Corner of Leakes Road and Davis Road

Section 96a Application, Riverdale PSP Area

Tarneit

Transport Impact Assessment

transportation planning, design and delivery

12M1845100 02/11/12

GTAconsultants

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Section 96a Application, Riverdale PSP Area, Tarneit

Transport Impact Assessment

Issue: A 02/11/12

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1. Introduction

A planning permit is currently being sought for a proposed residential subdivision on land located on the south-west corner of the intersection of Davis Road/Leakes Road in Tarneit under a Section 96a Application. The overall development of the site incorporates some 833 residential lots, 703 apartments and a Local Town Centre (LTC). This Section 96a application incorporates the development of 572 residential lots.

The Growth Areas Authority (GAA) is currently in the pre-planning stage of preparing a Precinct Structure Plan (PSP) for the precinct which will form an Amendment in the Wyndham Planning Scheme. The subject site is located within the draft Riverdale PSP area.

GTA Consultants was commissioned by Your Land Developments in September 2012 to undertake a Transport Impact Assessment of the proposal in line with the requirements of Clause 56 and the anticipated requirements of the PSP.

1.1 Purpose of this Report

This report sets out an assessment of the traffic and transport implications of the proposed development, including consideration of the:

i existing street network and traffic conditions surrounding the site
ii accessibility of the site by public transport and other non-vehicular modes of travel
iii road hierarchy within the subdivision
iv proposed access arrangements for the subdivision
v impact of the development on the surrounding road network.

1.2 References

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

- Wyndham Planning Scheme
- plans for the proposed development prepared by Taylors Development Strategists
- traffic surveys commissioned by GTA Consultants as referenced in the context of this report
- 'PSP Guidelines Notes – Our Roads: Connecting People' prepared by GAA
- various technical data as referenced in this report
- an inspection of the site and its surrounds
- other documents as nominated.

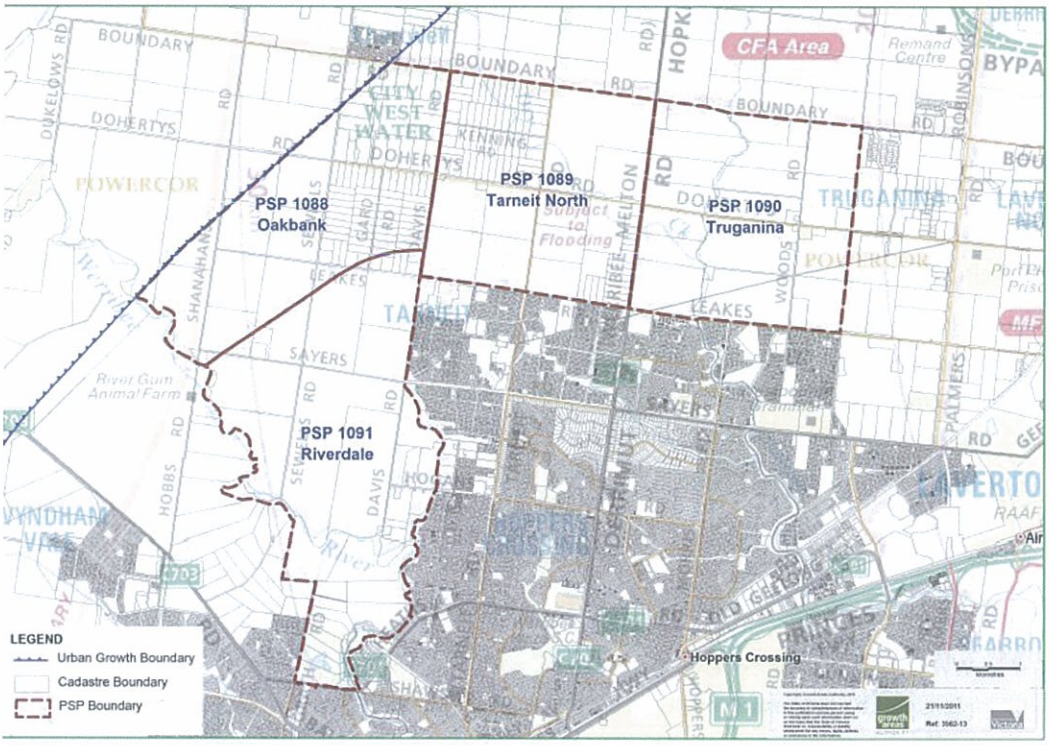
2. Existing Conditions

2.1 Site Location

2.1.1 The Riverdale PSP Area

The Riverdale PSP (PSP1091) is currently being prepared by the GAA. The location of the PSP in relation to the surrounding Wyndham North PSPs in the wider Melbourne West Growth Corridor is illustrated in Figure 2.1.

Figure 2.1: Riverdale PSP Location



2.1.2 Subject Site

The subject site is located on the south-west corner of the Leakes Road/Davis Road intersection in Tarneit. The entire development site, known as "Riverdale" is approximately 72ha and has a frontage of 800m to Leakes Road and 900m to Davis Road (approximate).

