allowance for abnormal weather conditions
9. No allowance has been made for night-works if required

The above opinion of probable costs should be considered current to the date of the document only. GTA Consultants cannot provide any form of assurance that the costings provided will not change due to changes in design and/or future costs of materials. The future outcome may vary, and this variation may be material.
This potential for variation should be considered in any circumstances where the costings are to be used for high level budgeting purposes, even in the short term.
Any party requiring detailed costing for quoting or construction purposes should seek a detailed cost estimate from a suitably qualified quantity surveyor.

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V106370: Wonthaggi North East PSP - Heslop Rd (from Fuller Rd to Korumburra-Wonthaggi Rd)					
Civil Construction					
Date	**7/02/2020**				
Basis of Estimate					
This cost estimate is based on google aerial map only (No Fuller Road and Wentworth Road intersections)					
	Heslop Rd (from Fuller Rd to Korumburra-Wonthaggi Rd)				
Item	**Description of works**	**Quantity**	**Unit**	**Rate**	**Amount**
1.00	**GENERAL**				
1.01	Site establishment	1	Item	$ 10,000.00	$ 10,000.00
1.02	Insurance	1	Item	$ 2,000.00	$ 2,000.00
1.03	Traffic Management and Control	70	Day	$ 500.00	$ 35,000.00
1.04	Supervision	1	Item	$ 12,000.00	$ 12,000.00
1.05	Surveying	1	Item	$ 12,000.00	$ 12,000.00
1.06	Sedimentation Control	1	Item	$ 6,000.00	$ 6,000.00
1.07	As Built Drawing preparation as per council and Vic Roads requirement	1	Item	$ 2,500.00	$ 2,500.00
2.00	**DEMOLITION, SITE PREPARATION AND RELOCATION ITEMS (Including removal from site)**				
2.01	Proving existing services	1	Item	$ 6,000.00	$ 6,000.00
2.02	Tree Removals	15	No	$ 160.00	$ 2,400.00
3.00	**BULK EARTHWORKS**				
3.01	Stripping and stockpiling of selected topsoil for reuse, excavation to proposed formation levels, including trimming, rolling, cutting and shaping, compaction of subgrades, removal and disposal of trees, shrubs, spoil, surplus unapproved soil, etc. This item is to incorporate the supply and placement of fill material as specified and directed including compaction to 98% modified compaction, as per AS1289, where specified.	1	Item	$ 200,000.00	$ 200,000.00
4.00	**PAVEMENTS, FLEXIBLE**				
	The supply and installation of the following compacted depth asphalt base and wearing courses including labour, materials, compaction and bituminous prime coat, to relevant specifications and as specified.				
4.01	**450mm Heavy duty pavement**				
4.01.1	Road pavements as specified and required	15400	m^2	$ 105.00	$ 1,617,000.00
4.01.2	Road shoulder pavement	4400	m^2	$ 45.00	$ 198,000.00
5.00	**DRAINAGE**				
5.01	**Drainage Pipes and Culverts**				
5.01.1	300mm dia RCP Class 2, RRJ	60	Lm	$ 250.00	$ 15,000.00
5.01.2	RCBC culvert (600 x 450)	50	Lm	$ 600.00	$ 30,000.00
5.02	**Drainage Pits**				
	Excavate for and construct concrete drainage structures including all materials, plant, labour, temporary covers, final pit lid and surround, step irons, forming, mixing, pouring, finishing and barricading all inclusive, unless otherwise defined.				
5.02.2	**Other**				
5.02.2.1	Culvert end walls	6	Item	$ 4,000.00	$ 24,000.00
6.00	**AGRICULTURAL DRAINS**				
6.01	100mm dia grade 1000 AG drain, screening backfill	100	Lm	$ 55.00	$ 5,500.00
6.02	SSD Pit/ flushout riser/ outlet	6	Item	$ 1,250.00	$ 7,500.00

