



St Germain Special Activity  
Precinct

1425 Pound Road & 2100  
Thompsons Road

Clyde North

Transport Impact Assessment

draft

transportation planning, design and delivery

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

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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. The wider superblock (the area surrounding Stage 1) is to be developed in a staged manner over the next 30 years.

**Table 1.1: Development Schedule**

Description	Stage	Use	Size
Medical Precinct (Lot A)	Stage 1	Medical	7,850 m <sup>2</sup>
		Pharmacy	350 m <sup>2</sup>
North-East Precinct (Lot B)	Stage 1	Supermarket	4,000 m <sup>2</sup>
		Retail / speciality shops / café	1,840 m <sup>2</sup>
	Future stage	Mini major	1,550 m <sup>2</sup>
		Retail / speciality shops	140 m <sup>2</sup>
		Restaurant	450 m <sup>2</sup>
		Tavern	750 m <sup>2</sup>
South East Precinct (Lot C)	Stage 1	Retail / café	760 m <sup>2</sup>
		Apartments	34 x 2 bedroom + 2 x Penthouses
	Future stage	Community Activity Centre	1,000 m <sup>2</sup>
		Gymnasium	1,000 m <sup>2</sup>
		Child care	120 children
South West Precinct (Lot D)	Stage 1	Office	1,770 m <sup>2</sup>
		Retail	240 m <sup>2</sup>
	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 across the site in excess of the statutory requirements.

Pedestrian paths have been provided across the subject site to provide a high level of access for pedestrians. 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 is to be highly pedestrianized 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 (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.

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 in a garage) provided on each individual plot for retirement village dwellings. Assume only two are used for three bedroom dwellings.

The development 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 hence providing a direct connection to the surrounding arterial road network via Thompsons Road.

### 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 (Lots A through D). A further link will be provided which involves the construction of a length of the future north-south road 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:

- Future north-south Road (known as Bells Road) / Thompsons Road – unsignalised T-intersection.
- Midblock on Thompsons Road between Soldiers Road (existing) and Bells Road – left in / left out.
- Bells Road left in / left out south of Thompsons Road.

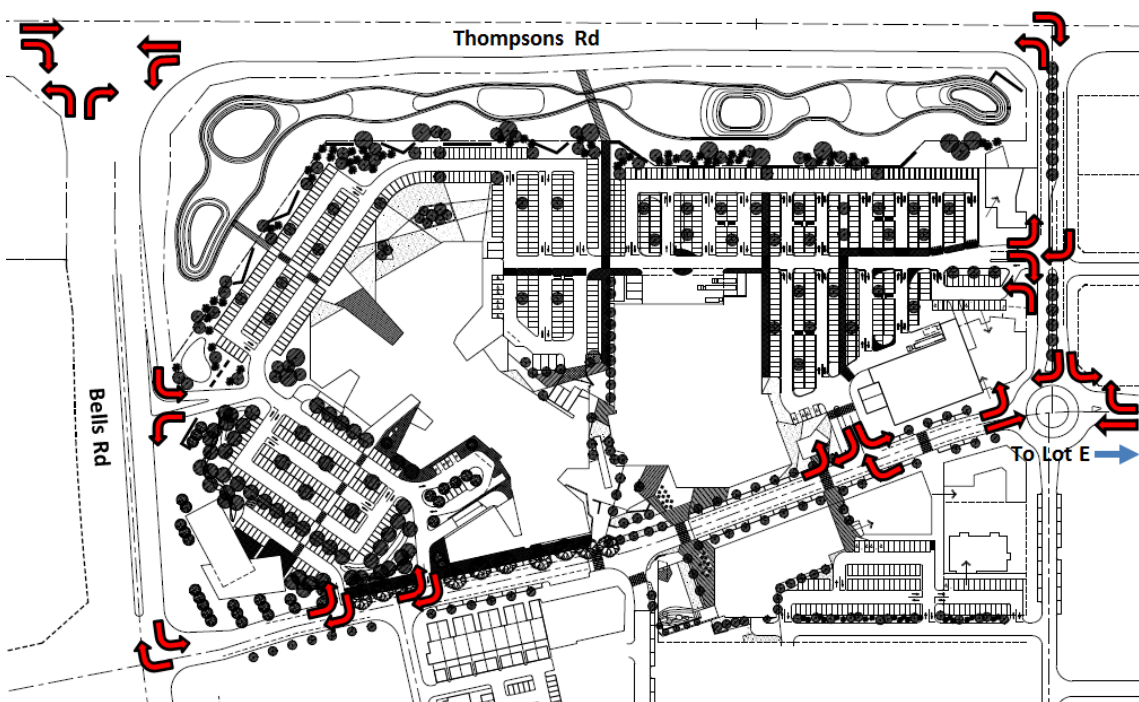
Figure 1.1 and Figure 1.2 has been prepared to outline the interim access arrangement to service the initial stages of the development.



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:

- Future north-south Road (known as 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 left in / left out – service road arrangement.
- Midblock via new east-west Main Street on Bells Road between Hardys Road and Thompsons Road – signalised intersection.
- Bells Road left in / left out between Thompsons Road and Hardys Road.

## 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 900m to Thompsons Road and 320m to a future road which will connect with the existing Pound Road to the south and will be known as Bells Road. 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 to the west of the subject site.

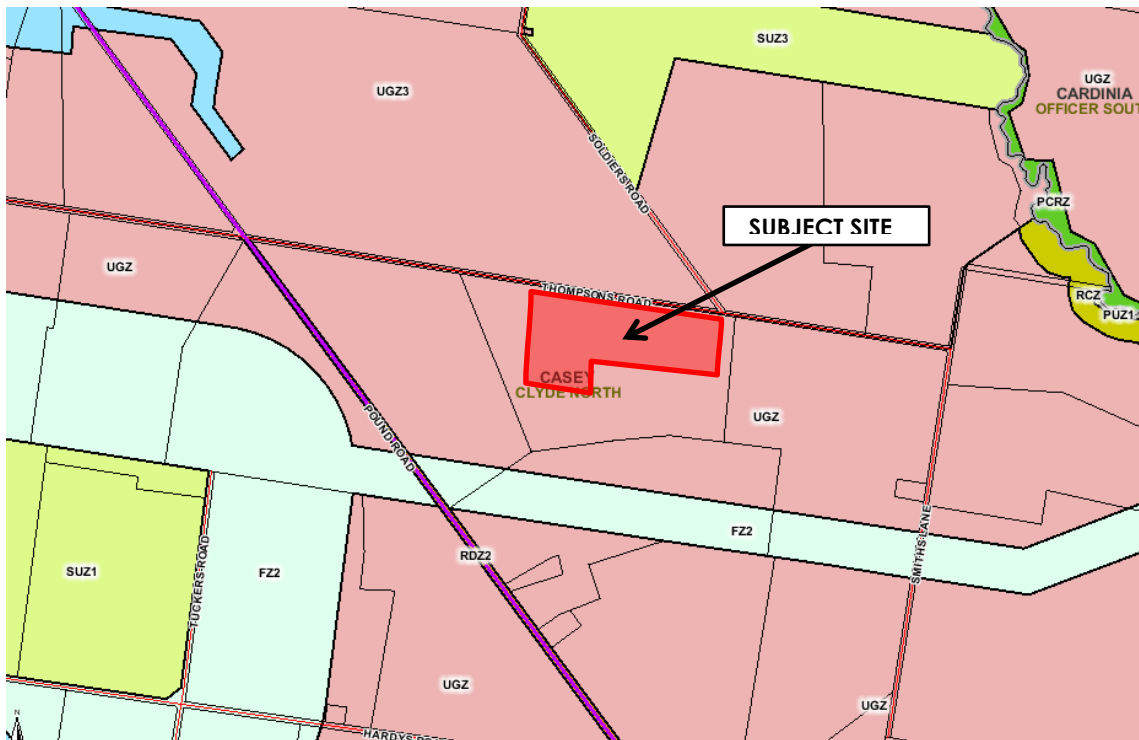
The location of the subject site and the surrounding environs is shown in Figure 1.3, and the land zoning is shown in Figure 1.4.



