



St Germain Special Activity Precinct
1425 Pound Road &
2100 Thompsons Road
Clyde North
Transport Impact Assessment

transportation planning, design and delivery

St Germain Special Activity Precinct
1425 Pound Road & 2100 Thompsons Road,
Clyde North
Transport Impact Assessment

Issue: A 03/10/13

Client: Beveridge Williams
Reference: 13M2191000
GTA Consultants Office: VIC

Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
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1. Introduction

1.1 Background & Proposal

A 96A application has been lodged with the Growth Areas Authority (GAA) for a proposed Special Activity Centre incorporating a large medical facility on land located at 2100 Thompsons Road and 1425 Pound Road in Clyde North. The subject site is a key site within the yet to be finalised Thompsons Road Precinct Structure Plan (PSP #1053) and the wider Clyde North Growth Area.

GTA Consultants was commissioned by the Applicant in June 2013 to undertake a transport impact assessment of the proposed development.

The proposal includes the construction of a Special Activity Centre incorporating a large range of uses across several areas as summarised in Table 1.1. For the purposes of clarity, the proposed development has been split into five precincts as shown in Table 1.1 and shown diagrammatically in Appendix A. Four of the precincts (excluding the retirement village) surround a town square, which is the focus of the proposed St Germain Village. The wider superblock is to be constructed in a staged manner over the next 30 years. The focus of this report is Stage 1, noting that an assessment of car parking supply has been completed for future stages in their current format and where statutory rates are available.

Table 1.1: Development Schedule

Description	Stage	Use	Size
Medical Precinct (Lot A)	Stage 1	Medical	7,850 m ²
		Pharmacy	350 m ²
North-East Precinct (Lot B)	Stage 1	Supermarket	4,000 m ²
		Retail / speciality shops / café	1,840 m ²
	Future stage	Mini major	1,550 m ²
		Retail / speciality shops	140 m ²
		Restaurant	450 m ²
		Tavern	750 m ²
South East Precinct (Lot C)	Stage 1	Retail / café	760 m ²
		Apartments	34 x 2 bedroom + 2 x Penthouses
	Future stage	Community Activity Centre	1,000 m ²
		Gymnasium	1,000 m ²
		Child care	120 children
South West Precinct (Lot D)	Stage 1	Office	1,770 m ²
		Retail	240 m ²
	Future stage	SOHOs [1]	7
		Townhouses	6
Retirement Village (Lot E)	Stage 1	Retirement Village	210 x 1-2 bedroom dwellings 34 x 3 bedroom dwellings 16 x 1-2 bedroom apartments

[1] SOHO = Small Office Home Office

It is proposed to provide bicycle parking spaces and associated facilities across the site in excess of the statutory requirements.

Pedestrian paths have been provided across the subject site to link the precincts surrounding the town square together. Paths will be provided on both sides of the internal roadways providing key links between the four precincts within St Germain Village. The proposed St Germain Village east-west Main Street has been designed to cater for pedestrians with no less than four crossing points proposed close to the town square.

Designated loading areas are provided for the medical centre, the supermarket and the mini major tenancy (part of the future stages). Access into these loading areas is provided via the internal road network which provides access to the future north-south road (known as Bells Road) and Thompsons Road. In most cases loading vehicles have been provided with a route to the required loading dock which does not involve using the east-west Main Street.

It is proposed to provide a total of 1,364 car parking spaces (including 23 disabled spaces) across the five precincts to service the various Stage 1 land uses. Some 70 communal spaces are to be provided throughout the retirement village in addition to the car parking on each individual lot (up to two spaces per dwelling). The car parking spaces are to be provided across the precincts as shown Table 1.2.

Table 1.2: Car Parking Provision – standard spaces (disabled spaces)

Precinct	Stage 1 (spaces)	Future Stage (spaces)
Medical Precinct (Lot A)	580 (10 disabled)	N/A
North-East Precinct (Lot B)	260 (4 disabled)	126
South East Precinct (Lot C)	36 (1 disabled)	97 (5 disabled)
South West Precinct (Lot D)	77	[2]
St Germain Village – on-street	63	N/A
Retirement village (Lot E)	70 + 278[1]	N/A
Total	1,364	223

[1] Up to two spaces (one garaged space) provided on each individual plot for retirement village dwellings. Assume two spaces (one garaged space) are provided for three bedroom dwellings.

The St Germain precinct is situated approximately 2.5 kilometres to the east of Cranbourne-Berwick Road (the eastern edge of the Cranbourne East residential area). Subject to the appropriate approvals the St Germain precinct will be delivered in advance of other land parcels within the Thompsons Road PSP area. As a consequence the Applicant proposes to extend Thompsons Road to connect with the subject site and therefore provide a direct connection to the surrounding arterial road network. This will form the interim access arrangement.

1.1.1 Interim Access Arrangements

The interim access arrangements will involve an extended Thompsons Road to the eastern edge of the St Germain Village. A further link will be provided which involves the construction of a length of the future north-south road to be known as Bells Road. Bells Road will provide a left in / left out to the Medical Precinct and a direct link to the western end of the east-west Main Street.

The interim access framework for the proposal is as follows:

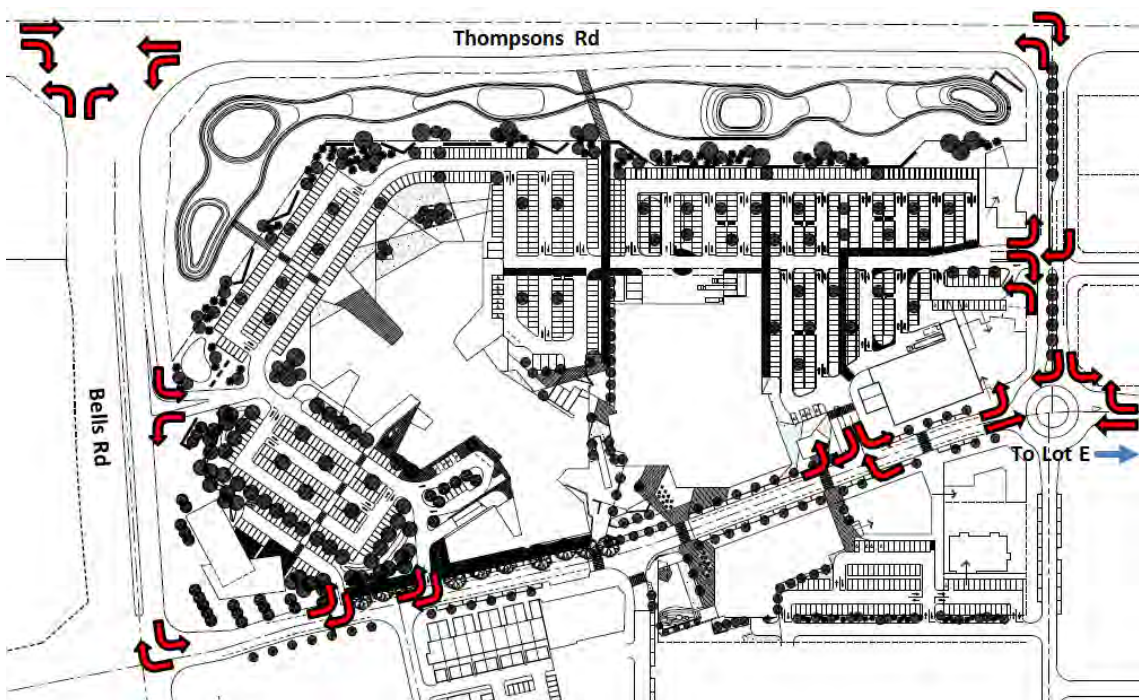
- Bells Road / Thompsons Road – unsignalised T-intersection
- Thompsons Road midblock between Soldiers Road (existing) and Bells Road – left in / left out
- Bells Road left in / left out south of Thompsons Road
- Bells Road connecting with the proposed east-west Bells Road.

Figure 1.1 and Figure 1.2 have been prepared to outline the interim access arrangement to service the initial stages of the development.

Figure 1.1: Interim Access Strategy



Figure 1.2: Proposed St Germain Village Interim Access Arrangements



1.1.2 Ultimate Access Arrangements

The higher order anticipated ultimate access framework for the proposal is as follows:

- Bells Road / Thompsons Road – signalised intersection
- Midblock on Thompsons Road between Soldiers Road (existing) and Bells Road – left in / left out
- Thompsons Road east of the proposed left in / left out – service road arrangement.
- Bells Road left in / left out between Thompsons Road and proposed east-west Main Street
- Bells Road / proposed east-west Main Street – signalised intersection.

1.2 Subject Site

The subject site is located in Clyde North and is part of a large triangular block of land bound in part by Pounds Road and Thompsons Road. The site has frontages of approximately 900m to Thompsons Road and 320m to Bells Road (a future road, which will connect with the existing Pound Road to the south). In the medium term (10 to 20 years) it is anticipated that Thompsons Road and Bells Road will be designated primary arterial roads and will be located within a Road Zone 1.

The site is located within an Urban Growth Zone and is currently occupied by farmland.

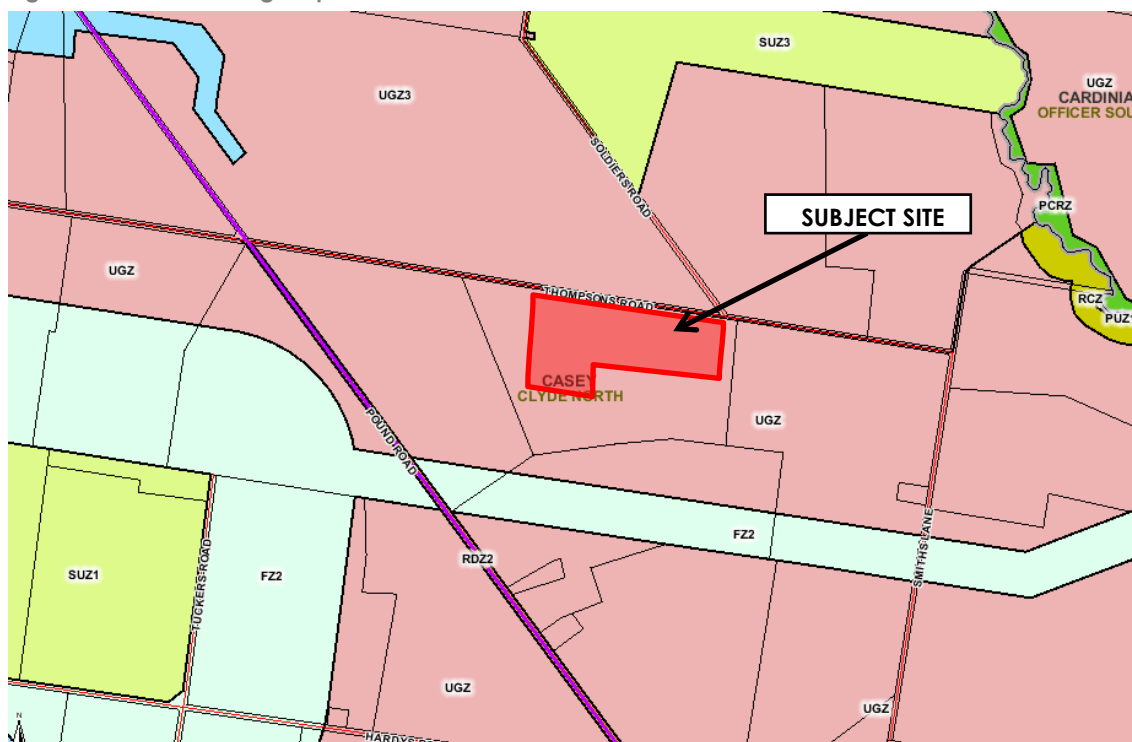
The surrounding properties include a mix of rural land uses. The eastern edge of the Cranbourne East residential area is approximately 2.5km west of the subject site.

The location of the subject site and the surrounding environs is shown in Figure 1.3, and the land zoning across the area is shown in Figure 1.4.

Figure 1.3: Subject Site and its Environs



Figure 1.4: Land Zoning Map



(Reproduced from Land Channel web site)

Further details regarding the subject site and the surrounding road network are provided in Appendix B.

1.3 Purpose of this Report

The report sets out an assessment of the anticipated parking, traffic and transport implications of stage 1 of the proposed development, including consideration of:

- the adequacy of the proposed pedestrian, bicycle and public transport access arrangements to the site
- the adequacy of the proposed bicycle parking arrangements in terms of supply (quantum) and layout
- the adequacy of the proposed car parking provision
- the adequacy of the proposed car park layout
- the adequacy of the proposed arrangements for loading and waste collection
- the acceptability of the broad traffic impacts of the proposed development, including the need for mitigating road works and appropriate vehicular access.

1.4 References

In preparing this report, a number of references have been made, including:

- plans for the proposed development prepared by Clarke Hopkins Clarke, plan no 1353/TP01, dated 6 August 2013
- Casey Planning Scheme
- Australian Standard / New Zealand Standard, Parking Facilities (AS2890)

- Vic Roads Access Management Policies May 2006 Version 1.02 (Guidelines to Transport Impact Assessment Reports for major land use and development proposals)
- traffic surveys undertaken by GTA Consultants as referenced in the context of this report
- other documents as nominated.

2. Transport Policy

2.1 Strategic Context

There are a number of key State Government policy documents applicable to the subject land, which provide guidance on appropriate land use and development. Those that are relevant in the context of transport planning are as follows:

- Clause 18 of the Casey Planning Scheme
- Melbourne 2030 and Melbourne@5million
- Victorian Transport Plan
- SmartRoads Policy
- Transport Integration Act (2010).

These documents are discussed in more detail in Appendix C with a brief outline provided below.

2.2 Clause 18 (Casey 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.
- Encourage higher land use densities and mixed use developments near railway stations, major bus terminals, transport interchanges, tramways and principal bus routes.
- Pedestrian and cyclists access to public transport should be facilitated and safeguarded.
- 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.

2.3 Transport Policy Discussion

Encouraging the use of public transport and walking and cycling as modes of transport is central to achieving the above objectives.

Based on discussions with the GAA the site will ultimately be serviced by public transport and all parts of the development are within walking distance of the proposed neighbourhood activity centre (the St Germain Village). There are on-road cycle lanes proposed along the internal local roads. End of trip cycle facilities are to be provided and it is expected that the site will be connected to the principal bicycle route once if it is extended to the area.

The proposed development as it is ultimately proposed presents an opportunity to promote the vision of this objective by encouraging the use of public transport, cycling, and walking and not encourage an over use of motor vehicles.

3. Sustainable Transport Considerations

3.1 Walking & Cycling Network

The proposed development is to be developed within a predominantly rural area, which does not currently provide a walking and cycling network. With this in mind the precinct has been designed to provide flexibility in terms of its connections with the ultimate walking and cycling network, which is still to be confirmed. The Thompsons Road PSP will provide some guidance with respect to the road hierarchy and hence the walking and cycling network. The project team have been working closely with the GAA to ensure that the configuration of the proposed walking and cycling network can link in with the networks set out within the PSP.

3.2 Public Transport

Subject to bus planning by Public Transport Victoria (PTV) it is expected that the proposed development will be serviced by bus routes along Bells Road, Thompsons Road and potential a local route running through the development. The internal roads have been designed to accommodate buses and areas have been provided for bus stops within the St Germain Village.

3.3 Bicycle Parking & Associated Facilities

3.3.1 Overview

In addition to Clause 18 as discussed above, Clause 52.34 of the Casey Planning Scheme seeks to encourage cycling as a mode of travel through the provision of appropriate bicycle parking and associated facilities. The discussion and analysis presented below examines these requirements.

3.3.2 Statutory Requirements

Bicycle Parking Provision

The statutory requirements for the provision of bicycle facilities for the development proposal are set out in Table 3.1.