7.00	**DELINEATION**				
7.01	**Signage**				
7.01.1	The supply and installation/relocation of directional and advisory traffic signage all inclusive and removal of all redundant signs as specified	1	Item	$ 3,000.00	$ 3,000.00
7.02	**Line marking**				
7.02.1	Installation of proposed line marking, including but not limited to lane division lines, directional arrows, bus lane surface treatment, stopping lines and RRPM's all inclusive				
7.02.2	Thermoplastic to VicRoads standards	1	Item	$ 4,000.00	$ 4,000.00
8.00	**LANDSCAPING/TOPSOILING & REINSTATEMENT**				
8.01	Topsoiling and seeding of nature strips, medians, batters, and all disturbed areas to a min. of 150mm min depth including regrading, cultivation throughout the duration of the works and the maintenance period	2300	m^2	$ 40.00	$ 92,000.00
9.00	**MISCELLANEOUS**				
9.01	Final clean-up, Including demobilisation and removal of temporary structures, etc.	1	Item	$ 8,000.00	$ 8,000.00
	Sub Total _Civil				*$ 2,291,900.00*
	Total				***$ 2,291,900.00***
	Total with 10% Project Management Fee				***$ 2,521,090.00***
	Total with 10% Project Management Fee + 30% contingency				***$ 3,277,417.00***

Please also note the followings assumptions and exclusions:

1. Design and documentation fees or authority fees, charges, levies and overview including insurances, bank guarantees.
2. Existing services relocations and facilitation including lowering or realignment thereof.
3. Protection of underground services during construction.
4. 30% contingency applied as order of magnitude estimate has been based on desktop study.
5. Land acquisition
6. Price escalation is not included in the estimate
7. Excludes any allowance for abnormal weather conditions
8. No allowance has been made for night-works if required
9. No Pedestrian or Shared path cost is included in this estimate

The above opinion of probable costs should be considered current to the date of the document only. GTA Consultants cannot provide any form of assurance that the costings provided will not change due to changes in design and/or future costs of materials. The future outcome may vary, and this variation may be material.

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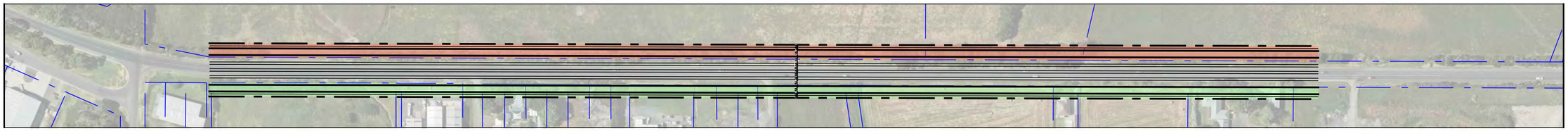
BASS HIGHWAY