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 the proposed development, including consideration of the:

- i the adequacy of the proposed pedestrian, bicycle and public transport access arrangements to the site
- ii the adequacy of the proposed bicycle parking arrangements in terms of supply (quantum) and layout
- iii the adequacy of the proposed car parking provision
- iv the adequacy of the proposed car park layout
- v the adequacy of the proposed arrangements for loading and waste collection
- vi 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
- an inspection of the site and its surrounds
- 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.

### 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:

- 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.
- To promote the use of sustainable personal transport.
- To 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 guidance prepared by 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. There are on-road cycle lanes proposed along the internal local roads. End of trip cycle facilities are provided and it is expected that the site will be connected to the principal bicycle route once it is extended to the area.

The proposed development as it is ultimately proposed is a prime 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 relate to 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.

### 3.3 Bicycle Parking & Associated Facilities

#### 3.3.1 Overview

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	350sqm	NS	NS	-	-
North-East Precinct Stage 1	Supermarket	4,000sqm	NS	NS	-	-
	Retail/ Specialty Shops/ Café	1,840sqm	1 space per 300sqm	1 space per 500sqm	6 spaces	4 spaces
North-East Precinct Future Stage	Mini Major	1,550sqm	NS	NS	-	-
	Retail/ Specialty Shops	140sqm	1 space per 300sqm	1 space per 500sqm	0 spaces	0 spaces
	Restaurant	450sqm	1 space per 100sqm	2 plus 1 space per 200sqm if NFA exceeds 400sqm	5 spaces	4 spaces
	Tavern	750sqm	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	760sqm	1 space per 300sqm	1 space per 500sqm	3 spaces	2 spaces
South-East Precinct Future Stage	Community Activity Centre	1,000sqm	1 space per 1,500sqm	2 plus 1 space per 1,500sqm	1 space	3 spaces
	Gym	1,000sqm	NS	NS	-	-
	Child Care Centre	120sqm	NS	NS	-	-
South-West Precinct Stage 1	Offices	1,770sqm	1 space per 300sqm if NFA exceeds 1,000sqm	1 space per 1,000sqm if NFA exceeds 1,000sqm	6 spaces	2 spaces
	Wine Bar	240sqm	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	-	-
<b>Total</b>					<b>36 spaces</b>	<b>33 spaces</b>

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 fit 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 each precinct for staff of the medical precinct and the uses within each of the other three precincts. To encourage bicycle travel at least 8-10 employee spaces per precinct is recommended.

### 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.

## 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 10 bicycle spaces per precinct indicates that the proposal has a statutory requirement of two change rooms/showers per precinct. This provision could be centralised if this was deemed to be a more effective use of space.

### 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 4 change rooms/showers 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.



## 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 <sup>2</sup> 60 practitioners [1]	3 spaces per person providing health services [2]	182 spaces
		Pharmacy (Shop)	350 m <sup>2</sup>	4 spaces per 100 m <sup>2</sup> of leasable floor area	14 spaces
North Precinct	Stage 1	Supermarket	4,000 m <sup>2</sup>	5 spaces per 100 m <sup>2</sup> of leasable floor area	200 spaces
		Retail / speciality shops / café	1,840 m <sup>2</sup>	4 spaces per 100 m <sup>2</sup> of leasable floor area	73 spaces
	Future	Mini major	1,550 m <sup>2</sup>	4 spaces per 100 m <sup>2</sup> of leasable floor area	62 spaces
		Retail / speciality shops	140 m <sup>2</sup>	4 spaces per 100 m <sup>2</sup> of leasable floor area	5 spaces
		Restaurant	450 m <sup>2</sup> (150 patrons) [3]	0.4 spaces per patron	60 spaces
		Tavern	750 m <sup>2</sup> (200 patrons) [3]	0.4 spaces per patron	80 spaces
South East Precinct	Stage 1	Retail / café	760 m <sup>2</sup>	4 spaces per 100 m <sup>2</sup> 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 <sup>2</sup>	Not specified (NS)	-
		Gymnasium	1,000 m <sup>2</sup>	Not specified (NS)	-
		Child care	120 children	0.22 spaces per child	26 spaces
South West Precinct	Stage 1	Office	1,770 m <sup>2</sup>	3.5 spaces per 100 m <sup>2</sup> of net floor area)	61 spaces
		Retail	240 m <sup>2</sup>	4 spaces per 100 m <sup>2</sup> 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
<b>Stage 1</b>					<b>960 spaces</b>
<b>Future stages</b>					<b>240 spaces</b>
<b>Total</b>					<b>1,200 spaces</b>

[1] Estimated number of practitioners [2] 5 spaces for the first practitioner [3] Assuming 1 patron per 3 m<sup>2</sup>

[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 to be provided.

## 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
	<b>Total</b>	<b>960</b>	<b>1,364</b>
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
	<b>Total</b>	<b>240</b>	<b>223</b>
Overall	Medical	196	580
	North-East	480	386
	South-West	77	77
	South-East	101	133
	On-street	-	63
	Retirement village	346	348
	<b>Total</b>	<b>1,200</b>	<b>1,587</b>

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, with a full assessment provided in Appendix C.

### 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
  - Stage 2: 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
  - Stage 2: 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 E.

### 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 of the development proposes to construct the land uses set out in Table 7.1, with remaining land to be developed as part of future stages of the development. 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**

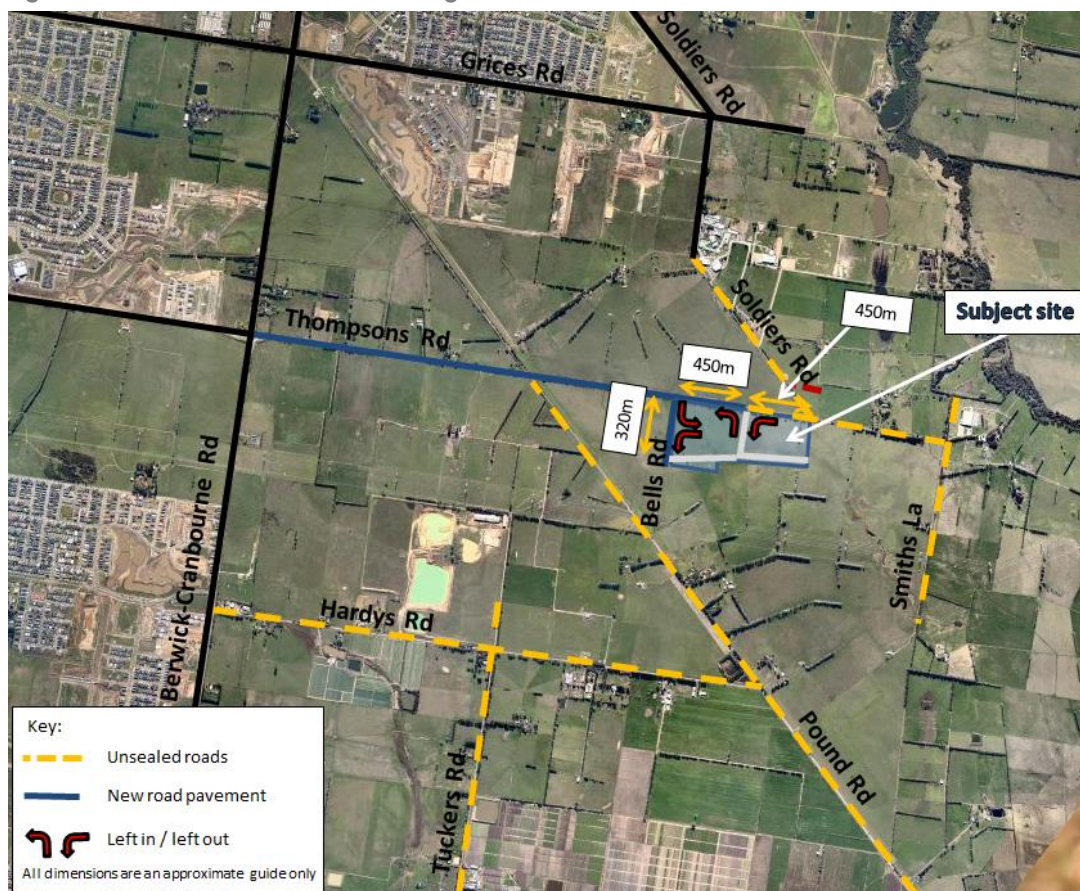
Precincts	Land Uses	Size
Medical Precinct (Lot A)	Medical	7,850 m <sup>2</sup>
	Pharmacy	350 m <sup>2</sup>
North-East Precinct (Lot B)	Supermarket	4,000 m <sup>2</sup>
	Retail / speciality shops / café	1,840 m <sup>2</sup>
South East Precinct (Lot C)	Retail / café	760 m <sup>2</sup>
	Apartments	34 x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

On this basis, 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 F, 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.