Table 3.1: Statutory Requirement for Bicycle Facilities

Area	Use	Size	Statutory Rate		Statutory Requirement	
			Employee/ Resident	Visitor	Employee / Resident	Visitor
Medical Precinct Stage 1	Medical	60 Practitioners	1 space per 8 practitioners	1 space per 4 practitioners	8 spaces	15 spaces
	Pharmacy	350 m ²	NS	NS	-	-
North-East Precinct Stage 1	Supermarket	4,000 m ²	NS	NS	-	-
	Retail/ Specialty Shops/ Café	1,840 m ²	1 space per 300 m ²	1 space per 500 m ²	6 spaces	4 spaces
North-East Precinct Future Stage	Mini Major	1,550 m ²	NS	NS	-	-
	Retail/ Specialty Shops	140 m ²	1 space per 300 m ²	1 space per 500 m ²	0 spaces	0 spaces
	Restaurant	450 m ²	1 space per 100 m ²	2 plus 1 space per 200 m ² if NFA exceeds 400 m ²	5 spaces	4 spaces
	Tavern	750 m ²	NS	NS	-	-
South-East Precinct Stage 1	Apartments	34 dwellings	1 space per 4 dwellings	1 space per 10 dwellings	9 spaces	3 spaces
	Retail	760 m ²	1 space per 300 m ²	1 space per 500 m ²	3 spaces	2 spaces
South-East Precinct Future Stage	Community Activity Centre	1,000 m ²	1 space per 1,500 m ²	2 plus 1 space per 1,500 m ²	1 space	3 spaces
	Gym	1,000 m ²	NS	NS	-	-
	Child Care Centre	120 m ²	NS	NS	-	-
South-West Precinct Stage 1	Offices	1,770 m ²	1 space per 300 m ² if NFA exceeds 1,000 m ²	1 space per 1,000 m ² if NFA exceeds 1,000 m ²	6 spaces	2 spaces
	Wine Bar	240 m ²	NS	NS	-	-
South-West Precinct Future Stage	SOHOs	8 tenancies	NS	NS	-	-
	Townhouses	6 dwellings	NA	NA	-	-
Retirement Village Stage 1	Retirement Village	270 dwellings	N/A	N/A	-	-
Total					36 spaces	33 spaces

Table 3.1 indicates that the proposal has a statutory bicycle parking requirement of 69 bicycle spaces, including 36 employee resident spaces and 33 visitor spaces.

Adequate space to accommodate the required supply of bicycle parking has been provided for the office and apartment component of the development.

Employee Cycle Parking

It is recommended that a bank of secure cycle parking is provided within the medical precinct and at a central location for the other three precincts. A consolidated secure facility with associated facilities will encourage bicycle travel. GTA recommends at least 8-10 employee spaces per facility are provided.

Visitor Cycle Parking

It is recommended that additional on-street visitor bicycle parking is provided for visitors to the area with at least 15 of these visitor spaces located within the medical precinct and 5 visitor

spaces in or around each of the other three precincts at appropriate locations with good lighting and natural surveillance.

Associated Facilities

In addition to the requirement for bicycle parking, Clause 52.34-3 of the Casey Planning Scheme requires 1 shower for the first 5 employee bicycle parking spaces and 1 shower for each subsequent 10 employee bicycle parking spaces (if 5 or more employee bicycle parking spaces are required).

Application of the above rates to the statutory employee bicycle parking requirement of up to 12 bicycle spaces per precinct indicates that the proposal has a statutory requirement of one change rooms/showers precincts. It is recommended that the shower facilities are consolidated and co-located with the two banks of secure employee cycling parking spaces.

3.3.3 Adequacy of Bicycle Parking/Facilities Provision

On the basis of the discussions and analysis presented above, the development should include on-site bicycle parking for at least 69 bicycle parking spaces and two sets of change rooms/shower facilities to encourage cycling as a mode of travel to the site (as per the objective of Clause 52.34).

3.3.4 Bicycle Parking Layout & Access

The proposed bicycle parking layout has yet to be detailed. Space exists within the office and apartment components of the development to provide the required number of bicycle spaces and ample space exists across the four precincts to cater for both employee and visitor cycle parking and associated facilities.

4. Car Parking Provision

4.1 Statutory Car Parking Requirements

Statutory requirements for the provision of car parking are set out in Clause 52.06 of the Casey Planning Scheme, with parking rates specified in Table 1 to Clause 52.06-5. An assessment of the statutory parking requirements for the development proposal is set out in Table 4.1.

Table 4.1: Statutory Car Parking Requirements

Description	Stage	Use	Size	Statutory Parking Rate	Statutory Parking Requirement
Medical Precinct	Stage 1	Medical	7,850 m ² 60 practitioners [1]	3 spaces per person providing health services [2]	182 spaces
		Pharmacy (Shop)	350 m ²	4 spaces per 100 m ² of leasable floor area	14 spaces
North Precinct	Stage 1	Supermarket	4,000 m ²	5 spaces per 100 m ² of leasable floor area	200 spaces
		Retail / speciality shops / café	1,840 m ²	4 spaces per 100 m ² of leasable floor area	73 spaces
	Future	Mini major	1,550 m ²	4 spaces per 100 m ² of leasable floor area	62 spaces
		Retail / speciality shops	140 m ²	4 spaces per 100 m ² of leasable floor area	5 spaces
		Restaurant	450 m ² (150 patrons) [3]	0.4 spaces per patron	60 spaces
		Tavern	750 m ² (200 patrons) [3]	0.4 spaces per patron	80 spaces
South East Precinct	Stage 1	Retail / café	760 m ²	4 spaces per 100 m ² of leasable floor area	30 spaces
		Apartments	34 x 2 bedroom + 2 x Penthouses [4]	1 space per one or two bedroom dwelling [4]	45 spaces
	Future	Community Activity Centre	1,000 m ²	Not specified (NS)	-
		Gymnasium	1,000 m ²	Not specified (NS)	-
		Child care	120 children	0.22 spaces per child	26 spaces
South West Precinct	Stage 1	Office	1,770 m ²	3.5 spaces per 100 m ² of net floor area)	61 spaces
		Retail	240 m ²	4 spaces per 100 m ² of leasable floor area	9 spaces
	Future	SOHOs [5]	7	Not specified (NS)	-
		Townhouses	6	1 space per one or two bedroom dwelling	7 spaces
Retirement Village	Stage 1	Retirement Village	226x 1-2 bedroom 34 x 3 bedroom	1 space per one or two bedroom dwelling [4]	346 spaces
Stage 1					960 spaces
Future stages					240 spaces
Total					1,200 spaces

[1] Estimated number of practitioners based on the provided building layout [2] 5 spaces for the first practitioner [3] Assuming 1 patron per 3 m² [4] Noting 2 spaces per three+ bedroom dwelling and 1 visitor space per five dwellings. [5] SOHO = Small Office Home Office

The above assessment anticipates that the Stage 1 development proposal has statutory requirement of 960 spaces.

In this instance, the proposed on-site parking provision of 1,364 car spaces as part of the Stage 1 development exceeds the statutory parking requirement.

In addition to the above, it is noted that the statutory car parking requirement for the overall development is 1,200 spaces, for those uses where a parking rate is nominated in the Scheme.

In this regard, the scheme does not specifically incorporate a recommended parking rate for the community activity centre, gymnasium and SOHO land uses. In such circumstances, the scheme notes:

"Where a use is not specified in Table 1 or ... another provision of the planning scheme or in a schedule to the Parking Overlay ... car parking spaces must be provided to the satisfaction of the responsible authority."

It is recommended that the provision of car parking for the future stages of development are considered when further detail is available surrounding the particular land uses are available.

Building Code of Australia (BCA) Requirement

In this instance, an empirical assessment is expected to accompany any subsequent planning applications to set out the likely car parking demand across the site and as a consequence provide commentary on the adequacy of the car parking provision.

In addition to the statutory car parking requirements in the Planning Scheme, the Building Code of Australia (BCA) outlines requirements for the provision of car parking for people with disabilities. An assessment of the BCA disabled car parking requirements for the development proposal is set out in Table 4.2.

Table 4.2: BCA Car Parking Requirements for People with Disabilities

Description	BCA Class	BCA Disabled Parking Requirement
Apartments	Class 2	None
Office	Class 5	1 space for every 100 car parking spaces or part thereof
Retail	Class 6	1 space for every 100 car parking spaces or part thereof
Clinic or day surgery	Class 9A	1 space for every 100 car parking spaces or part thereof

Table 4.2 shows that the required rate for disabled spaces does not exceed 1 space per 100 for office, retail or Clinic/Day Surgery land uses. Therefore, using a conservative approach and adopting this rate to all allocated spaces within the development generates a requirement for 12 disabled parking spaces.

As stated in Section 1.1 of this report, it is proposed to provide a total of 23 disabled car parking spaces across the four precincts, exceeding the BCA requirement.

4.2 Adequacy of Parking Provision

Table 4.3 has been prepared to summarise the statutory car parking requirement and provision by precinct.

Table 4.3: Car Parking Demand Versus Provision

Stage	Precinct	Statutory Requirement	Supply
1	Medical	196	580
	North-East	273	260
	South-West	70	77
	South-East	75	36
	On-street	-	63
	Retirement village	346	348
	Total	960	1,364
Future	Medical	N/A	N/A
	North-East	207	126
	South-West	7	N/A
	South-East	26	97
	Retirement village	N/A	N/A
	Total	240	223
Overall	Medical	196	580
	North-East	480	386
	South-West	77	77
	South-East	101	133
	On-street	-	63
	Retirement village	346	348
	Total	1,200	1,587

The above summary table indicates that the St Germain Village neighbourhood activity centre and associated medical precinct will provide a car parking provision which exceeds the statutory car parking requirement for Stage 1 of the development, with approximately 400 car spaces in surplus.

5. Car Parking Layout

The proposed parking layout has been assessed in respect to the relevant Design Standards set out in Clause 52.06 of the Planning Scheme. A summary of compliance is set out below.

Design Standard 1: Accessways

- Complies.

Design Standard 2: Car Parking Spaces

- Complies.

Design Standard 3: Gradients

- The gradient of the ramp to the basement car parking area within the medical precinct will be required to be designed in accordance with the Casey Planning Scheme and/or the Australian Standard (AS2890).

Design Standard 4: Mechanical Parking

- Not applicable.

Design Standard 5: Urban Design

- Urban design is outside the scope of this report.

Design Standard 6: Safety

- Lighting and signage is not shown but should be incorporated at the detailed design stage.

Design Standard 7: Landscaping

- Landscaping is outside the scope of this report.

6. Loading & Waste Collection

6.1 Statutory Requirements

Clause 52.07 of the Casey Planning Scheme is applicable where buildings or works are constructed for the manufacture, servicing, storage or sale of goods or materials.

The Clause anticipates the development proposal has a statutory requirement for loading as follows:

- North-east precinct:
 - Stage 1: Supermarket (5,000sqm) – 63.4sqm
 - Future stage: Mini-major (1,550sqm) – 27.4sqm.

Loading zones are provided across the site as follows:

- Medical precinct – loading zone for 2 x 8.8m waste vehicles and 1 x 12.5m truck.
- North-east precinct
 - Stage 1: supermarket (5,000sqm) – Loading zone for 1 x 19.0m articulated truck, 1 x 12.5m truck and 3 x 8.8 delivery / waste vehicles
 - Future stage: mini major (1,550sqm) – Loading zone for 19.0m articulated truck.

In this instance, the statutory loading requirements are met by the proposed loading facilities.

6.2 Layout

The proposed loading areas have been designed to exceed Planning Scheme requirements and are accessible by vehicles including 19.0m semi-trailer (depending on the loading zone) as confirmed using AutoTURN (a computer package designed to simulate vehicle swept paths in a CAD environment). The results of this swept path assessment are shown in Appendix D.

6.3 Refuse Collection

The development incorporates seven dedicated areas for bin storage as presented within the waste management plan included within the Clarke Hopkins Clarke drawing pack.

7. Traffic Impact

7.1 Performance Objectives

Under the Vic Roads TIAR Guidelines, the proposed development is considered to be a 'Major Development'. Therefore, the transport performance objectives of the proposed development should ensure that:

- For new access arrangements direct to a site – provision is made for all access arrangements to operate safely and efficiently into the future (at least 10 years after full development).
- For existing road infrastructure – any potential adverse effects from land use development proposals on road safety and operational efficiency are identified and, where necessary, developers provide mitigating road improvement works as part of the development costs to minimise these effects and retain, within practical limitations, the level of safety and operational efficiency that would have existed without the development.

7.2 Development Overview

7.2.1 Proposed Development (Stage 1)

As discussed in Section 1 of this report, Stage 1 proposes to develop the land uses set out in Table 7.1, with additional land uses to be included as part of future stages. For the purposes of this analysis Stage 1 is considered as the "full development" as outlined above in Section 7.1.

Table 7.1: Stage 1 Land Uses

Precincts	Land Uses	Size
Medical Precinct (Lot A)	Medical	7,850 m ²
	Pharmacy	350 m ²
North-East Precinct (Lot B)	Supermarket	4,000 m ²
	Retail / speciality shops / café	1,840 m ²
South East Precinct (Lot C)	Retail / café	760 m ²
	Apartments	34 x 2 bedroom + 2 x Penthouses
South West Precinct (Lot D)	Office	1,770 m ²
	Retail	240 m ²
Retirement Village (Lot E)	Retirement Village	210 x 1-2 bedroom 34 x 3 bedroom 16 x 1-2 bedroom apartments

The following analysis has been prepared to consider the likely impact of the 'Stage 1' development under the 'interim' 10 year future period with subsequent stages of the development to be assessed, as and when required.

As outlined in Section 1.1.1, a section of Thompsons Road will be constructed to provide a link from Stage 1 of the development to the Berwick-Cranbourne Road and Thompsons Road intersection. It is noted that the detailed road layout is yet to be confirmed, but the subsequent analysis has been prepared to inform the general level of required infrastructure. Figure 7.1 shows the proposed interim road network connecting the subject site to the surrounding road network.

Figure 7.1: Interim Road Network Arrangements



7.2.2 Overall Development (Future Stages)

The subject site is ultimately proposed to incorporate additional land uses in keeping with those already proposed as part of the special activity centre. The quantum and location of these uses have yet to be defined and are therefore not considered as part of this report.

7.3 Traffic Generation

As detailed in Appendix E, Stage 1 of the development is expected to generate in the order of 500 and 1,050 vehicles per hour during the AM and PM peak hour respectively, and up to 12,000 vehicles per day.

7.4 Traffic Distribution and Assignment

The directional distribution and assignment of traffic generated by Stage 1 of the proposed development will be influenced by a number of factors, including the following:

- i configuration of the arterial road network in the immediate vicinity of the site
- ii configuration of the proposed new roads (Thompsons Road extension)
- iii existing operation of intersections providing access between the local and arterial road network
- iv configuration of the access points to the site.

For the purposes of this assessment, as outlined in Section 7.2.1, that in the interim period the proposed development will be accessed via Thompsons Road only. The following directional distributions of the site generated traffic have therefore been adopted at the intersection of Berwick-Cranbourne Road and Thompsons Road:

- Thompsons Road west 20%
- Berwick-Cranbourne Road north 50%
- Berwick-Cranbourne Road south 30%.

In addition, the directional split of traffic (i.e. the ratio between the inbound and outbound traffic movements) are further distributed in accordance with the estimated in/out splits anticipated for each land use. The directional split of traffic is detailed in Appendix E.

Based on the above, Figure 7.2 and Figure 7.3 have been prepared to show the estimated increase in turning movements as a result of the development in the vicinity of the site following the completion of Stage 1 at the intersection of Berwick-Cranbourne Road and Thompsons Road.