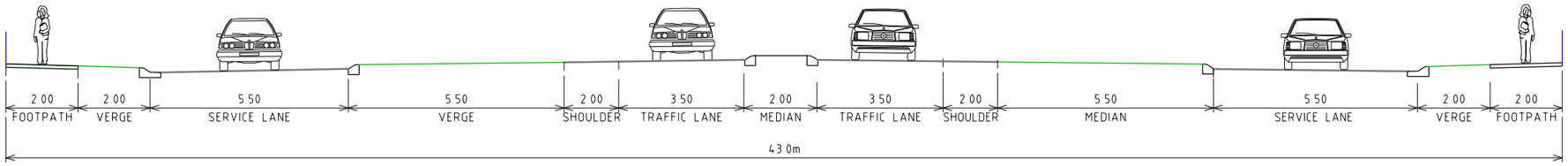
ROAD

BOULEVARD

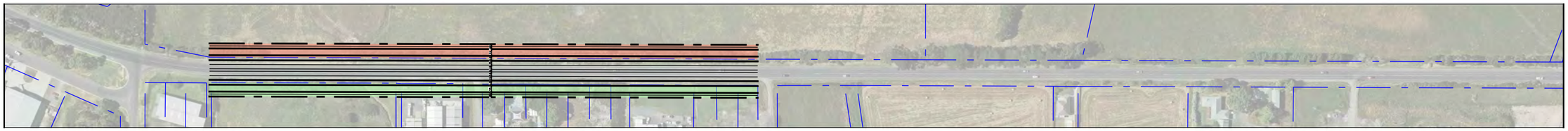


10,408 SQUARE METRES

9,412 SQUARE METRES

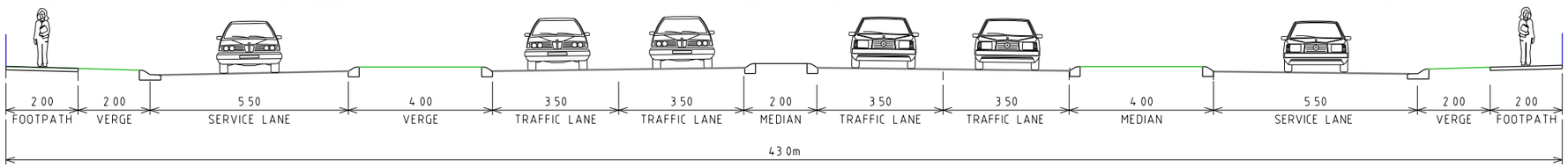


INITIAL CROSS-SECTION (WITH PROVISIONS FOR FUTURE CAPACITY IMPROVEMENTS) - 43.0m



5,202 SQUARE METRES

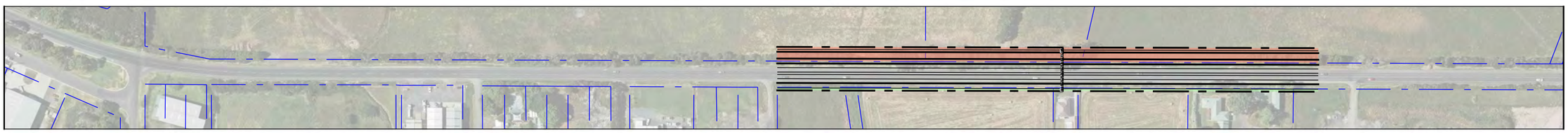
4,722 SQUARE METRES



ULTIMATE CROSS-SECTION (WEST OF JOHN STREET) - 43.0m

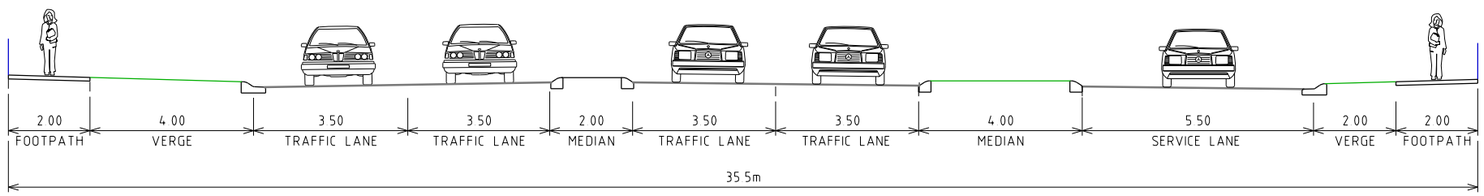
CARNEYS

ST CLAIR



5,203 SQUARE METRES

1,070 SQUARE METRES



ULTIMATE CROSS-SECTION (EAST OF JOHN STREET) - 35.5m

N

PLOTTED BY : brendan.klinko ON 31/01/2020 AT 12:57:09 PM

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PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