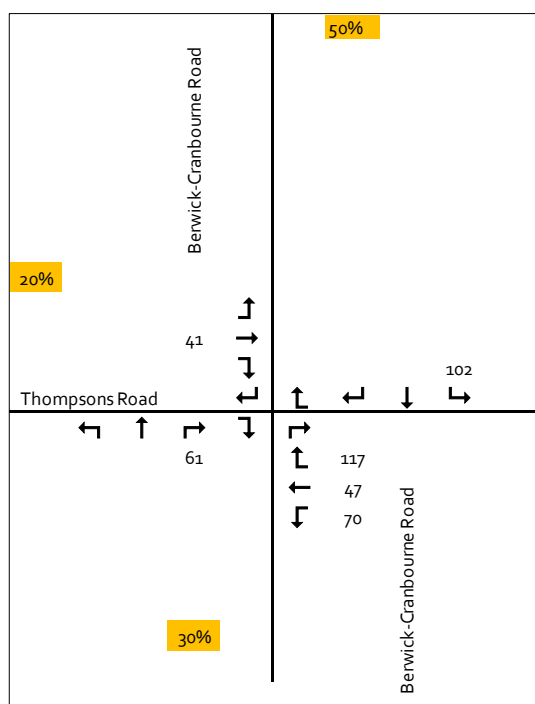
For the purposes of this assessment, as outlined in Section 7.2.1, that in the interim period the proposed development will be accessed via Thompsons Road only. The following directional distributions of the site generated traffic have therefore been adopted at the intersection of Berwick-Cranbourne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

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

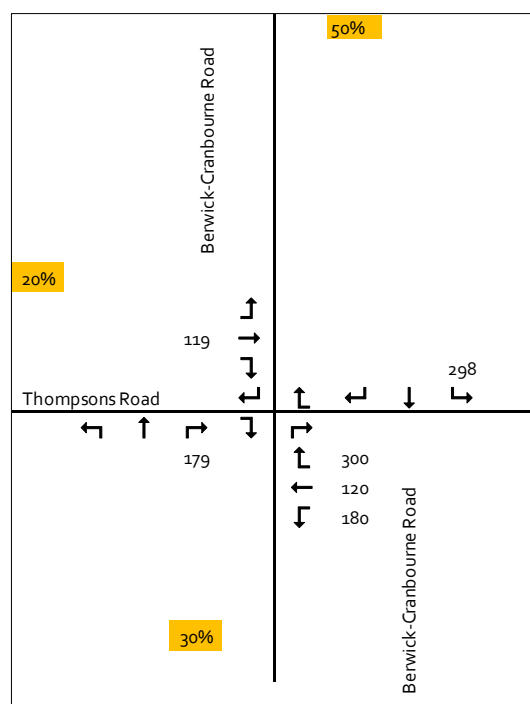
In addition, the directional split of traffic (i.e. the ratio between the inbound and outbound traffic movements) are further distributed in accordance with the estimated in/out splits anticipated for each land use. This detail is shown in Appendix F.

Based on the above, Figure 7.2 and Figure 7.3 have been prepared to show the estimated increase in turning movements 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 (DPTI) is not available for use.

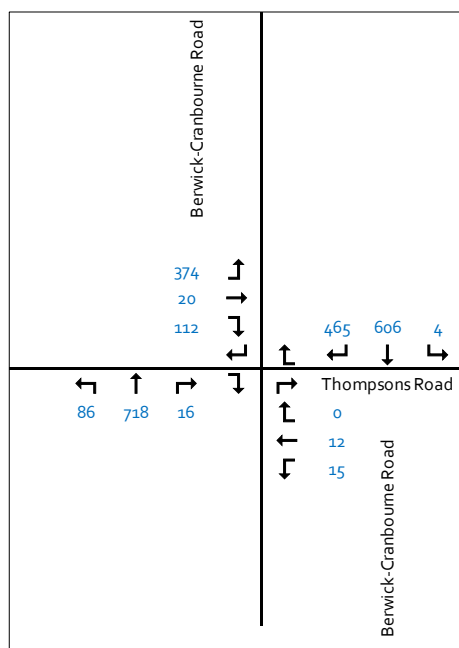
## 7.5.2 Existing Conditions

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

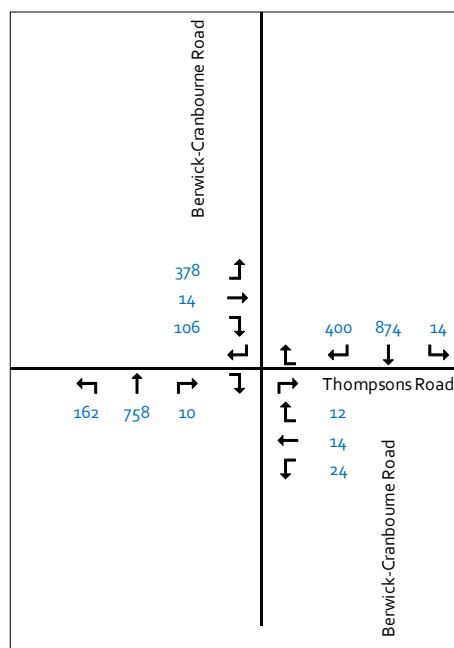
- Friday 13 September 2013 AM Peak 8:00am - 9:00am
- Thursday 12 September 2013 PM Peak 5:00pm - 6:00pm.

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*<sup>1</sup>, a computer based modelling package which calculates intersection performance.

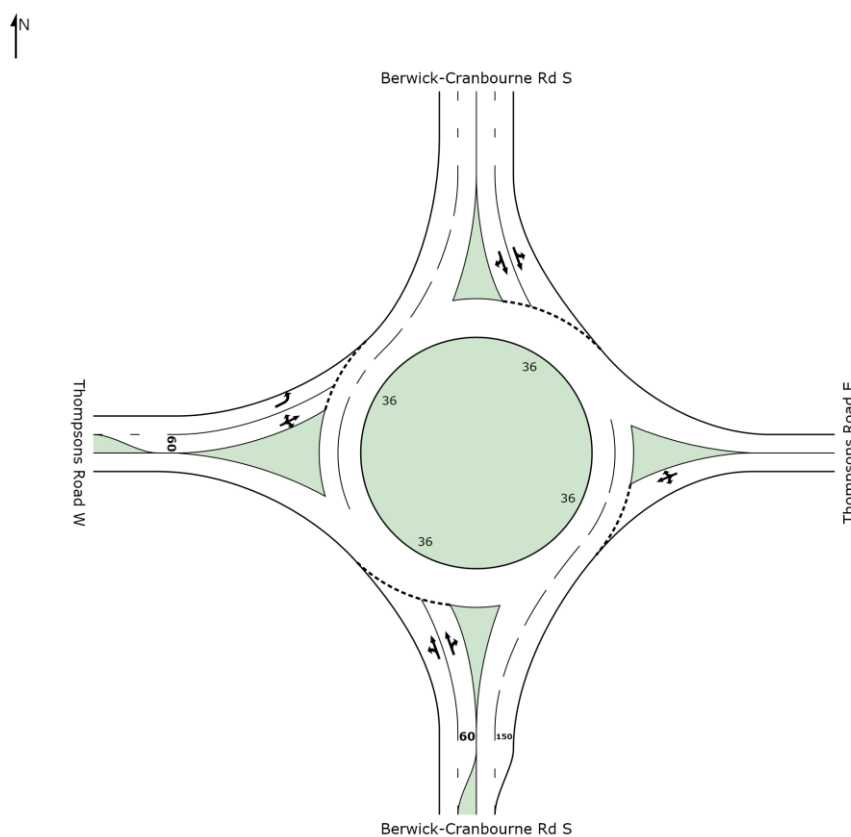
The commonly used measure of intersection performance is referred to as the *Degree of Saturation (DOS)*. The DOS represents the flow-to-capacity ratio for the most critical movement on each leg of the intersection. For unsignalised intersections, a DOS of around 0.90 has been