Figure 7.2: AM Peak Hour Site Generated Traffic Volumes

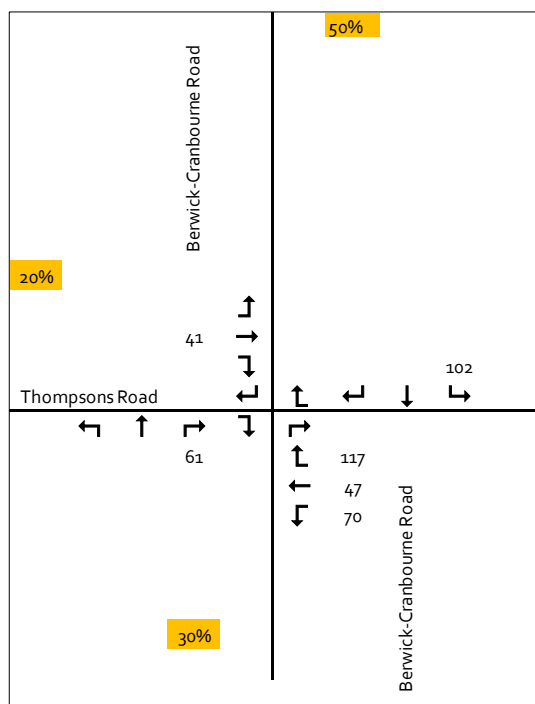
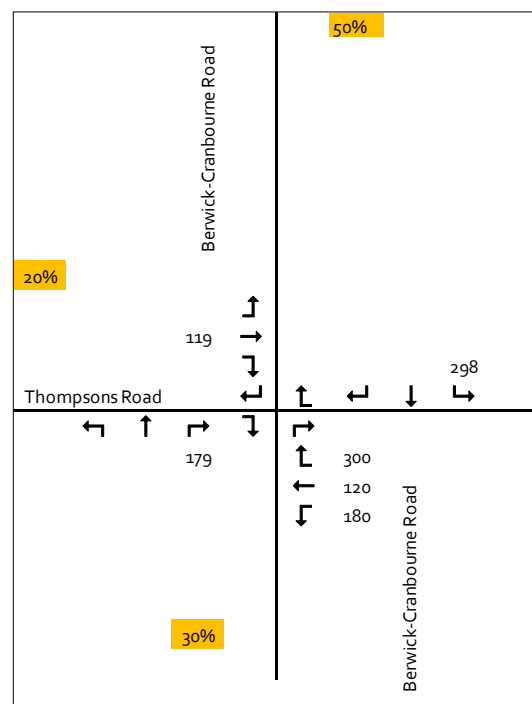


Figure 7.3: PM Peak Hour Site Generated Traffic Volumes



7.5 Traffic Impact

7.5.1 Overview

In accordance with Vic Roads TIAR Guidelines for existing road infrastructure, the following section assesses the operation of the Berwick-Cranbourne Road / Thompsons Road intersection to determine whether any mitigating road improvement works will be required to retain, within practical limitations, the level of safety and operational efficiency that would have existed without the proposed development.

For new site access points, in this case those connecting the subject site with Thompsons Road, an assessment has been completed under 'post development' conditions (existing conditions with traffic growth and Stage 1 development).

Notwithstanding the above, and having regard to the lack of available traffic growth data and road configurations of the future arterial road network in the vicinity of the site, typical growth rates have been adopted in this instance. For the purposes of this assessment a 3% per annum linear growth rate has been applied to Thompsons Road. It is noted that whilst in other growth corridors strategic modelling exists (which provides guidance on future levels of traffic growth), in this instance a model which has been approved by the Department of Planning, Transport and Local Industry (DPTLI) is not available for use.

7.5.2 Existing Conditions

GTA Consultants undertook traffic movement counts at the intersection of Berwick-Cranbourne Road / Thompsons Road during the following peak periods:

- Friday 13 September 2013 AM Peak 8:00am - 9:00am
- Thursday 12 September 2013 PM Peak 5:00pm - 6:00pm.

The AM and PM peak hour traffic volumes are shown in Figure 7.4 and Figure 7.5, respectively.

Figure 7.4: Existing AM Peak Hour Traffic Volumes

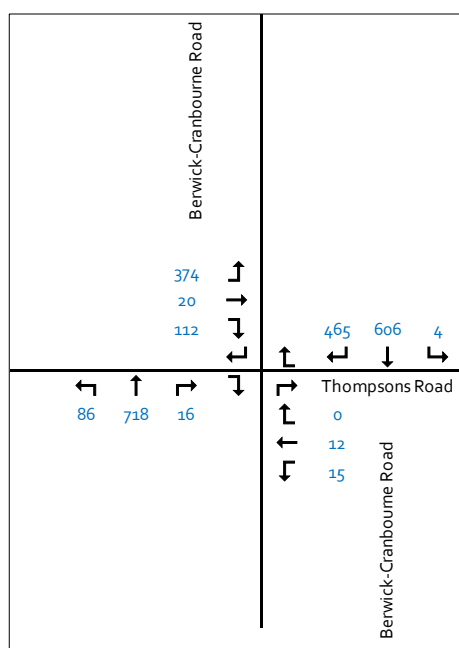
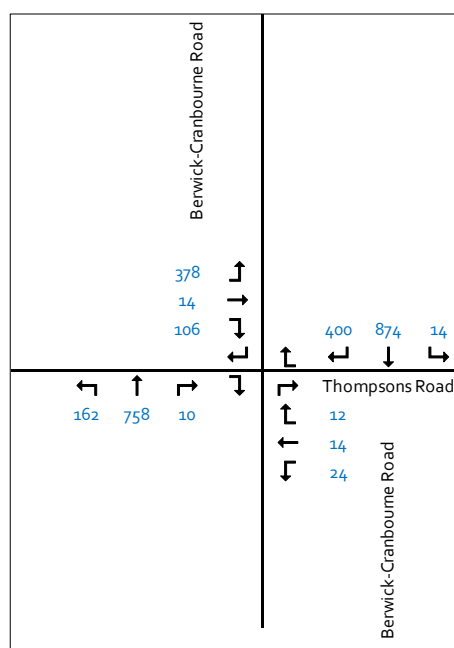


Figure 7.5: Existing PM Peak Hour Traffic Volumes



The operation of the intersection of Berwick-Cranbourne Road/Thompsons Road has been assessed using *SIDRA INTERSECTION*¹ software, 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 unsignalised intersections, a DOS of around 0.90 has been

¹ Program used under license from Akcelik & Associates Pty Ltd.

typically considered the 'ideal' limit, beyond which queues and delays increase disproportionately².

Figure 7.6 and Table 7.2 presents a summary of the existing configuration and operation of the intersection, with full results presented in Appendix F of this report.

Figure 7.6: Berwick-Cranbourne Road / Thompsons Road – Existing Unsignalised Intersection Configuration

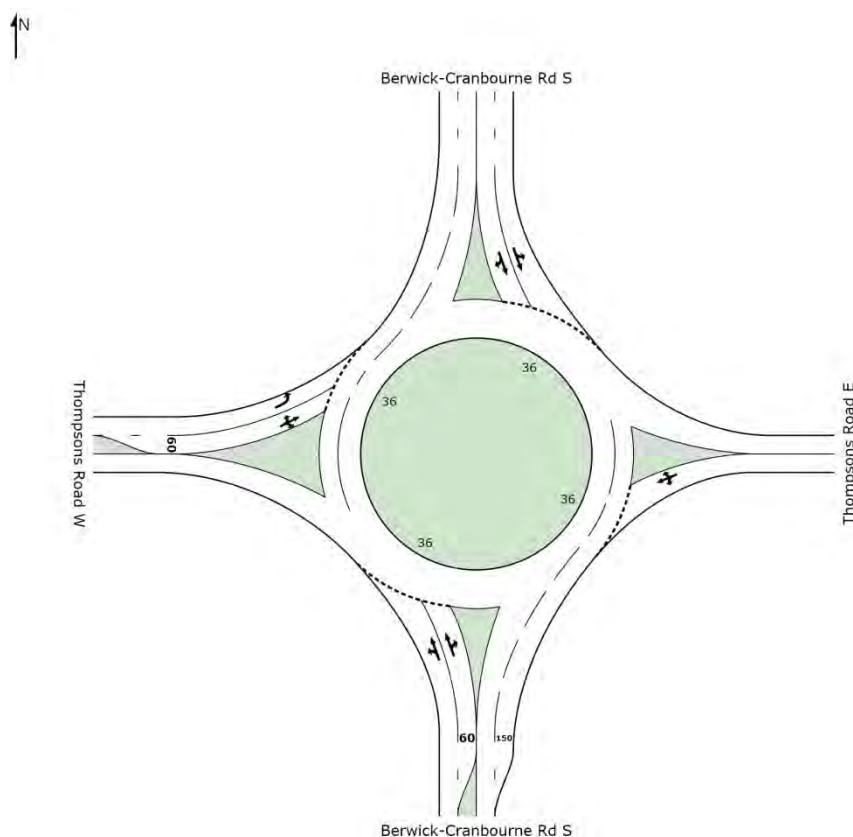


Table 7.2: Berwick-Cranbourne Road / Thompsons Road – Existing Unsignalised Intersection Operation

Approach	DOS		Average Delay (sec)		95 th Percentile Queue (m)	
	AM	PM	AM	PM	AM	PM
Berwick-Cranbourne Road (S)	#0.36	0.39	7s	6s	20m	22m
Thompsons Road (E)	0.04	0.08	8s	10s	1m	3m
Berwick-Cranbourne Road (N)	0.37	#0.44	8s	7s	20m	26m
Thompsons Road (W)	0.28	0.28	9s	9s	10m	10m

DOS – Degree of Saturation, # - Intersection DOS

² SIDRA INTERSECTION adopts the following criteria for Level of Service assessment:

		Intersection Degree of Saturation (X)	
		Unsignalised Intersection	Signalised Intersection
A	Excellent	<=0.50	<=0.60
B	Very Good	0.50-0.70	0.60-0.75
C	Good	0.70-0.80	0.75-0.90
D	Acceptable	0.80-0.90	0.90-0.95
E	Poor	0.90-1.00	0.95-1.00
F	Very Poor	>=1.0	>=1.0

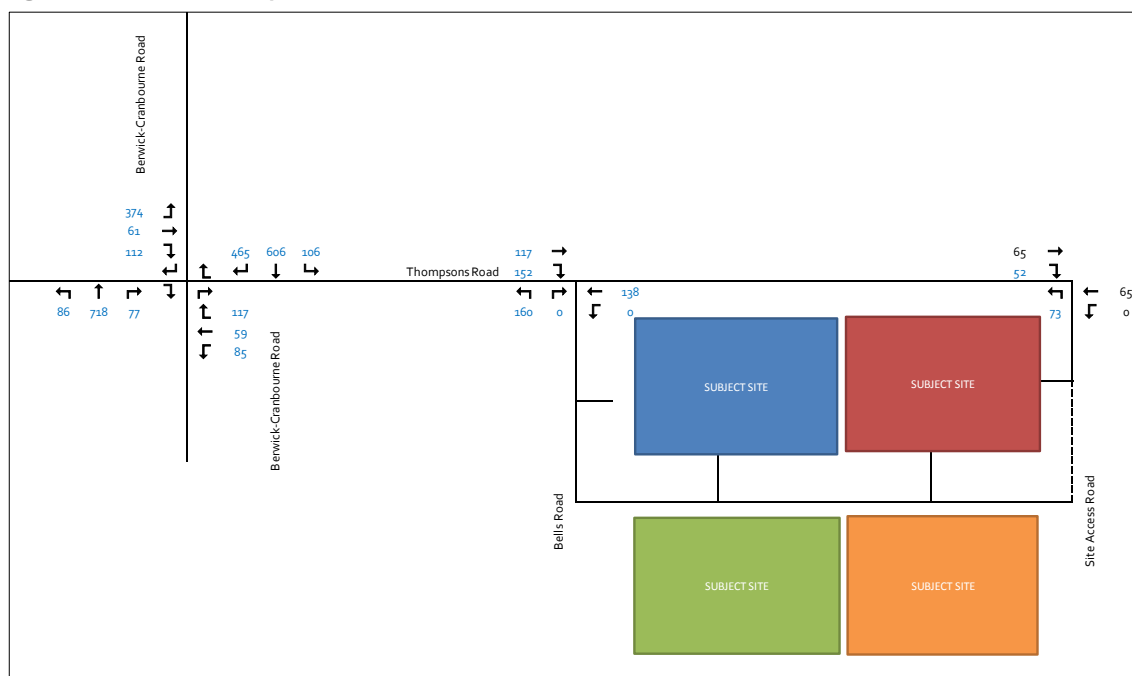
Table 7.2 indicates that the intersection of Berwick-Cranbourne Road / Thompsons Road currently operates well with minimal queues and delays on all approaches. The modelling outputs presented above have been confirmed by on-site observations.

7.5.3 Post Development 'Interim' Conditions

Post Development Traffic Volumes

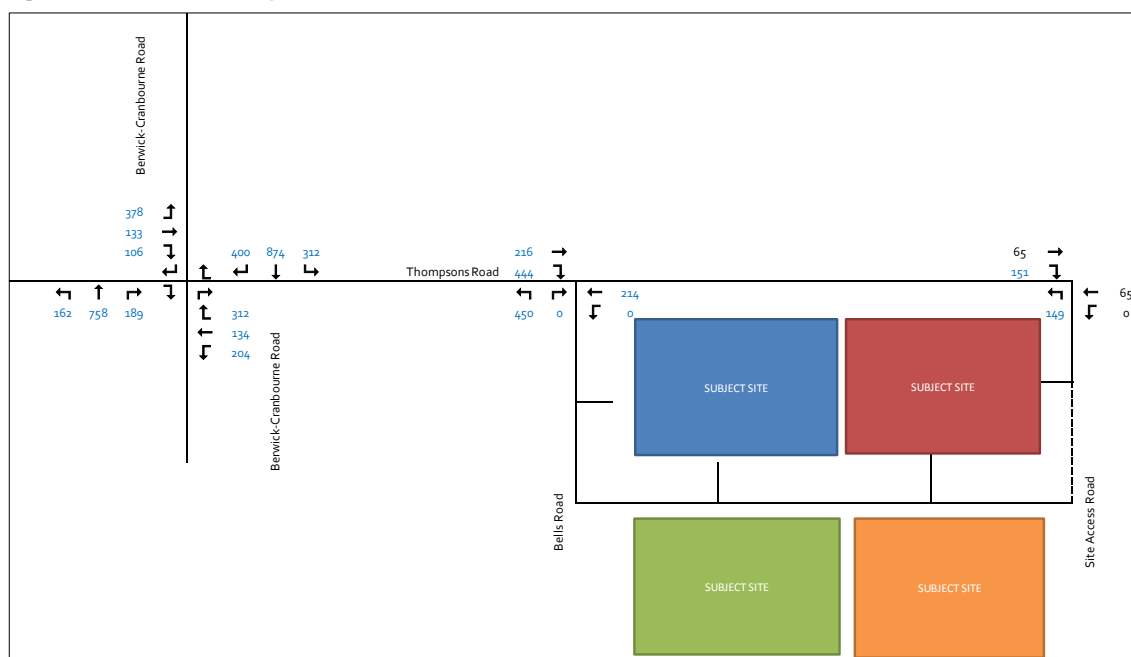
By adding the development traffic to the existing volumes we can assess the impact of the development generated traffic on the operation of the road network. It is noted that typical growth rates have been applied to Thompsons Road (i.e. 3% per annum linear for 10 years – year 2023) and in order to provide a conservative assessment³, it has been assumed an additional 50 vehicles per hour will travel east-west along Thompsons Road. The post development volumes are outlined in Figure 7.7 and Figure 7.8.

Figure 7.7: Post-Development AM Peak Hour Traffic Volumes



³ An attempt has been made to take into account the likely increases in background traffic along Thompsons Road in the short term given that Thompsons Road is likely to only service this development in the first instance.

Figure 7.8: Post-Development PM Peak Hour Traffic Volumes



The impact of the development traffic upon the key intersection in the vicinity of the site was assessed using SIDRA INTERSECTION software. Using the turning movement estimates presented previously and the existing intersection configuration as inputs, Table 7.3 presents a summary of the anticipated future operation of the Berwick-Cranbourne Road / Thompsons Road intersections following the Stage 1 development of the site. Detailed results of this analysis are provided in Appendix F.