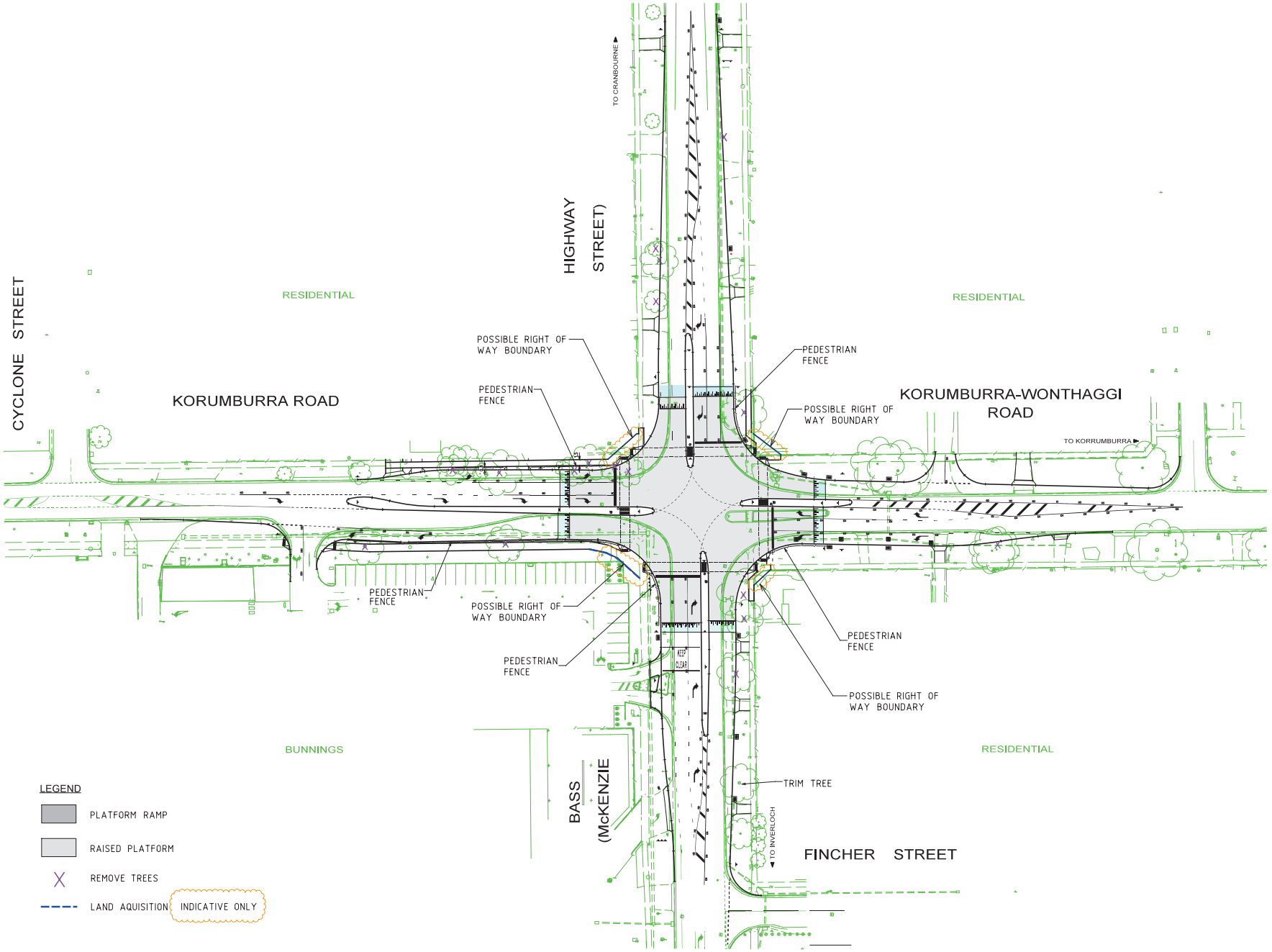
DESIGNED B.KLINKO
DESIGN CHECK -
APPROVED BY A. FARRAN
DATE ISSUED 31 JANUARY 2020