<sup>1</sup> Program used under license from Akcelik & Associates Pty Ltd.

typically considered the 'ideal' limit, beyond which queues and delays increase disproportionately<sup>2</sup>.

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 G of this report.

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



<sup>2</sup> 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: Berwick-Cranbourne Road / Thompsons Road – Existing Unsignalised Intersection Operation**

Approach	DOS		Average Delay (sec)		95 <sup>th</sup> 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

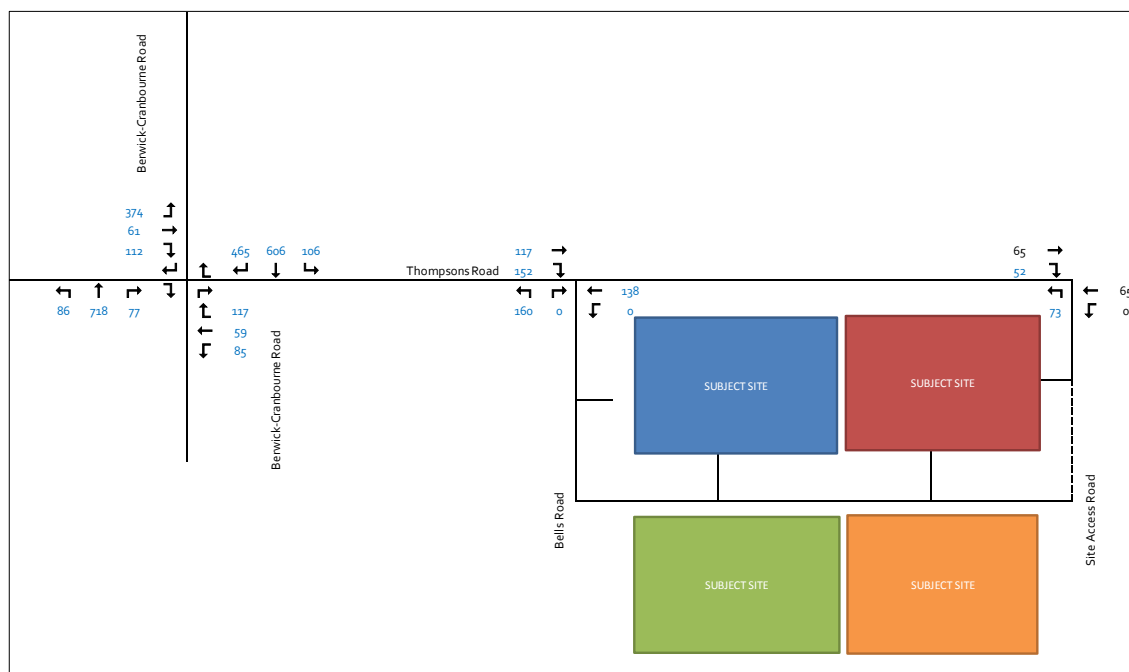
DOS – Degree of Saturation, # - Intersection DOS

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

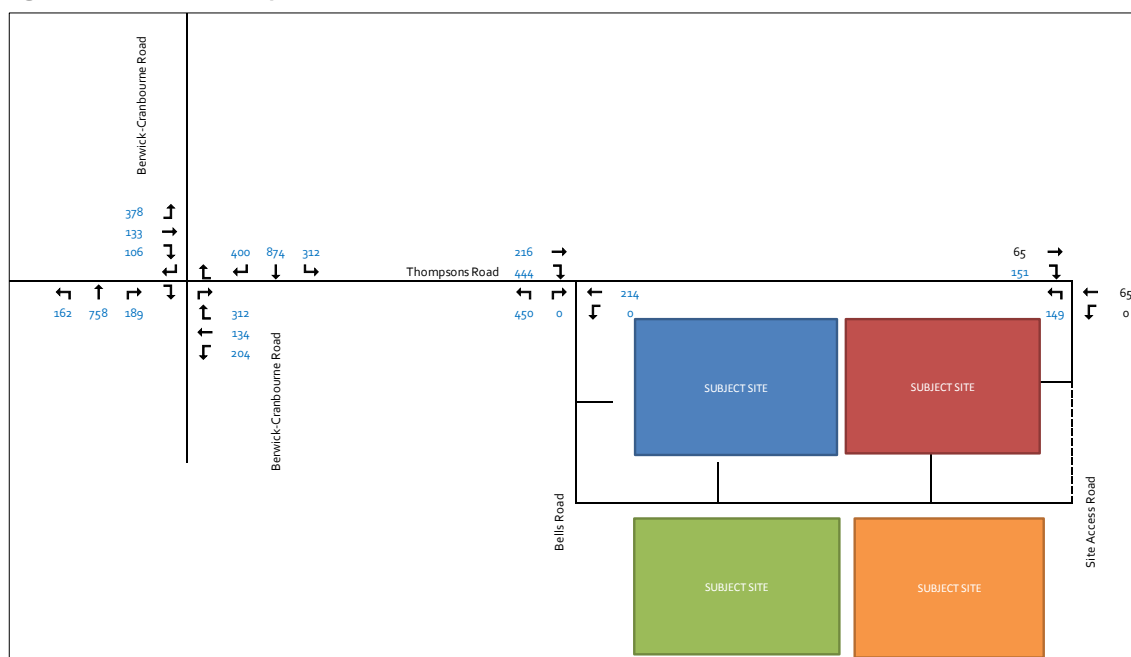
#### Post Development Traffic Volumes

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 assessment<sup>3</sup>, it has been assumed an additional 50 vehicles per hour will travel east-west through the intersection of Berwick-Cranbourne Road and 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**


<sup>3</sup> 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. 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 G.