Table 7.3: Berwick-Cranbourne Road / Thompsons Road – Post Development 'Interim' Operating Conditions

Approach	DOS		Average Delay (sec)		95 th Percentile Queue (m)	
	AM	PM	AM	PM	AM	PM
Berwick-Cranbourne Road (S)	#0.44	0.62	9s	14s	27m	57m
Thompsons Road (E)	0.41	#1.31	12s	300s	16m	819m
Berwick-Cranbourne Road (N)	0.44	0.67	8s	10s	25m	58m
Thompsons Road (W)	0.35	0.50	9s	11s	15m	26m

DOS – Degree of Saturation, # - Intersection DOS

Note: This model is based on an existing conditions road layout and the model has not been calibrated and is only appropriate for comparative purposes to understand the extent of changes that occur in the operation of the intersection.

As described earlier, a DOS of around 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.

The calculated intersection DOS suggests that mitigating measures will be required on the eastern approach to the intersection.

Mitigating Road Works

As indicated by the assessment above, the operation of the Berwick-Cranbourne Road / Thompsons Road intersection can be expected to deteriorate and operate above its theoretical

limit during the PM peak hour. In particular, it is noted that traffic on the eastern approach (Thompsons Road) is likely to experience delays and queues.

In this instance, it is considered that mitigating road works at the intersection will be required to facilitate traffic movements on the east approach:

- Provision of a short right turn lane in the order of 60m.
- Provision of additional circulating lanes within the existing roundabout lane via linemarking.

Figure 7.9 and Table 7.4 presents a summary of the modified roundabout configuration and its intersection operation, with full results presented in Appendix F.

Figure 7.9: Berwick-Cranbourne Road / Thompsons Road – Modified Unsignalised Intersection Configuration

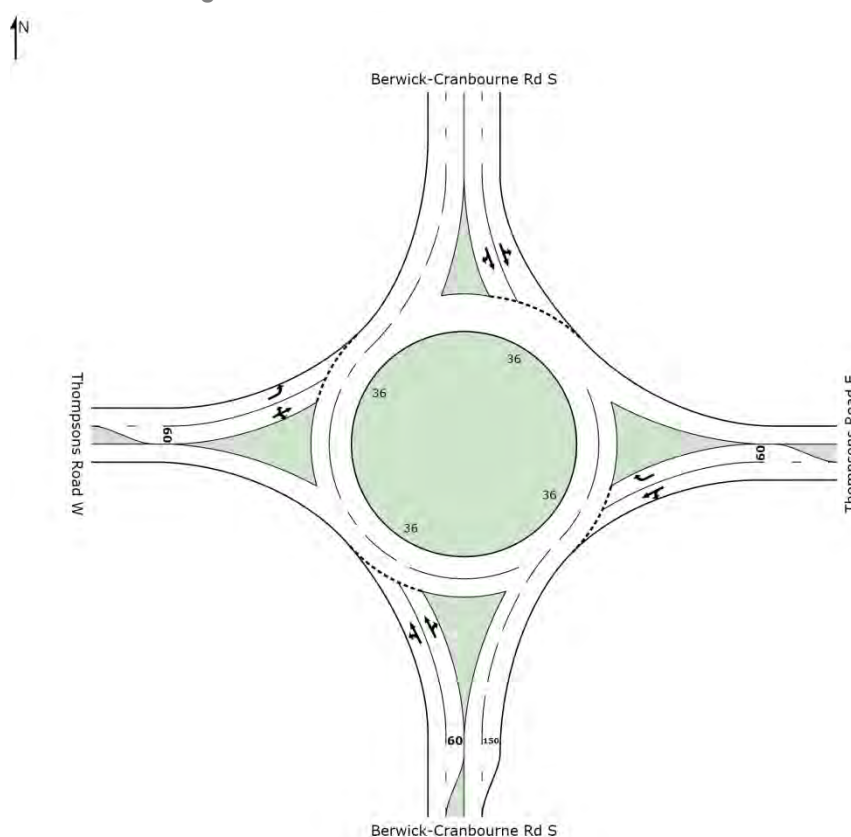


Table 7.4: Berwick-Cranbourne Road / Thompsons Road – Modified Unsignalised Intersection Operation

Approach	DOS		Average Delay (sec)		95 th Percentile Queue (m)	
	AM	PM	AM	PM	AM	PM
Berwick-Cranbourne Road (S)	#0.48	#0.70	8s	14s	26m	55m
Thompsons Road (E)	0.19	0.66	11s	15s	6m	34m
Berwick-Cranbourne Road (N)	0.44	0.67	8s	10s	25m	58m
Thompsons Road (W)	0.34	0.52	9s	12s	14m	28m

DOS – Degree of Saturation, # - Intersection DOS

Table 7.4 indicates that the intersection of Berwick-Cranbourne Road / Thompsons Road can be expected to operate in a satisfactory manner with manageable increases in both queues and delays on all approaches. The proposed mitigating road works are therefore considered to be appropriate and can be expected to materially improve the operation of the intersection upon the completion of the Stage 1 development.

In addition to the above and whilst it is noted that additional mitigating works may be possible, it is recommended that the need, nexus and equity of these additional road works, and their benefit and feasibility, be examined at future stages of the development when further information regarding the surrounding road network can be ascertained.

7.5.4 Nearby Intersections

Bells Road / Thompsons Road

The impact of the development has been assessed having regard to the traffic performance of the road network with the proposed Stage 1 development and adopting 3% per annum linear for 10 years scenario on Thompsons Road. As stated earlier, the aforementioned growth rate has been applied in addition to the assumption that 50 vehicles per hour travel east-west along Thompsons Road.

In this regard, the post development 'Interim' traffic volumes are presented below in Figure 7.10 and Figure 7.11 for both the AM and PM peak hours.

Figure 7.10: Year 2013 AM Peak Traffic Volumes with Site Traffic – New Access Points

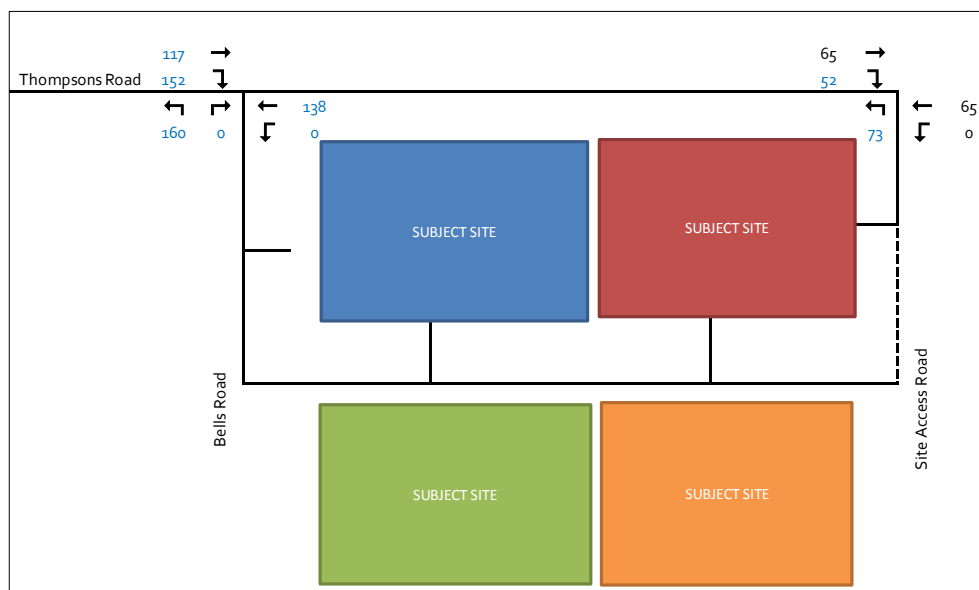
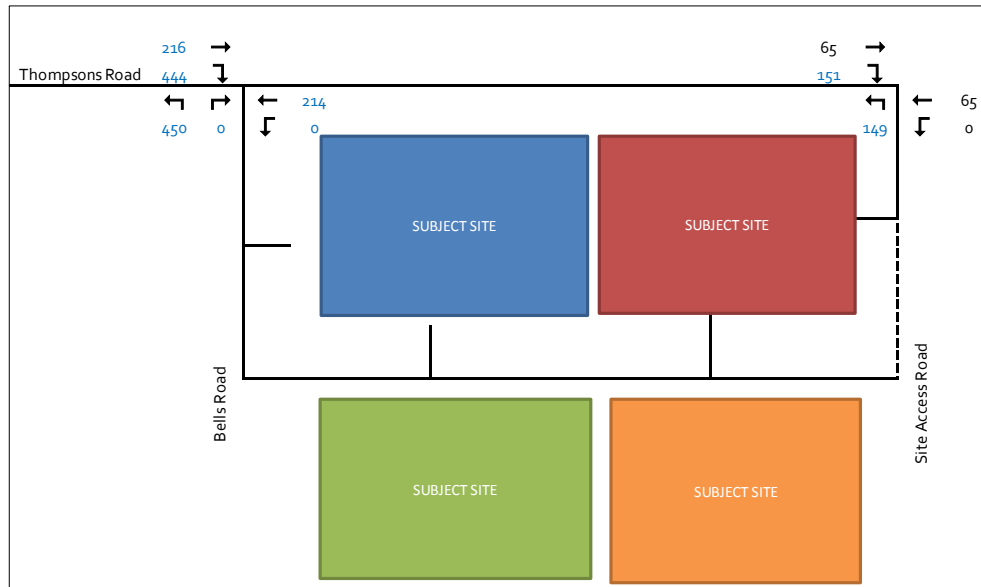


Figure 7.11: Year 2013 PM Peak Traffic Volumes with Site Traffic – New Access Points



Based on the above information, the proposed intersection configuration and a summary of its intersection operation are presented in Figure 7.12 and Table 7.5, with full results presented in Appendix F.

Figure 7.12: Bells Road / Thompsons Road – Proposed Unsignalised Intersection Configuration

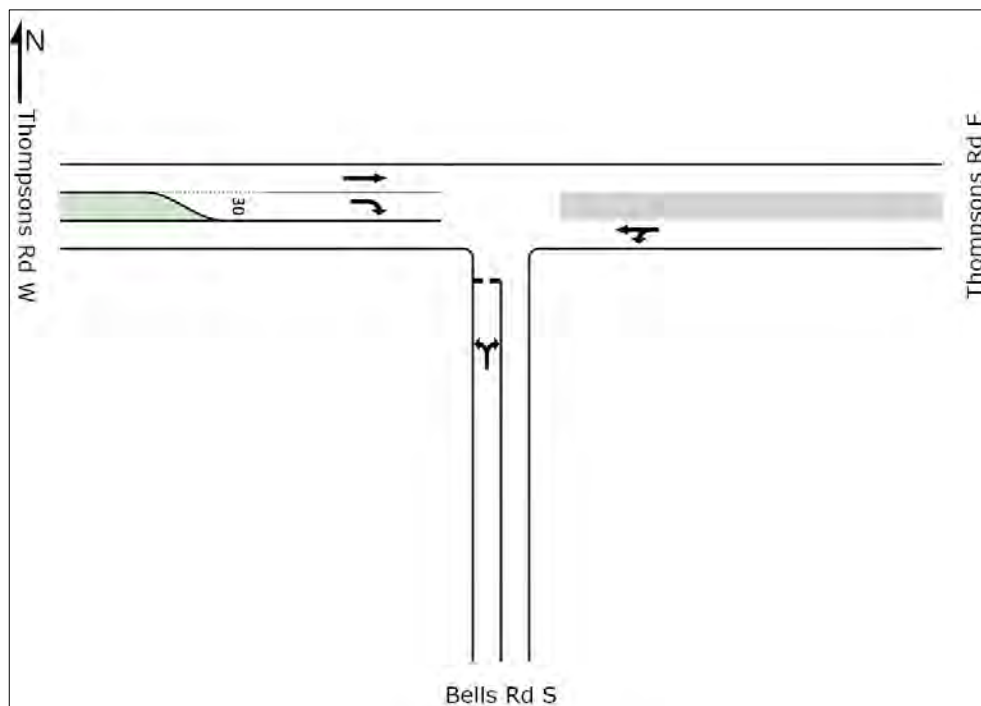


Table 7.5: Bells Road / Thompsons Road – Post Development 'Interim' Operating Conditions in 2023

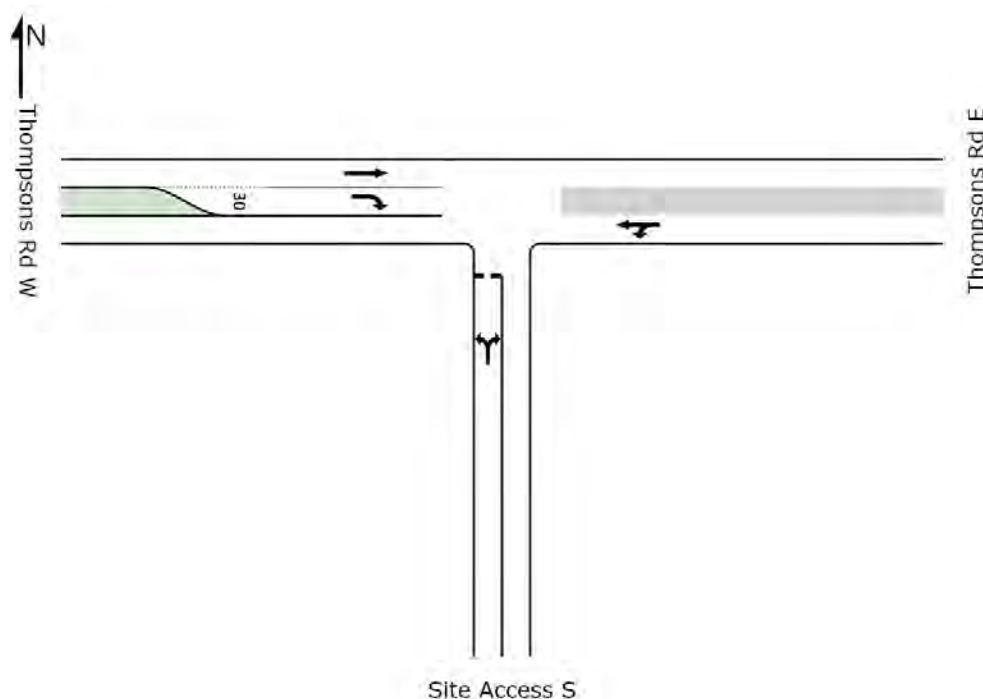
Approach	DOS		Average Delay (sec)		95 th Percentile Queue (m)	
	AM	PM	AM	PM	AM	PM
Bells Road (S)	#0.17	#0.50	9s	11s	5m	26m
Thompsons Road (E)	0.08	0.12	0s	0s	0m	0m
Thompsons Road (W)	0.16	0.46	5s	7s	4m	18m

DOS – Degree of Saturation, # – Intersection DOS

As indicated in Table 7.5, it is evident that the proposed unsignalised intersection at its 'interim' configuration can be expected to operate at 'very good' level of service with minimal queues and delays on all approaches.

Site Access Road/Thompsons Road

Based on the traffic volumes presented in Figure 7.10 and Figure 7.11, the proposed Site Access Road and Thompsons Road intersection configuration and a summary of its intersection performance are presented in Figure 7.13 and Table 7.6, with full results presented in Appendix F.