SCALE A3 0 X X N.T.S.
CAD FILE NO. V106372-03-P1.dgn

WONTHAGGI NORTH EAST PSP
BASS HIGHWAY ROAD WIDENING
CROSS-SECTIONS
CONCEPT LAYOUT

DRAWING NO. V106370-03-02 SHEET 02 OF 02 ISSUE P1

Non-PSP Intersections



RACV VICROADS MAP 713 R5
WONTHAGGI

TRAFFICWORKS PTY LTD
1st Floor 132 Upper Heidelberg Road IVANHOE VIC. 3079
P.O. Box 417 IVANHOE VIC. 3079
Tel (03) 9490 5900 Fax (03) 9490 5910 www.trafficworks.com.au

24/10/2016 3:00:10 PM BA698-P06-CIV-0302
I:\Y16 Projects\Y15750\3 Design_Requirements\BA698-COWTW\CAD\BA698-C01-CIV-0310.dgn
1:1000@ A3
P1

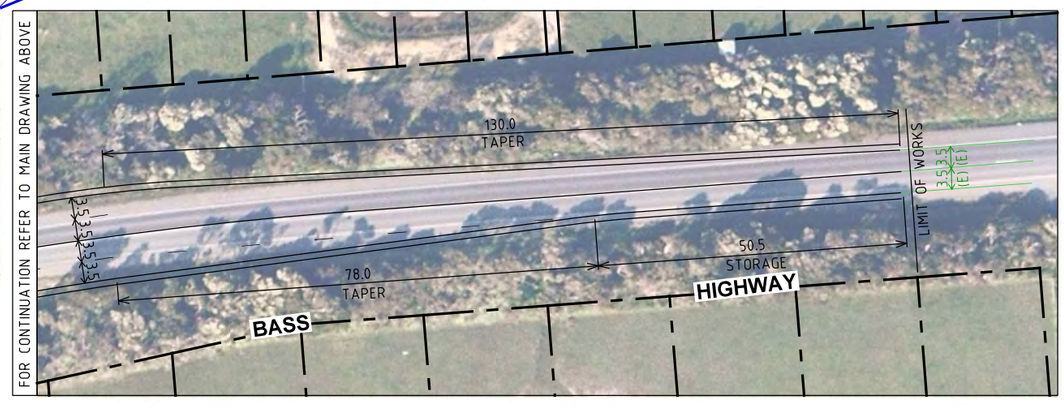
NOTES

DESIGN SPEED: 80KM/H
POSTED SPEED: 80KM/H
DESIGN VEHICLE: 19.0m SEMI TRAILER
CHECK VEHICLE: 26.0m B-DOUBLE

FOR CONTINUATION REFER TO MAIN DRAWING BELOW

FOR CONTINUATION REFER TO INSET A

FOR CONTINUATION REFER TO INSET B



FOR CONTINUATION REFER TO MAIN DRAWING ABOVE

N

PLOTTED BY : hakan.girgin ON 1/08/2017 AT 5:22:35 PM