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

Approach	DOS		Average Delay (sec)		95 <sup>th</sup> 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 model which 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 significantly deteriorate and operate well



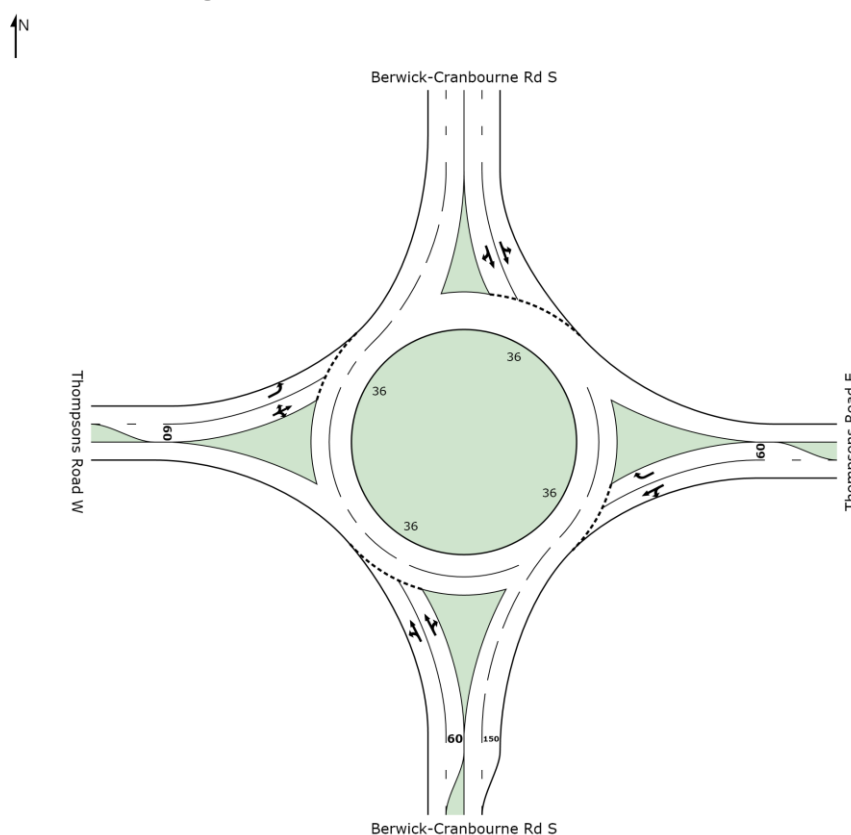
above its theoretical limit during the PM peak hour. In particular, it is noted that traffic on the eastern approach (Thompsons Road) is likely to experience significant delays and queues.

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 G.

**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 <sup>th</sup> 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**

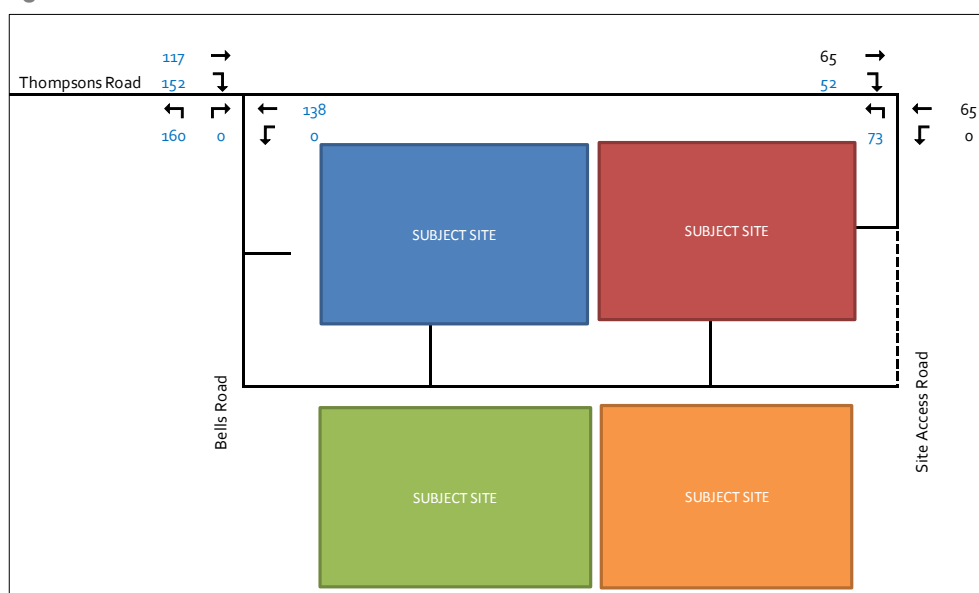
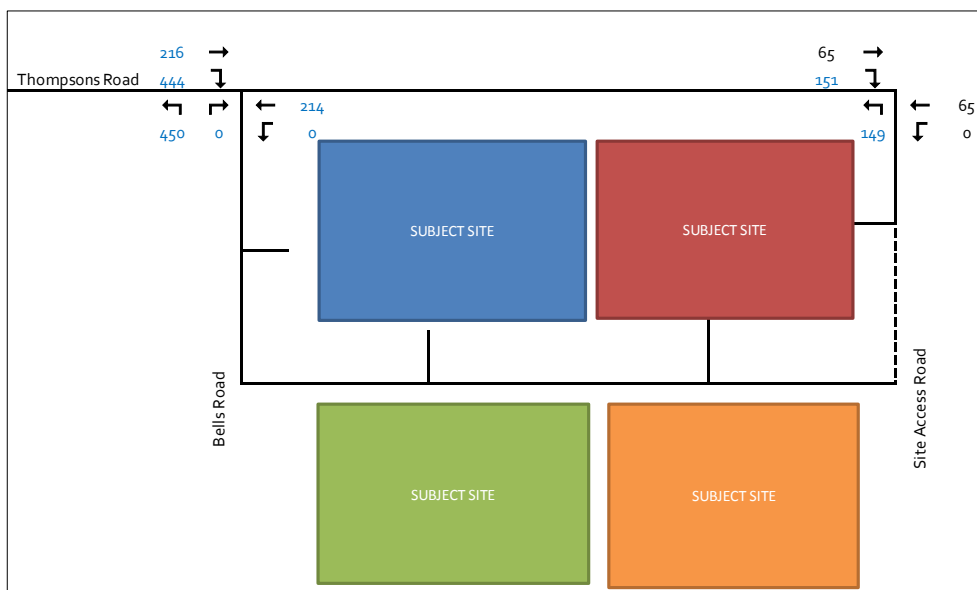
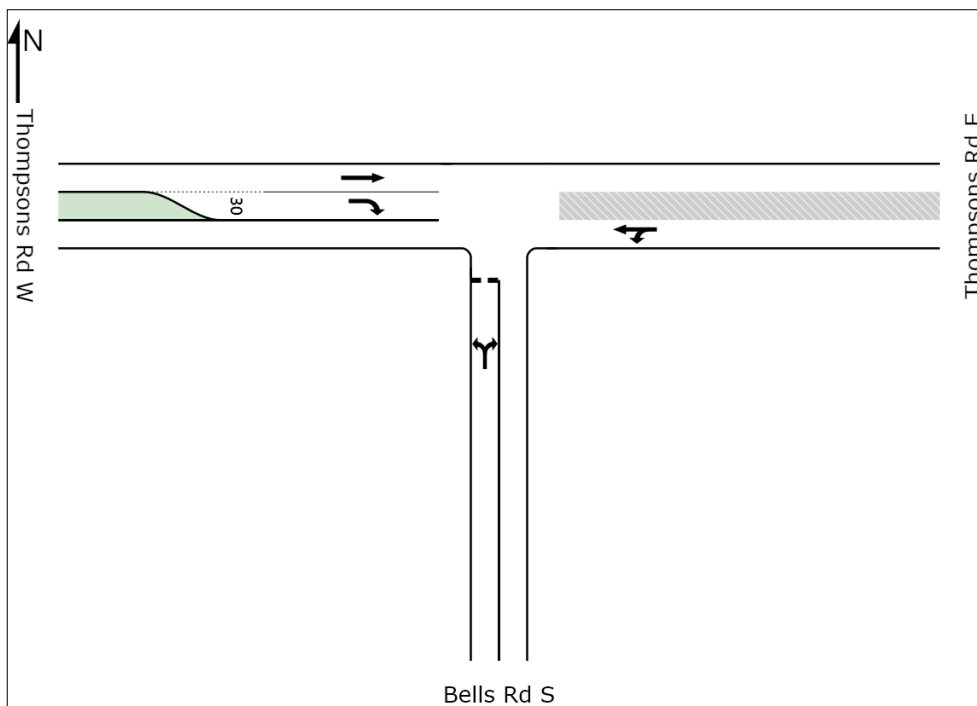


Figure 7.11: Year 2013 PM Peak Traffic Volumes with Site Traffic – New Access Points



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 G.