Figure 7.13: Site Access Road / Thompsons Road – Proposed Unsignalised Intersection Configuration

Table 7.6: Site Access Road / Thompsons Road – Post Development 'Interim' Operating Conditions in 2023

Approach	DOS		Average Delay (sec)		95 th Percentile Queue (m)	
	AM	PM	AM	PM	AM	PM
Site Access Road (S)	#0.07	0.14	9s	9s	2m	4m
Thompsons Road (E)	0.04	0.04	0s	0s	0m	0m
Thompsons Road (W)	0.05	#0.15	4s	6s	1m	4m

DOS – Degree of Saturation, # – Intersection DOS

As indicated in Table 7.5, it is evident that the proposed unsignalised intersection at its 'interim' configuration can be expected to operate at 'excellent' level of service with minimal queues and delays on all approaches. In addition, the analysis indicates that the intersection has sufficient capacity to accommodate additional traffic in the future.

8. Conclusion

Based on the analysis and discussions presented within this report, the following conclusions are made:

- i The proposed development (Stage 1) generates a statutory parking requirement of 960 spaces, for those uses with nominated rates.
- ii A supply of 1,364 spaces has been provided as part of Stage 1 of the development.
- iii The proposed parking layout is consistent with the dimensional requirements as set out in the Casey Planning Scheme and/or Australian/New Zealand Standards for Off Street Car Parking (AS/NZS2890.1:2004 and AS/NZS2890.6:2009).
- iv Clause 52.34 of the Casey Planning Scheme requires the provision of bicycle facilities and some 69 bicycle parking spaces for both staff and visitors to St Germain Village. Ample space exists across the site to provide this level of cycle parking and associated facilities.
- v The provision of loading areas across the site is deemed to be adequate and the appropriate design vehicles can access the loading areas as required.
- vi The site is expected to generate up to 1,050 and 12,000 vehicle movements in any peak hour and daily respectively.
- vii The following mitigating works are proposed on the road network to ameliorate offsite traffic impacts:

Intersection of Berwick-Cranbourne Road and Thompsons Road

- Provision of a short right turn lane in the order of 60m.
- Provision of additional circulating lanes within the existing roundabout lane via linemarking.

Other

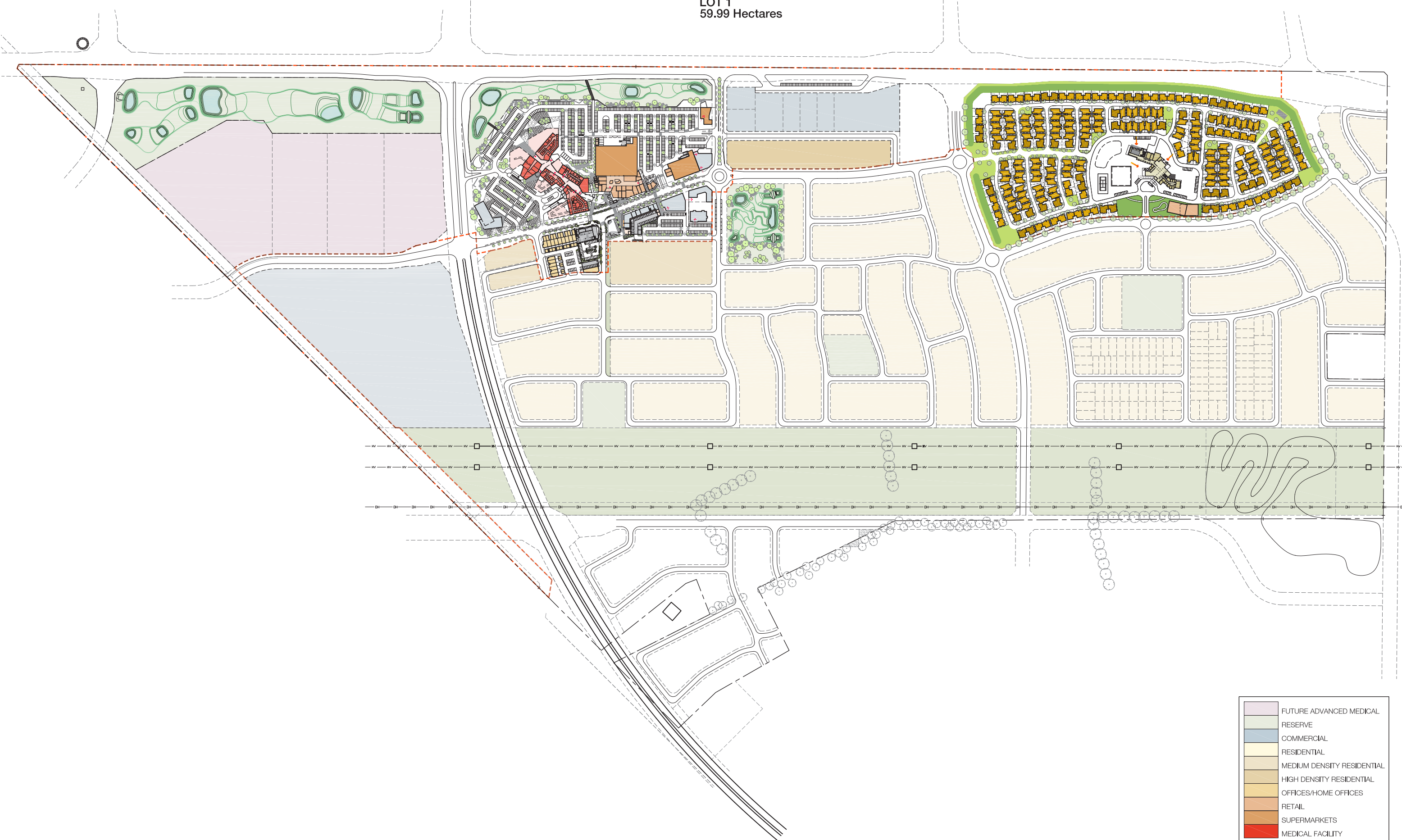
- Appropriate basic unsignalised intersection treatments (including a 30m right turn lane on the west approach) at the following locations:
 - Thompsons Road / Future Bells Road
 - Thompsons Road / new north south road.
- viii Provision is made for all access arrangements to operate safely and efficiently at least 10yrs after full development.

Appendix A

Appendix A

Proposed Development – Sub-Precincts

LOT 1
59.99 Hectares



THOMPSONS ROAD

MEDICAL PRECINCT

NORTH-EAST PRECINCT

DRAINAGE RESERVE
1.75 Hectares

MIXED USE
5.73 Hectares

HIGH DENSITY
RESIDENTIAL
1.41 Hectares

To Retirement Village

DRAINAGE
RESERVE
1.41 Ha

SOUTH-EAST PRECINCT

TOWN HOUSES

SOUTH-WEST PRECINCT

PARK

GYMNASIUM

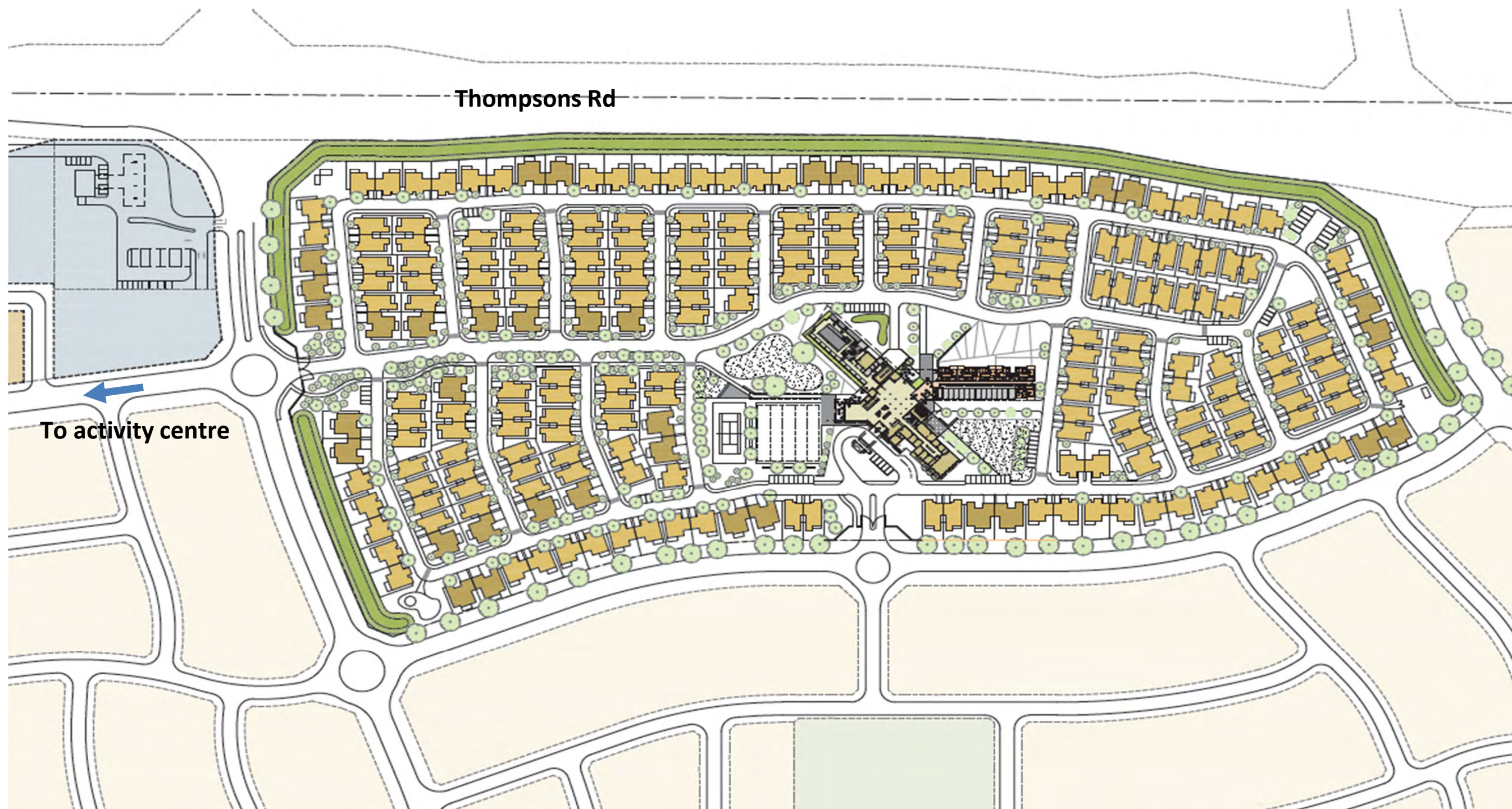
COMMUNITY
ACTIVITY
CENTRE
1000sqm

CHILD
CARE
CENTRE

MINI
MAJOR

TAVERN

RESTAURANT



Thompsons Rd

To activity centre

Appendix B

Existing Conditions

B.1 Road Network

B.1.1 Adjoining Roads

Pound Road

Pound Road functions as a collector road and is located within a Road Zone (Category 2) in the Casey Planning Scheme. It is a two-way unsealed road aligned in a north/south direction and configured with a 2-lane, 6.2 metre wide carriageway set within a 16.5 metre wide road reserve (approx.).

Thompsons Road

Thompsons Road functions as a local road and is located within an Urban Growth Zone (Category 3) in the Casey Planning Scheme. It is a two-way unsealed road aligned in an east/west direction and configured with a 2 lane, 5.5 metre wide carriageway set within a 14 metre wide road reserve (approx.).

Other Roads

Other roads within the vicinity of the site include Soldiers Road which operates as local road.

Pound Road and Thompsons Road are shown in Figure B1 and Figure B2 respectively.

Figure B1: Pound Road (Adjacent to Site)



Figure B2: Thompsons Road (Adjacent to Site)



B.1.2 Surrounding Intersections

Key intersections in the vicinity of the site include:

- Pound Road/Thompsons Road (unsignalised intersection)
- Thompsons Road/Soldiers Road (unsignalised T-intersection).

B.2 Sustainable Transport Infrastructure

B.2.1 Public Transport

Limited public transport facilities exist within the vicinity of the subject site. Currently the nearest bus service is 3km from the subject site, located along Berwick-Cranbourne Road.

B.2.2 Pedestrian Infrastructure

Formalised pedestrian facilities (footpaths) are not provided along Pound Road and Thompsons Road. It is feasible for pedestrians to walk along the wide road reserve areas adjacent to these roads.

B.2.3 Cycle Infrastructure

The Principal Bicycle Network (PBN) is a network of arterial cycling routes in metropolitan Melbourne:

- The PBN currently consists of approximately 3500 kilometres of existing and proposed on-road and off-road bicycle routes. So far, approximately 1200 kilometres of the network has been completed.
- Vic Roads has primary responsibility for managing the development of the PBN.
- Bicycle facilities on the PBN are implemented by Vic Roads and local councils depending on whether they are on an arterial or local road.

The following map shows the existing and proposed on and off road bicycle facilities making up the PBN in the vicinity of the subject site.

Figure B.1: Vic Roads Principal Bicycle Network



(Reproduced from Vic Roads Website)

Figure B.1 shows that limited bike path facilities exist within the vicinity of the subject site.

Appendix C

Planning Policy Background

C.1 Melbourne 2030

Melbourne 2030 was a strategic plan prepared in 2002 to manage growth and change across metropolitan Melbourne and its surrounding region. It established a framework to cater for the anticipated population growth with the identification of required land uses and development in a more sustainable manner.

One of the key focuses of Melbourne 2030 was to promote an increase in housing within the established urban area, particularly around activity centres and other strategic sites suitable for intense development.

Melbourne 2030 sought to encourage higher density development on sites in and around activity centres and proximate to public transport. Such an outcome would under the framework of Melbourne 2030:

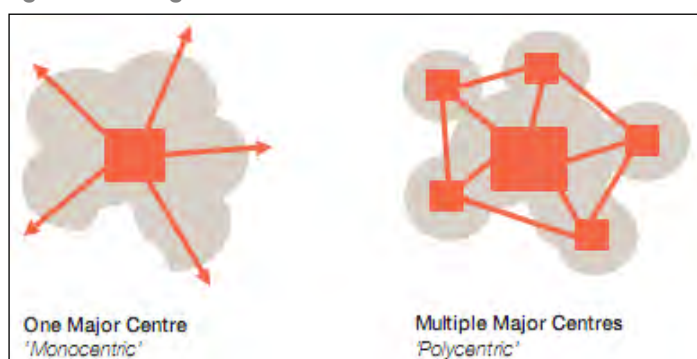
- *"Provide for the forecast increase in population and households"*
- *Ensure the available housing stock better matches changing demand by widening housing choice, particularly in middle and outer suburbs*
- *Support opportunities for a wide range of income groups to choose housing in well serviced locations*
- *Increase the local population base that supports activity centres and local businesses*
- *Encourage walking, cycling and public transport as viable transport alternatives."*

C.2 Melbourne @ 5 Million

Developed and released in conjunction with the Victorian Transport Plan, Melbourne @ 5 Million provided a framework for the future vision of Melbourne. Following on from the objectives of Melbourne 2030, Melbourne @ 5 Million continued the key themes of "a more compact city", "better management of growth", "networks within regional cities" and "a more greener city".

A key component of Melbourne @ 5 Million was the refinement of settlement patterns in a manner which not only changes where people live and work but also how they travel – with shorter, more local trips. This idea was demonstrated through the development of polycentric town centres, as demonstrated in Figure D.1.

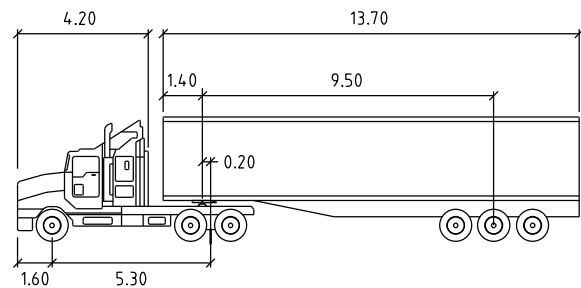
Figure D.1: Single Centre vs. Multi-Centre Structure



It is evident that the subject site is to be developed as a hub in its own right, where access to public transport exists and co-location with employment uses is high. This arrangement supports efforts to increase the rate of shorter trips and support trips by means other than the private motor vehicle.