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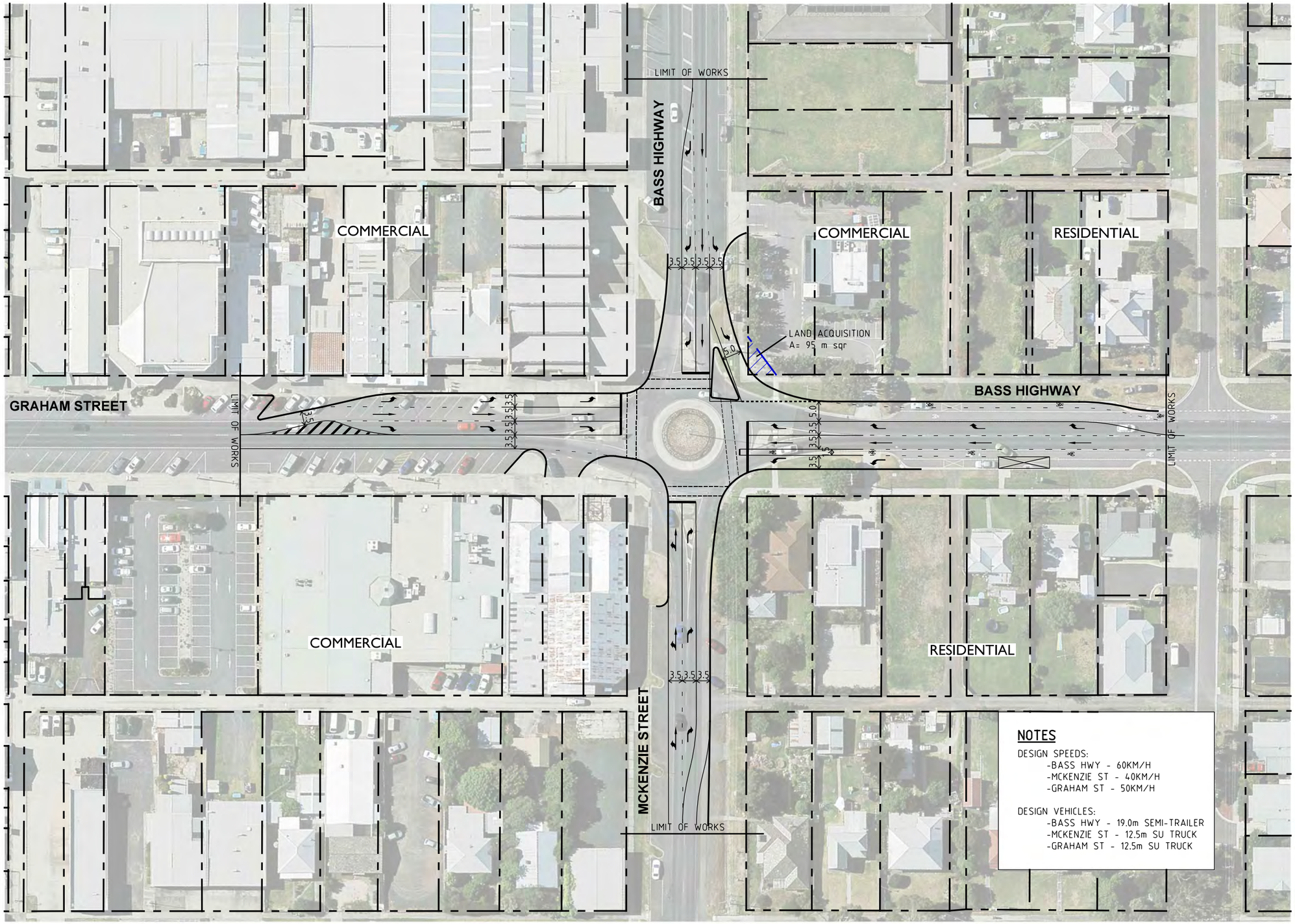
PRELIMINARY PLAN
FOR DISCUSSION PURPOSES
ONLY SUBJECT TO CHANGE
WITHOUT NOTIFICATION

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

DESIGNED	J.MAURO
DESIGN CHECK	-
APPROVED BY	H.GIRGIN
DATE ISSUED	19 APRIL 2017
CAD FILE NO.	V106370-SK08-P1.dgn
SCALE	A3 — 0 10 20 — 1:1000

WONTHAGGI NORTH EAST PSP
BASS HIGHWAY / HESLOP ROAD INTERSECTION 9
CONCEPT LAYOUT

DRAWING NO. V106370-SK08 ISSUE P1



PLOTTED BY : hakan.girgin ON 1/08/2017 AT 5:28:37 PM

GTA consultants
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DESIGNED A. WHALE
DESIGN CHECK H. GIRGIN
APPROVED BY H. GIRGIN
DATE ISSUED 21 APRIL 2017

SCALE A3 0 5 10 1:1000
CAD FILE NO. V106370-SK09-P1.dgn

WONTHAGGI NORTH EAST PSP
BASS HIGHWAY/ GRAHAM STREET / MCKENZIE STREET INTERSECTION 7
CONCEPT LAYOUT
DRAWING NO. V106370-SK09 ISSUE P1