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 <sup>th</sup> 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

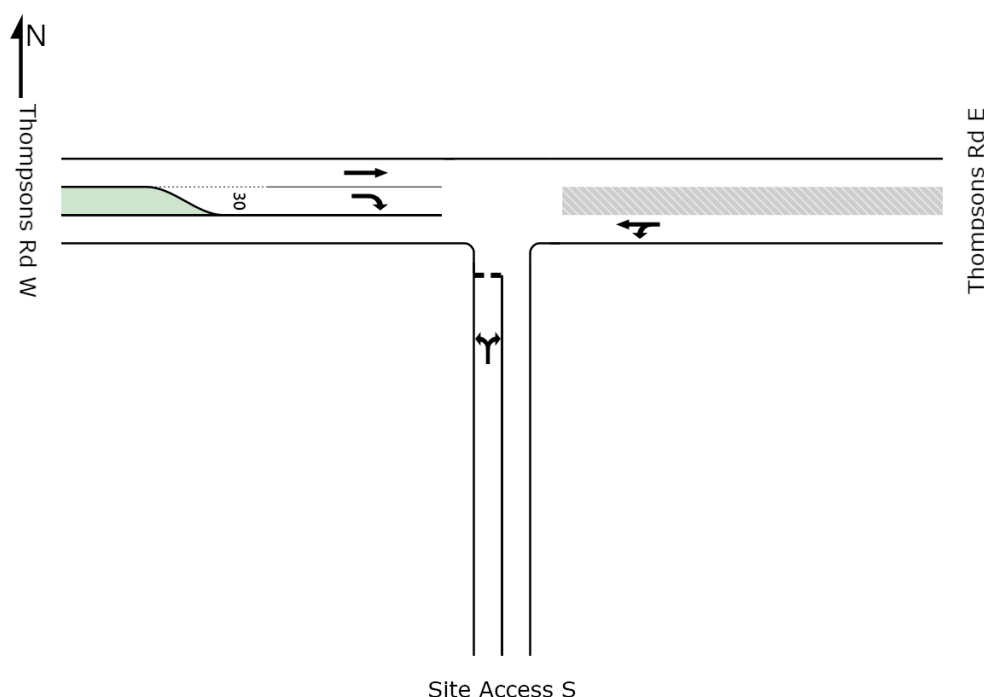
DOS – Degree of Saturation, # - Intersection DOS

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 G.

**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 <sup>th</sup> 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 1,200 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

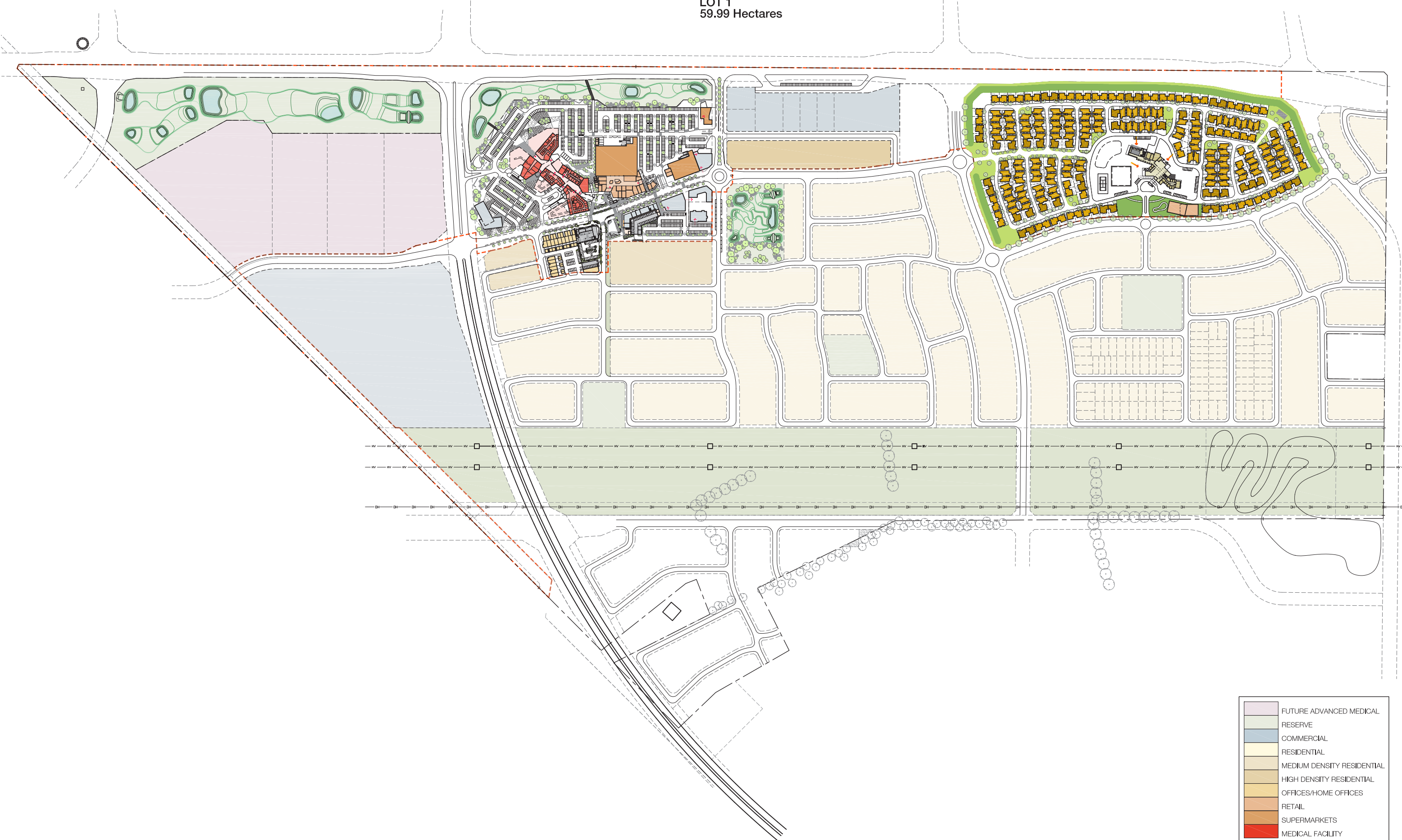
- Appropriate basic unsignalised intersection treatments (including a 30m right turn lane on the west approach) at the following locations:
  - Thompsons Road / Future Bells Road
  - Thompsons Road / new north south road.
- viii Provision is made for all access arrangements to operate safely and efficiently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