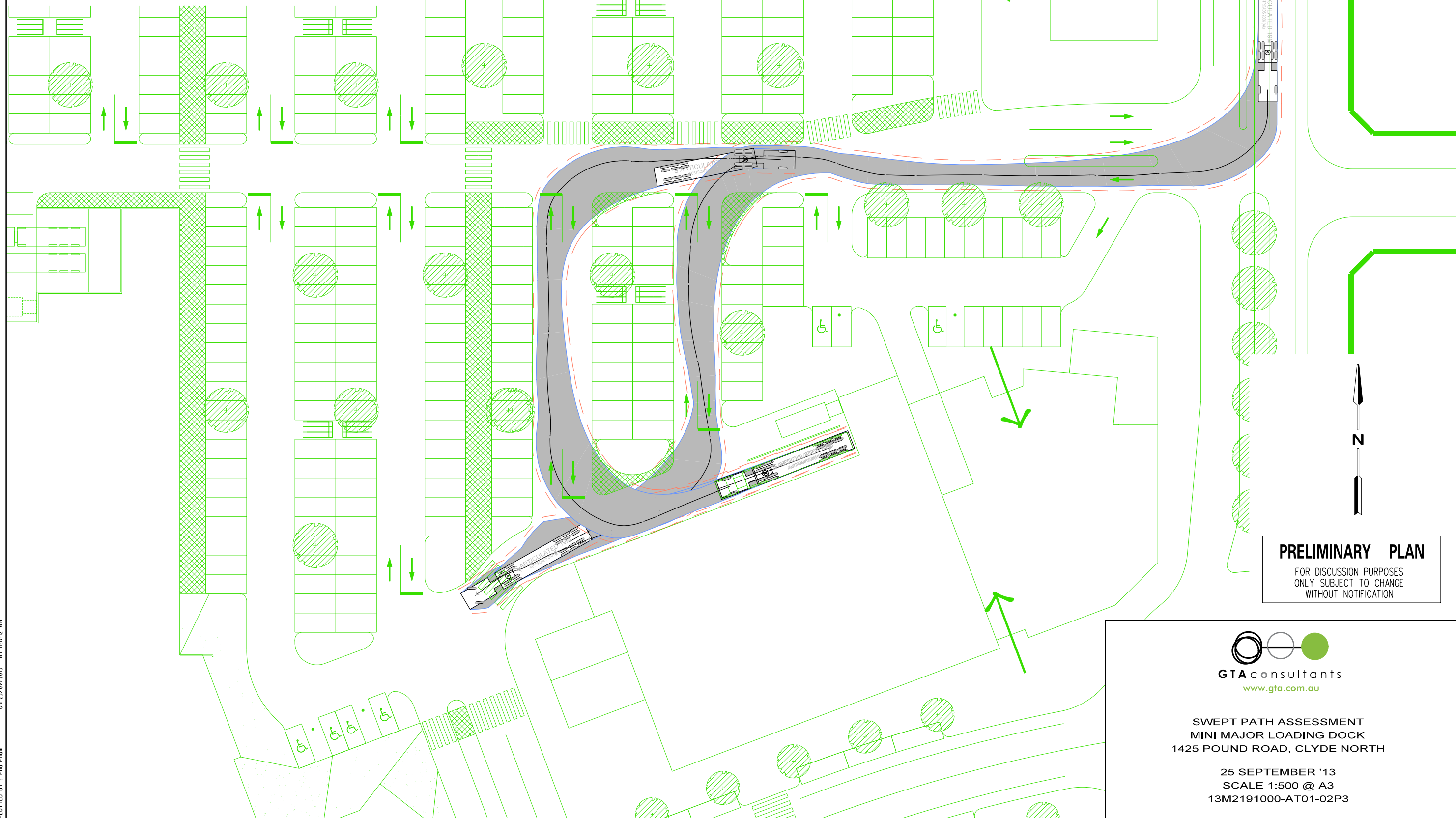
Appendix D

Swept Paths



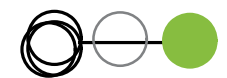
S ARTICULATED 19M

Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 27.7
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		



PRELIMINARY PLAN

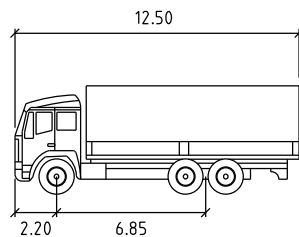
FOR DISCUSSION PURPOSES
ONLY SUBJECT TO CHANGE
WITHOUT NOTIFICATION



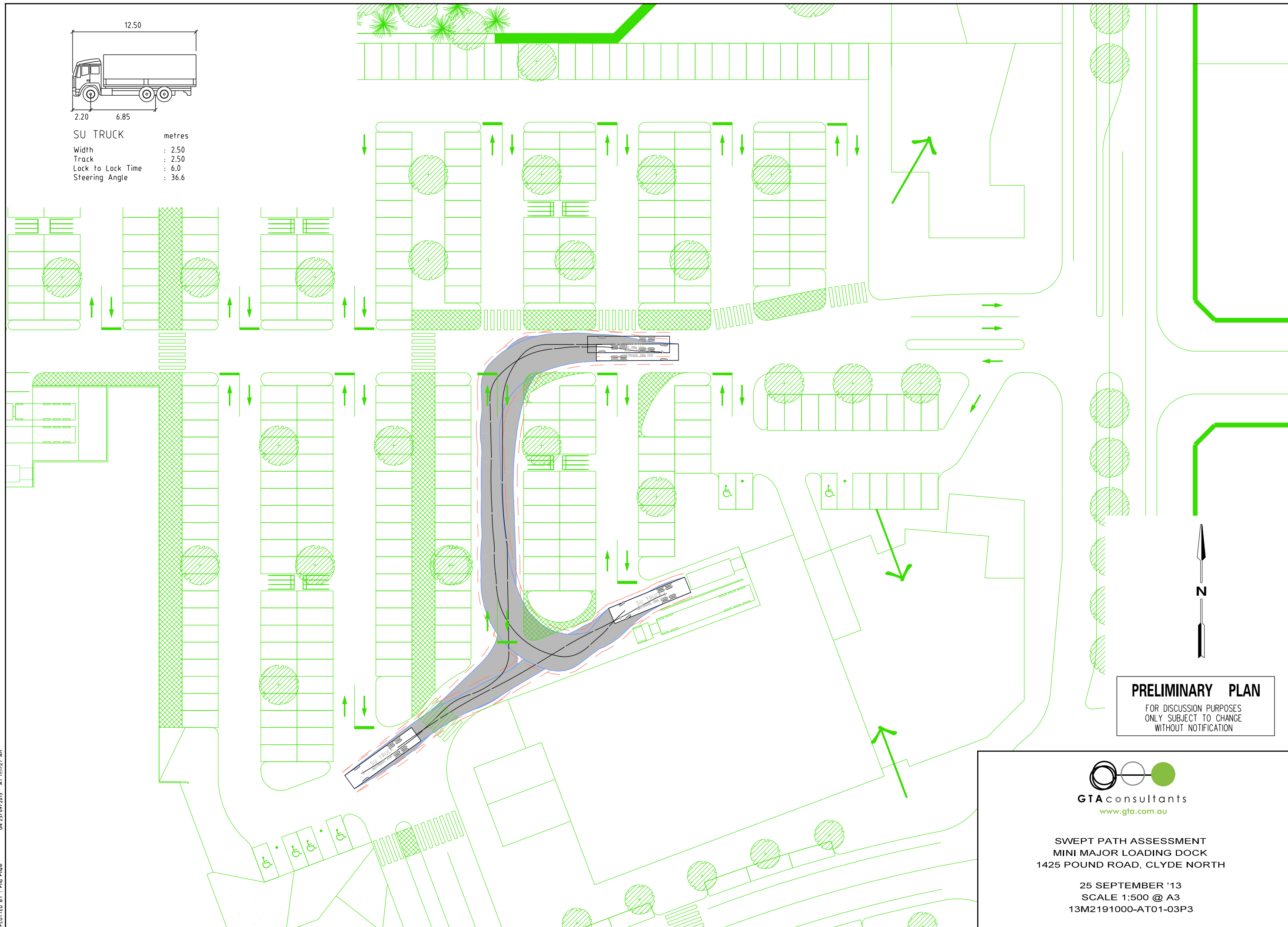
GTA consultants
www.gta.com.au

SWEPT PATH ASSESSMENT
MINI MAJOR LOADING DOCK
1425 POUND ROAD, CLYDE NORTH

25 SEPTEMBER '13
SCALE 1:500 @ A3
13M2191000-AT01-02P3



SU TRUCK metres
Width : 2.50
Track : 2.50
Lock to Lock Time : 6.0
Steering Angle : 36.6

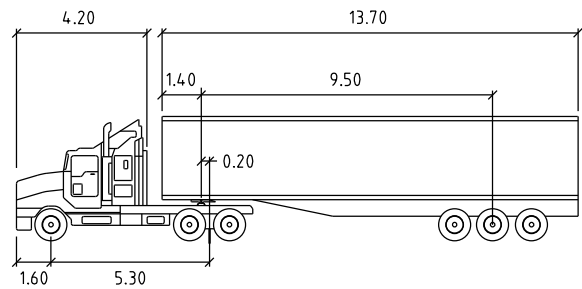


PRELIMINARY PLAN
FOR DISCUSSION PURPOSES
ONLY SUBJECT TO CHANGE
WITHOUT NOTIFICATION



SWEPT PATH ASSESSMENT
MINI MAJOR LOADING DOCK
1425 POUND ROAD, CLYDE NORTH

25 SEPTEMBER '13
SCALE 1:500 @ A3
13M2191000-AT01-03P3



S ARTICULATED 19M

Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 27.7
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

metres

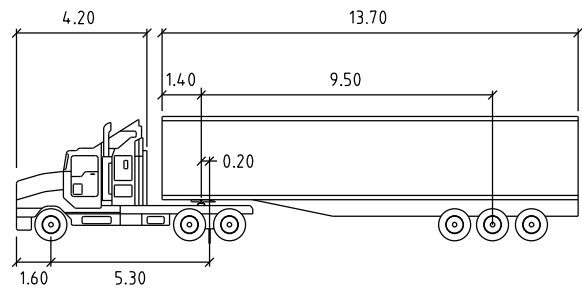


PRELIMINARY PLAN
FOR DISCUSSION PURPOSES
ONLY SUBJECT TO CHANGE
WITHOUT NOTIFICATION



SWEPT PATH ASSESSMENT
SUPER MARKET LOADING DOCK
1425 POUND ROAD, CLYDE NORTH

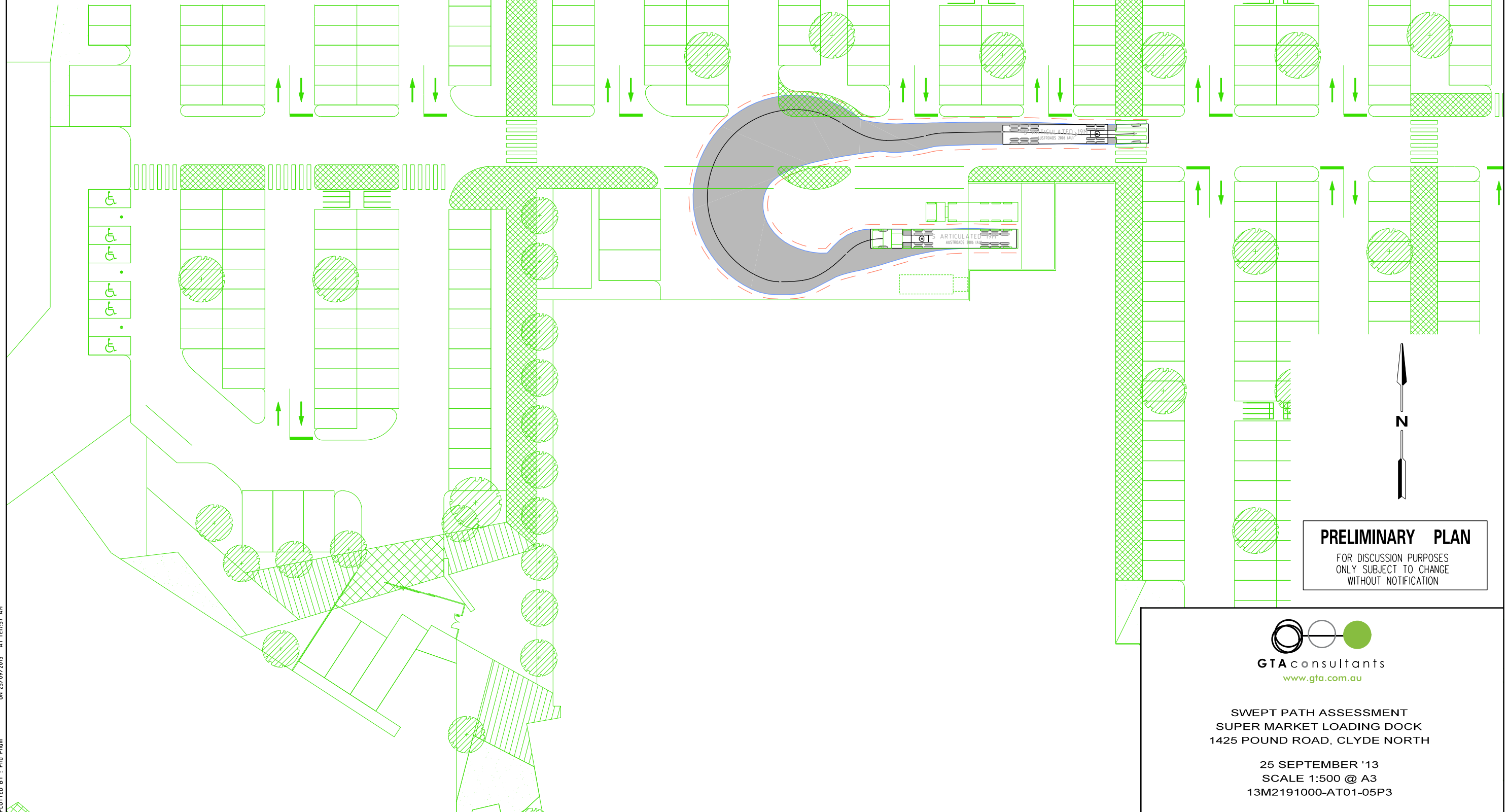
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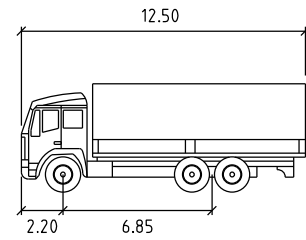