## Appendix A

### 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

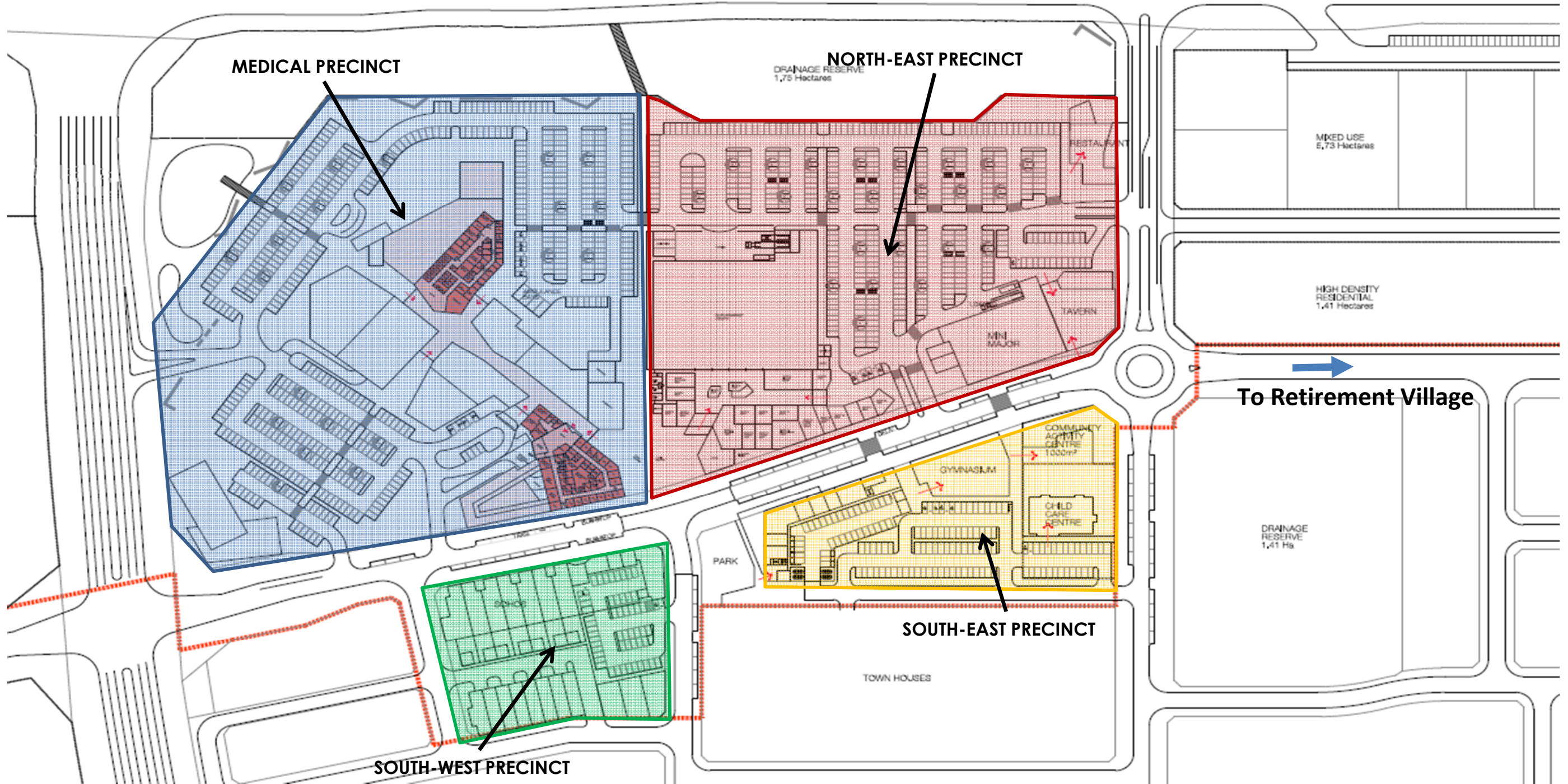
To Retirement Village

DRAINAGE  
RESERVE  
1.41 Hs

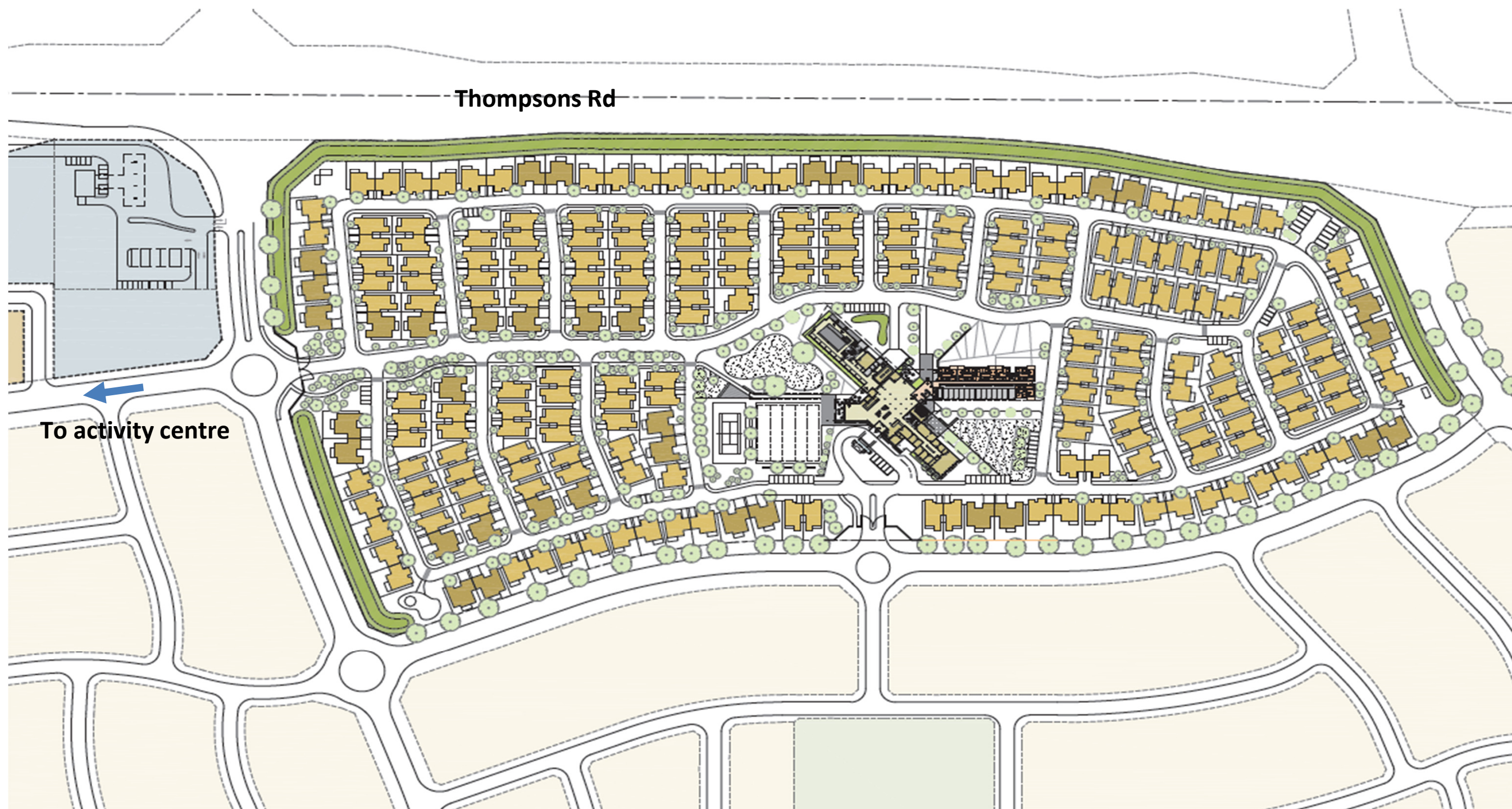
SOUTH-EAST PRECINCT

TOWN HOUSES

SOUTH-WEST PRECINCT







## 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.

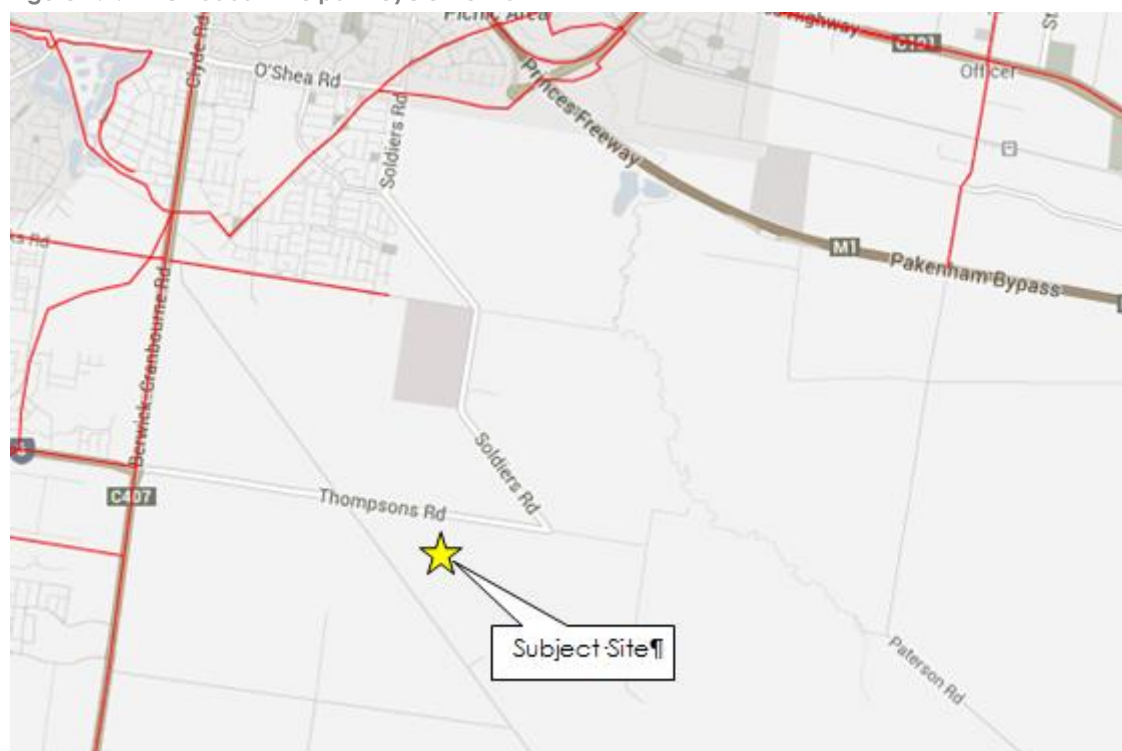
## B.2.3 Cycle Infrastructure

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:

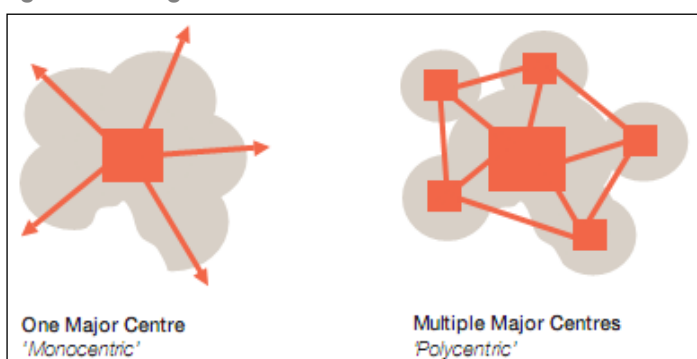
- *"Provide for the forecast increase in population and households"*
- *Ensure the available housing stock better matches changing demand by widening housing choice, particularly in middle and outer suburbs*
- *Support opportunities for a wide range of income groups to choose housing in well serviced 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

### Car Park Design Standards Assessment

**Design Standard 1 – Accessways**

Standard	Compliant
Accessways must:	
<ul style="list-style-type: none"> <li>Be at least 3 metres wide.</li> </ul>	
<ul style="list-style-type: none"> <li>Have an internal radius of at least 4 metres at changes of direction or intersection or be at least 4.2 metres wide.</li> </ul>	
<ul style="list-style-type: none"> <li>Allow vehicles parked in the last space of a dead-end accessway in public car parks to exit in a forward direction with one manoeuvre.</li> </ul>	
<ul style="list-style-type: none"> <li>Provide at least 2.1 metres headroom beneath overhead obstructions, calculated for a vehicle with a wheel base of 2.8 metres.</li> </ul>	
<ul style="list-style-type: none"> <li>If the accessway serves four or more car spaces or connects to a road in a Road Zone, the accessway must be designed so that cars can exit the site in a forward direction.</li> </ul>	
<ul style="list-style-type: none"> <li>Provide a passing area at the entrance at least 5 metres wide and 7 metres long if the accessway serves ten or more car parking spaces and is either more than 50 metres long or connects to a road in a Road Zone.</li> </ul>	
<ul style="list-style-type: none"> <li>Have a corner splay or area at least 50 per cent clear of visual obstructions extending at least 2 metres along the frontage road from the edge of an exit lane and 2.5 metres along the exit lane from the frontage, to provide a clear view of pedestrians on the footpath of the frontage road. The area clear of visual obstructions may include an adjacent entry or exit lane where more than one lane is provided, or adjacent landscaped areas, provided the landscaping in those areas is less than 900mm in height.</li> </ul>	
If an accessway to four or more car parking spaces is from land in a Road Zone, the access to the car spaces must be at least 6 metres from the road carriageway.	
If entry to the car space is from a road, the width of the accessway may include the road.	

**Design Standard 2 – Car Parking Spaces**

Standard	Compliant
Car parking spaces and accessways must have the minimum dimensions in Table 2 of the Clause.	
<p>A wall, fence, column, tree, tree guard or any other structure that abuts a car space must not encroach into the area marked 'clearance required' on Diagram 1 other than:</p> <ul style="list-style-type: none"> <li>A column, tree or tree guard, which may project into a space if it is within the area marked 'tree or column permitted' on Diagram 1 of the design standard.</li> <li>A structure, which may project into the space if it is at least 2.1 metres above the space.</li> </ul>	
Car spaces in garages or carports must be at least 6 metres long and 3.5 metres wide for a single space and 5.5 metres wide for a double space measured inside the garage or carport.	
Where parking spaces are provided in tandem (one space behind the other) an additional 500 mm in length must be provided between each space.	
Where two or more car parking spaces are provided for a dwelling, at least one space must be under cover.	
Disabled car parking spaces must be designed in accordance with AS 2890.6-2009 (disabled) and the Building Code of Australia. Disabled car parking spaces may encroach into an accessway width specified in Table 2 by 500mm.	

**Design Standard 3: Gradients**

Standard	Compliant
Accessway grades must not be steeper than 1:10 (10 per cent) within 5 metres of the frontage to ensure safety for pedestrians and vehicles. This does not apply to accessways serving three dwellings or less.	
Ramps (except within 5 metres of the frontage) must have the maximum grades as outlined in Table 3 of the design standard and be designed for vehicles travelling in a forward direction.	
Where the difference in grade between two sections of ramp or floor is greater than 1:8 (12.5 per cent) for a summit grade change, or greater than 1:6.7 (15 per cent) for a sag grade change, the ramp must include a transition section of at least 2 metres to prevent vehicles scraping or bottoming.	
Plans must include an assessment of grade changes of greater than 1:5.6 (18 per cent) or less than 3 metres apart for clearances.	

**Design Standard 4: Mechanical Parking**

Standard	Compliant
At least 25% of the mechanical car parking spaces can accommodate a vehicle clearance height of at least 1.8 metres	
Car parking spaces that require the operation of the system are not allocated to visitors unless used in a valet parking situation	
The design and operation is to the satisfaction of the responsible authority	

**Design Standard 5: Urban Design**

Standard	Compliant
Ground level car parking, garage doors and accessways must not visually dominate public space.	
Car parking within buildings (including visible portions of partly submerged basements) must be screened or obscured where possible, including through the use of occupied tenancies, landscaping, architectural treatments and artworks.	
Design of car parks must take into account their use as entry points to the site.	
Design of new internal streets in developments must maximise on street parking opportunities.	

**Design Standard 6: Safety**

Standard	Compliant
Car parking must be well lit and clearly signed.	
The design of car parks must maximise natural surveillance and pedestrian visibility from adjacent buildings.	
Pedestrian access to car parking areas from the street must be convenient.	
Pedestrian routes through car parking areas and building entries and other destination points must be clearly marked and separated from traffic in high activity parking areas.	

**Design Standard 7: Landscaping**

Standard	Compliant
The layout of car parking areas must provide for water sensitive design treatment and landscaping.	
Landscaping and trees must be planted to provide shade and shelter, soften the appearance of ground level car parking and aid in the clear identification of pedestrian paths.	
Ground level car parking spaces must include trees planted with flush grilles. Spacing of trees must be determined having regard to the expected size of the selected species at maturity.	

## Appendix E

### Swept Paths

## Appendix F

### Traffic Generation

## F.1 Traffic Generation

### F.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.

Superlot/ Precinct	Stage	Use	Size	Unit	Traffic Generation Rate			Traffic Generation			AM		PM		Daily		AM		PM		Daily	
					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
		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
	2	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
		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
D	1	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
		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
	2	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
E		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
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 G

### SIDRA Intersection Results

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