S ARTICULATED 19M

Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 27.7
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

metres





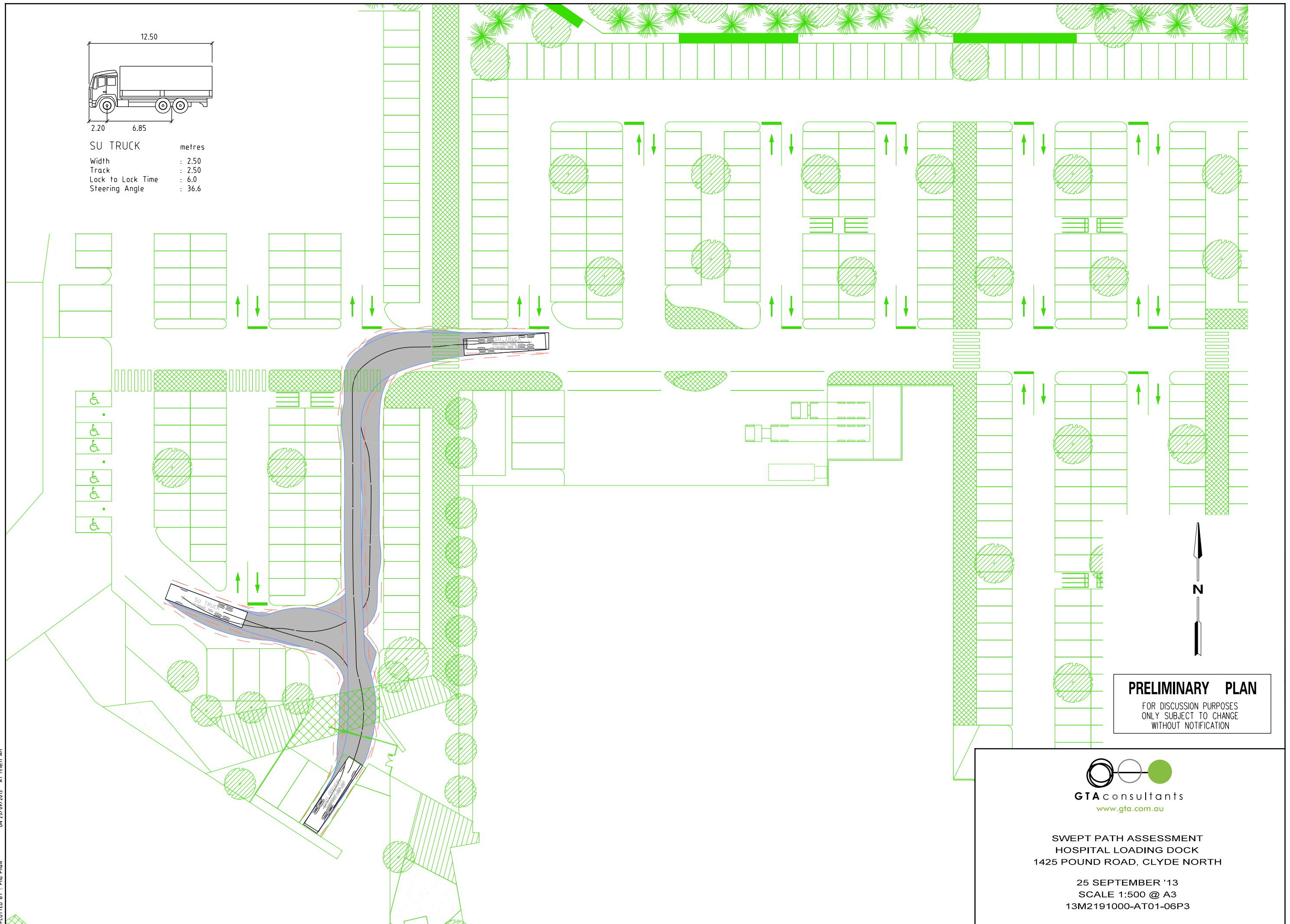
SU TRUCK metres

Width : 2.50

Track : 2.50

Lock to Lock Time : 6.0

Steering Angle : 36.6



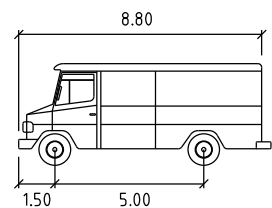
PRELIMINARY PLAN

FOR DISCUSSION PURPOSES
ONLY SUBJECT TO CHANGE
WITHOUT NOTIFICATION



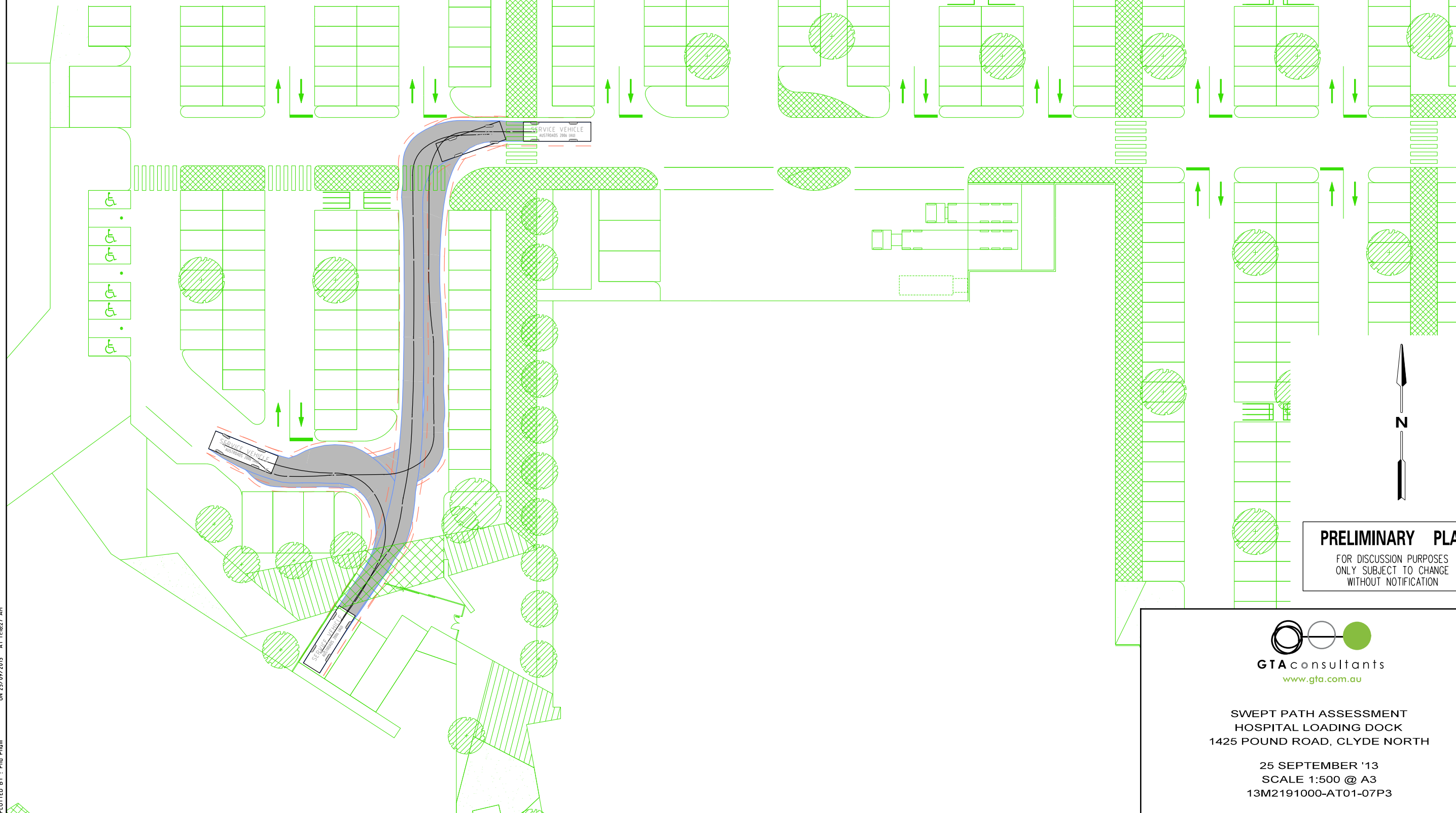
**SWEPT PATH ASSESSMENT
HOSPITAL LOADING DOCK
1425 POUND ROAD, CLYDE NORTH**

25 SEPTEMBER '13
SCALE 1:500 @ A3
13M2191000-AT01-06P3



SERVICE VEHICLE metres

Width : 2.50
Track : 2.50
Lock to Lock Time : 6.0
Steering Angle : 38.7



PRELIMINARY PLAN

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GTAconsultants
www.gta.com.au

**SWEPT PATH ASSESSMENT
HOSPITAL LOADING DOCK
1425 POUND ROAD, CLYDE NORTH**

**25 SEPTEMBER '13
SCALE 1:500 @ A3
13M2191000-AT01-07P3**

Appendix E

Traffic Generation

E.1 Traffic Generation

E.1.1 Design Rates

Traffic generation estimates for the proposed development have been sourced from GTA Consultants' survey database, RTANSW and other consultant's surveyed rates. These are summarised in the below table.

					Traffic Generation Rate			Traffic Generation			AM		PM		Daily		AM		PM		Daily	
Superlot/ Precinct	Stage	Use	Size	Unit	AM	PM	Daily	AM	PM	Daily	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
A	1	Medical Centre/Super Clinic	60	practitioners	4.7 /practitioner	5.8 /practitioner	39.0 /practitioner	282 vph	348 vph	2,340 vpd	50%	50%	50%	50%	50%	50%	141 vph	141 vph	174 vph	174 vph	1,170 vpd	1,170 vpd
B	1	Supermarket	4,000	sqm	1.4 /sqm LFA	14.4 /sqm LFA	131.0 /sqm LFA	58 vph	576 vph	5,240 vpd	50%	50%	50%	50%	50%	50%	29 vph	29 vph	288 vph	288 vph	2,620 vpd	2,620 vpd
		Retail / specialty shops / cafes	1,840	sqm	1.3 /sqm LFA	12.5 /100sqm LFA	121.0 /100sqm LFA	23 vph	230 vph	2,226 vpd	50%	50%	50%	50%	50%	50%	12 vph	12 vph	115 vph	115 vph	1,113 vpd	1,113 vpd
	2	Mini Major	1,550	sqm	1.3 /sqm LFA	12.5 /100sqm LFA	121.0 /100sqm LFA	19 vph	194 vph	1,876 vph	50%	50%	50%	50%	50%	50%	10 vph	10 vph	97 vph	97 vph	938 vpd	938 vpd
		Retail / specialty shops	140	sqm	1.3 /sqm LFA	12.5 /100sqm LFA	121.0 /100sqm LFA	2 vph	18 vph	169 vph	50%	50%	50%	50%	50%	50%	1 vph	1 vph	9 vph	9 vph	85 vpd	85 vpd
		Licensed Restaurant	450	sqm	2.5 /100sqm GFA	5 /100sqm GFA	60 /100sqm GFA	11 vph	23 vph	270 vph	50%	50%	50%	50%	50%	50%	6 vph	6 vph	12 vph	12 vph	135 vpd	135 vpd
C	1	Tavern	750	sqm	2.2 /100sqm LFA	8.8 /100sqm LFA	12.5 /100sqm LFA	17 vph	66 vph	94 vpd	50%	50%	50%	50%	50%	50%	9 vph	9 vph	33 vph	33 vph	47 vpd	47 vpd
		Retail / cafes / banks etc	760	sqm	1.3 /sqm LFA	12.5 /100sqm LFA	121.0 /100sqm LFA	10 vph	95 vph	920 vpd	50%	50%	50%	50%	50%	50%	5 vph	5 vph	48 vph	48 vph	460 vpd	460 vpd
		2 bed apartments	34	dwellings	0.8 vph/dwelling	0.8 vph/dwelling	8.0 vpd/dwelling	27 vph	27 vph	272 vpd	20%	80%	60%	40%	50%	50%	5 vph	22 vph	16 vph	11 vph	136 vpd	136 vpd
	2	Penthouses	2	dwellings	0.8 vph/dwelling	0.8 vph/dwelling	8.0 vpd/dwelling	2 vph	2 vph	16 vpd	20%	80%	60%	40%	50%	50%	0 vph	2 vph	1 vph	1 vph	8 vpd	8 vpd
		Community Act Cntr (30 car spaces)	30		1.0 /place	1.0 /place	2.0 /place	30 vph	30 vph	60 vpd	50%	50%	50%	50%	50%	50%	15 vph	15 vph	15 vph	15 vph	30 vpd	30 vpd
D	1	Gymnasium	1,000	sqm	4.5 /100sqm GFA	9 /100sqm GFA	45 /100sqm GFA	45 vph	90 vph	450 vph	50%	50%	50%	50%	50%	50%	23 vph	23 vph	45 vph	45 vph	225 vpd	225 vpd
		Child care centre	120	places	1.4 /place	0.7 /place	3.0 /place	168 vph	84 vph	360 vph	50%	50%	50%	50%	50%	50%	84 vph	84 vph	42 vph	42 vph	180 vpd	180 vpd
		Offices	1,600	sqm	2.0 /100sqm LFA	2.0 /100sqm LFA	10.0 /100sqm LFA	32 vph	32 vph	160 vpd	90%	10%	20%	80%	50%	50%	29 vph	3 vph	6 vph	26 vph	80 vpd	80 vpd
	2	Ground floor office suites	170	sqm	2.0 /100sqm LFA	2.0 /100sqm LFA	10.0 /100sqm LFA	3 vph	3 vph	17 vpd	90%	10%	20%	80%	50%	50%	3 vph	0 vph	1 vph	2 vph	9 vpd	9 vpd
		Retail / wine bar	240	sqm	1.3 /sqm LFA	12.5 /100sqm LFA	121.0 /100sqm LFA	3 vph	30 vph	290 vpd	50%	50%	50%	50%	50%	50%	2 vph	2 vph	15 vph	15 vph	145 vpd	145 vpd
E	1	SOHOS	8	tenacies	0.8 vph/dwelling	0.8 vph/dwelling	8.0 vpd/dwelling	6 vph	6 vph	64 vph	20%	80%	60%	40%	50%	50%	1 vph	5 vph	4 vph	2 vph	32 vpd	32 vpd
		Townhouses	6	dwellings	0.8 vph/dwelling	0.8 vph/dwelling	8.0 vpd/dwelling	5 vph	5 vph	48 vph	20%	80%	60%	40%	50%	50%	1 vph	4 vph	3 vph	2 vph	24 vpd	24 vpd
		Retirement Village (including residential building)	260	dwellings	0.2 vph/dwelling	0.2 vph/dwelling	2.0 vpd/dwelling	62 vph	52 vph	520 vph	20%	80%	60%	40%	50%	50%	12 vph	50 vph	31 vph	21 vph	260 vpd	260 vpd
	2																					
TOTAL								805 vph	1,563 vph	15,392 vpd							388 vph	423 vph	955 vph	958 vph	7,697 vph	7,697 vph
Stage 1 with Retirement Village								502 vph	1,047 vph	12,001 vph							238 vph	266 vph	695 vph	701 vph	6,001 vph	6,001 vph
Stage2								303 vph	516 vph	3,391 vph							150 vph	157 vph	260 vph	257 vph	1,696 vph	1,696 vph

Appendix F

SIDRA Intersection Results

MOVEMENT SUMMARY

Site: Existing AM Peak -
Roundabout

Berwick-Cranbourne Rd Intersection
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow 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: Berwick-Cranbourne Rd S											
1	L	91	5.0	0.359	7.2	LOS A	2.7	19.9	0.67	0.63	48.7
2	T	756	5.0	0.359	6.3	LOS A	2.7	19.9	0.68	0.58	48.6
3	R	17	5.0	0.359	14.1	LOS B	2.5	18.0	0.69	0.88	45.9
Approach		863	5.0	0.359	6.6	LOS A	2.7	19.9	0.68	0.59	48.6
East: Thompsons Road E											
4	L	16	5.0	0.042	8.3	LOS A	0.2	1.3	0.65	0.72	48.5
5	T	13	5.0	0.042	7.3	LOS A	0.2	1.3	0.65	0.66	48.5
6	R	1	5.0	0.042	14.6	LOS B	0.2	1.3	0.65	0.89	45.1
Approach		29	5.0	0.042	8.1	LOS A	0.2	1.3	0.65	0.70	48.3
North: Berwick-Cranbourne Rd S											
7	L	4	5.0	0.370	5.7	LOS A	2.8	20.2	0.39	0.52	50.4
8	T	638	5.0	0.370	4.5	LOS A	2.8	20.2	0.39	0.41	50.9
9	R	489	5.0	0.370	12.2	LOS B	2.7	19.4	0.42	0.64	45.1
Approach		1132	5.0	0.370	7.8	LOS A	2.8	20.2	0.40	0.51	48.1
West: Thompsons Road W											
10	L	394	5.0	0.281	7.0	LOS A	1.4	10.4	0.63	0.62	48.2
11	T	21	5.0	0.281	6.2	LOS A	1.3	9.7	0.64	0.57	47.7
12	R	118	5.0	0.281	13.6	LOS B	1.3	9.7	0.64	0.90	45.2
Approach		533	5.0	0.281	8.5	LOS A	1.4	10.4	0.63	0.68	47.4
All Vehicles		2557	5.0	0.370	7.5	LOS A	2.8	20.2	0.55	0.58	48.1

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

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 used.

MOVEMENT SUMMARY

Site: Existing PM Peak -
Roundabout

Berwick-Cranbourne Rd Intersection
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Berwick-Cranbourne Rd S											
1	L	171	5.0	0.391	7.0	LOS A	3.0	21.7	0.64	0.61	48.7
2	T	798	5.0	0.391	6.1	LOS A	3.0	21.7	0.65	0.56	48.8
3	R	11	5.0	0.391	13.9	LOS B	2.7	19.9	0.67	0.88	46.2
Approach		979	5.0	0.391	6.4	LOS A	3.0	21.7	0.65	0.57	48.7
East: Thompsons Road E											
4	L	25	5.0	0.082	9.1	LOS A	0.4	2.7	0.70	0.80	47.8
5	T	15	5.0	0.082	8.1	LOS A	0.4	2.7	0.70	0.73	47.7
6	R	13	5.0	0.082	15.5	LOS B	0.4	2.7	0.70	0.93	44.3
Approach		53	5.0	0.082	10.3	LOS B	0.4	2.7	0.70	0.81	46.8
North: Berwick-Cranbourne Rd S											
7	L	15	5.0	0.437	5.7	LOS A	3.5	25.9	0.39	0.51	50.4
8	T	920	5.0	0.437	4.5	LOS A	3.5	25.9	0.40	0.41	50.7
9	R	421	5.0	0.437	12.1	LOS B	3.4	25.0	0.43	0.68	45.7
Approach		1356	5.0	0.437	6.9	LOS A	3.5	25.9	0.41	0.50	48.9
West: Thompsons Road W											
10	L	398	5.0	0.282	7.1	LOS A	1.4	10.4	0.64	0.63	48.1
11	T	15	5.0	0.282	6.4	LOS A	1.3	9.7	0.65	0.59	47.6
12	R	112	5.0	0.282	13.8	LOS B	1.3	9.7	0.65	0.91	45.1
Approach		524	5.0	0.282	8.5	LOS A	1.4	10.4	0.64	0.69	47.4
All Vehicles		2912	5.0	0.437	7.1	LOS A	3.5	25.9	0.54	0.56	48.5

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

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 used.

MOVEMENT SUMMARY

Site: Interim AM Peak -
Roundabout

Berwick-Cranbourne Rd Intersection
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Berwick-Cranbourne Rd S											
1	L	91	5.0	0.443	8.4	LOS A	3.7	27.4	0.82	0.74	47.9
2	T	756	5.0	0.443	7.8	LOS A	3.7	27.4	0.82	0.72	47.4
3	R	81	5.0	0.443	15.9	LOS B	3.4	24.7	0.82	0.92	44.4
Approach		927	5.0	0.443	8.5	LOS A	3.7	27.4	0.82	0.74	47.2
East: Thompsons Road E											
4	L	89	5.0	0.405	9.5	LOS A	2.2	15.9	0.76	0.87	47.1
5	T	62	5.0	0.405	8.5	LOS A	2.2	15.9	0.76	0.80	46.8
6	R	123	5.0	0.405	15.9	LOS B	2.2	15.9	0.76	0.99	43.8
Approach		275	5.0	0.405	12.1	LOS B	2.2	15.9	0.76	0.91	45.4
North: Berwick-Cranbourne Rd S											
7	L	112	5.0	0.438	6.3	LOS A	3.4	25.1	0.53	0.55	49.5
8	T	638	5.0	0.438	5.1	LOS A	3.4	25.1	0.53	0.46	49.6
9	R	489	5.0	0.438	12.9	LOS B	3.3	23.7	0.56	0.71	44.7
Approach		1239	5.0	0.438	8.2	LOS A	3.4	25.1	0.54	0.57	47.4
West: Thompsons Road W											
10	L	394	5.0	0.350	7.7	LOS A	2.0	14.5	0.73	0.67	47.5
11	T	64	5.0	0.350	7.2	LOS A	1.8	13.4	0.73	0.67	47.0
12	R	118	5.0	0.350	14.6	LOS B	1.8	13.4	0.73	0.95	44.8
Approach		576	5.0	0.350	9.0	LOS A	2.0	14.5	0.73	0.73	46.8
All Vehicles		3017	5.0	0.443	8.8	LOS A	3.7	27.4	0.68	0.68	47.0

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

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 used.

MOVEMENT SUMMARY

Site: Interim PM Peak -
Roundabout

Berwick-Cranbourne Rd Intersection
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Berwick-Cranbourne Rd S											
1	L	171	5.0	0.624	12.3	LOS B	7.8	56.8	0.97	0.98	45.8
2	T	798	5.0	0.624	12.0	LOS B	7.8	56.8	0.97	1.01	44.8
3	R	199	5.0	0.624	21.0	LOS C	6.8	49.8	0.96	1.09	40.5
Approach		1167	5.0	0.624	13.6	LOS B	7.8	56.8	0.96	1.02	44.1
East: Thompsons Road E											
4	L	215	5.0	1.309	297.7	LOS F	112.2	818.9	1.00	5.60	6.5
5	T	141	5.0	1.309	296.7	LOS F	112.2	818.9	1.00	5.60	6.6
6	R	328	5.0	1.309	304.1	LOS F	112.2	818.9	1.00	5.60	7.0
Approach		684	5.0	1.309	300.6	LOS F	112.2	818.9	1.00	5.60	6.8
North: Berwick-Cranbourne Rd S											
7	L	328	5.0	0.674	8.8	LOS A	8.0	58.1	0.81	0.78	47.7
8	T	920	5.0	0.674	8.1	LOS A	8.0	58.1	0.82	0.79	47.0
9	R	421	5.0	0.674	16.7	LOS B	7.7	56.5	0.85	0.93	43.2
Approach		1669	5.0	0.674	10.4	LOS B	8.0	58.1	0.83	0.82	46.0
West: Thompsons Road W											
10	L	398	5.0	0.500	9.8	LOS A	3.6	25.9	0.88	0.91	46.6
11	T	140	5.0	0.500	10.1	LOS B	3.1	22.9	0.86	0.96	46.2
12	R	112	5.0	0.500	17.5	LOS B	3.1	22.9	0.86	1.04	42.8
Approach		649	5.0	0.500	11.2	LOS B	3.6	25.9	0.87	0.94	45.8
All Vehicles		4171	5.0	1.309	59.0	LOS E	112.2	818.9	0.90	1.68	23.3

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

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 used.

MOVEMENT SUMMARY

Site: Interim AM Peak -
Roundabout - Modified 60m RT

Berwick-Cranbourne Rd Intersection
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Berwick-Cranbourne Rd S											
1	L	91	5.0	0.483	8.5	LOS A	3.5	25.6	0.74	0.77	48.3
2	T	756	5.0	0.483	7.7	LOS A	3.5	25.6	0.74	0.73	48.0
3	R	81	5.0	0.483	15.6	LOS B	3.3	24.4	0.75	0.98	44.6
Approach		927	5.0	0.483	8.4	LOS A	3.5	25.6	0.74	0.76	47.7
East: Thompsons Road E											
4	L	89	5.0	0.170	7.8	LOS A	0.9	6.2	0.70	0.68	48.1
5	T	62	5.0	0.170	6.6	LOS A	0.9	6.2	0.70	0.60	48.0
6	R	123	5.0	0.187	15.0	LOS B	0.9	6.2	0.70	0.90	43.8
Approach		275	5.0	0.187	10.7	LOS B	0.9	6.2	0.70	0.76	46.0
North: Berwick-Cranbourne Rd S											
7	L	112	5.0	0.437	6.3	LOS A	3.4	25.0	0.53	0.55	49.5
8	T	638	5.0	0.437	5.1	LOS A	3.4	25.0	0.53	0.46	49.6
9	R	489	5.0	0.437	12.9	LOS B	3.2	23.7	0.56	0.71	44.8
Approach		1239	5.0	0.437	8.2	LOS A	3.4	25.0	0.54	0.57	47.5
West: Thompsons Road W											
10	L	394	5.0	0.340	7.6	LOS A	1.9	13.6	0.71	0.67	47.7
11	T	64	5.0	0.340	7.0	LOS A	1.7	12.6	0.71	0.65	47.2
12	R	118	5.0	0.340	14.4	LOS B	1.7	12.6	0.71	0.95	44.9
Approach		576	5.0	0.340	8.9	LOS A	1.9	13.6	0.71	0.72	47.0
All Vehicles		3017	5.0	0.483	8.7	LOS A	3.5	25.6	0.65	0.67	47.3

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

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 used.

MOVEMENT SUMMARY

Site: Interim PM Peak -
Roundabout - Modified 60m RT

Berwick-Cranbourne Rd Intersection
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow 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: Berwick-Cranbourne Rd S											
1	L	171	5.0	0.702	12.9	LOS B	7.5	55.1	0.91	1.11	45.2
2	T	798	5.0	0.702	12.3	LOS B	7.5	55.1	0.91	1.09	44.6
3	R	199	5.0	0.702	20.7	LOS C	6.8	49.6	0.91	1.15	40.6
Approach		1167	5.0	0.702	13.8	LOS B	7.5	55.1	0.91	1.10	43.9
East: Thompsons Road E											
4	L	215	5.0	0.512	10.3	LOS B	3.6	26.1	0.90	0.97	47.0
5	T	141	5.0	0.512	9.1	LOS A	3.6	26.1	0.90	0.89	46.5
6	R	328	5.0	0.662	20.9	LOS C	4.6	33.8	0.91	1.09	39.6
Approach		684	5.0	0.662	15.1	LOS B	4.6	33.8	0.90	1.01	42.9
North: Berwick-Cranbourne Rd S											
7	L	328	5.0	0.674	8.8	LOS A	8.0	58.3	0.81	0.79	47.7
8	T	920	5.0	0.674	8.1	LOS A	8.0	58.3	0.83	0.79	47.0
9	R	421	5.0	0.674	16.7	LOS B	7.8	56.6	0.85	0.93	43.2
Approach		1669	5.0	0.674	10.4	LOS B	8.0	58.3	0.83	0.82	46.0
West: Thompsons Road W											
10	L	398	5.0	0.516	10.8	LOS B	3.8	27.8	0.90	1.01	46.4
11	T	140	5.0	0.516	11.3	LOS B	3.3	24.3	0.87	0.98	45.0
12	R	112	5.0	0.516	18.7	LOS B	3.3	24.3	0.87	1.05	41.9
Approach		649	5.0	0.516	12.3	LOS B	3.8	27.8	0.89	1.01	45.2
All Vehicles		4171	5.0	0.702	12.4	LOS B	8.0	58.3	0.87	0.96	44.7

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

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 used.

MOVEMENT SUMMARY

Site: Ultimate AM Peak - 30m
Short RT with 3% Linear growth

New Site
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Bells Rd S											
1	L	168	0.0	0.165	9.0	LOS A	0.7	4.6	0.28	0.65	47.7
3	R	1	0.0	0.165	9.3	LOS A	0.7	4.6	0.28	0.79	47.7
Approach		169	0.0	0.165	9.0	LOS A	0.7	4.6	0.28	0.65	47.7
East: Thompsons Rd E											
4	L	1	0.0	0.075	8.2	LOS A	0.0	0.0	0.00	1.09	49.0
5	T	145	0.0	0.075	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		146	0.0	0.075	0.1	NA	0.0	0.0	0.00	0.01	59.9
West: Thompsons Rd W											
11	T	123	0.0	0.063	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R	160	0.0	0.156	9.1	LOS A	0.5	3.8	0.27	0.66	47.6
Approach		283	0.0	0.156	5.1	NA	0.5	3.8	0.15	0.37	52.3
All Vehicles		599	0.0	0.165	5.0	NA	0.7	4.6	0.15	0.36	52.5

Level of Service (LOS) Method: Delay (HCM 2000).

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 used.

Processed: Monday, 23 September 2013 11:31:54 AM
SIDRA INTERSECTION 5.1.13.2093
Project: P:\13M2100-2199\13M2191000 1425 Pound Road, Clyde North\Modelling\130923sid-13M2191000
Thompsons Road_Bells with Retirement.sip
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SIDRA
INTERSECTION

MOVEMENT SUMMARY

Site: Ultimate PM Peak - 30m
Short RT with 3% Linear growth

New Site
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Bells Rd S											
1	L	474	0.0	0.508	10.9	LOS B	3.7	26.2	0.49	0.78	46.1
3	R	1	0.0	0.508	11.2	LOS B	3.7	26.2	0.49	0.90	46.0
Approach		475	0.0	0.508	10.9	LOS B	3.7	26.2	0.49	0.78	46.1
East: Thompsons Rd E											
4	L	1	0.0	0.116	8.2	LOS A	0.0	0.0	0.00	1.09	49.0
5	T	225	0.0	0.116	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		226	0.0	0.116	0.0	NA	0.0	0.0	0.00	0.01	59.9
West: Thompsons Rd W											
11	T	227	0.0	0.117	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R	467	0.0	0.461	10.2	LOS B	2.6	18.3	0.44	0.73	46.8
Approach		695	0.0	0.461	6.9	NA	2.6	18.3	0.29	0.49	50.4
All Vehicles		1396	0.0	0.508	7.1	NA	3.7	26.2	0.31	0.51	50.1

Level of Service (LOS) Method: Delay (HCM 2000).

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 used.

Processed: Monday, 23 September 2013 11:31:54 AM
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SIDRA
INTERSECTION

MOVEMENT SUMMARY

Site: Ultimate AM Peak - 30m
Short RT with 3% Linear growth

New Site
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Site Access S											
1	L	77	0.0	0.070	8.5	LOS A	0.3	1.8	0.17	0.62	48.2
3	R	1	0.0	0.070	8.8	LOS A	0.3	1.8	0.17	0.72	48.0
Approach		78	0.0	0.070	8.5	LOS A	0.3	1.8	0.17	0.62	48.2
East: Thompsons Rd E											
4	L	1	0.0	0.036	8.2	LOS A	0.0	0.0	0.00	1.08	49.0
5	T	68	0.0	0.036	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		69	0.0	0.036	0.1	NA	0.0	0.0	0.00	0.02	59.8
West: Thompsons Rd W											
11	T	68	0.0	0.035	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R	55	0.0	0.053	8.7	LOS A	0.2	1.1	0.16	0.65	48.0
Approach		123	0.0	0.053	3.9	NA	0.2	1.1	0.07	0.29	54.0
All Vehicles		271	0.0	0.070	4.2	NA	0.3	1.8	0.08	0.31	53.5

Level of Service (LOS) Method: Delay (HCM 2000).

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 used.

MOVEMENT SUMMARY

Site: Ultimate PM Peak - 30m
Short RT with 3% Linear growth

New Site
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Site Access S											
1	L	157	0.0	0.142	8.6	LOS A	0.6	3.9	0.18	0.63	48.2
3	R	1	0.0	0.142	8.8	LOS A	0.6	3.9	0.18	0.75	48.0
Approach		158	0.0	0.142	8.6	LOS A	0.6	3.9	0.18	0.63	48.2
East: Thompsons Rd E											
4	L	1	0.0	0.036	8.2	LOS A	0.0	0.0	0.00	1.08	49.0
5	T	68	0.0	0.036	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		69	0.0	0.036	0.1	NA	0.0	0.0	0.00	0.02	59.8
West: Thompsons Rd W											
11	T	68	0.0	0.035	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R	159	0.0	0.152	8.7	LOS A	0.5	3.5	0.17	0.65	47.9
Approach		227	0.0	0.152	6.1	NA	0.5	3.5	0.12	0.45	51.0
All Vehicles		455	0.0	0.152	6.0	NA	0.6	3.9	0.12	0.45	51.1

Level of Service (LOS) Method: Delay (HCM 2000).

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 used.

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