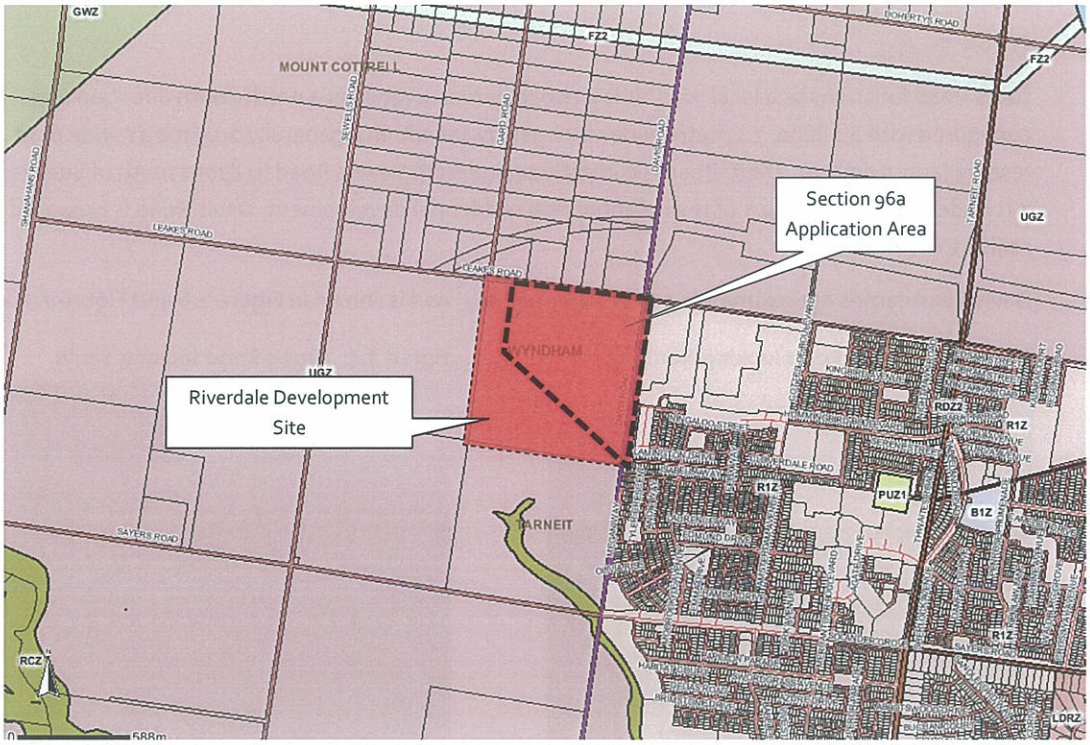
The Riverdale site is located within an Urban Growth Zone (UGZ) and is currently used for agricultural uses. The surrounding properties include a mix of residential and agricultural land uses. In addition, a residential subdivision is currently under construction to the east of the site.

The location of the subject site and the surrounding environs is shown in Figure 2.2, and the land zoning is shown in Figure 2.3.

Figure 2.2: Subject Site and its Environs

(Reproduced with Permission from Google Maps)

Figure 2.3: Land Zoning Map



(Reproduced from Land Channel web site)

2.2 Road Network

2.2.1 Key Roads

Leakes Road

Currently, Leakes Road functions as a local road and is sealed to the west of the site. It is a two-way road aligned in an east - west direction and is configured with a two-lane, 7.0m wide carriageway (varies) set within a 19.0m wide road reserve (approximate).

Leakes Road currently carries approximately 180 vehicles per day[1] and is shown in Figure 2.4 and Figure 2.5.

Figure 2.4: Leakes Road Looking East

Figure 2.5: Leakes Road Looking West

Davis Road

Davis Road functions as a local road. It is a two-way road aligned in a north-south direction and configured with a 2-lane, 7.1 metre wide carriageway set within a generally 20.9 metre wide road reserve (approximate). Davis Road is currently sealed from Sayers Road to 870m south of Leakes Road. It is understood that as part of the neighbouring residential development, Davis Road is proposed to be sealed to Leakes Road.

Davis Road carries approximately 500 vehicles per day[1] and is shown in Figure 2.6 and Figure 2.7 below.

Figure 2.6: Davis Road looking North

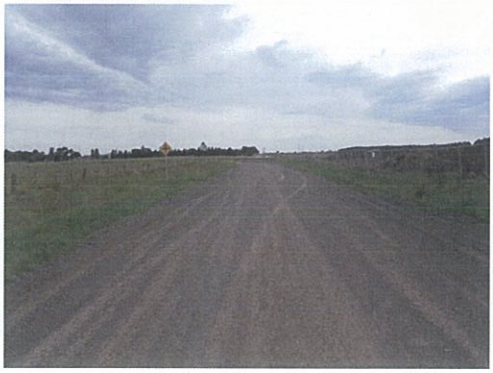


Figure 2.7: Davis Road looking South

[1] Based on pneumatic tube counts commissioned by GTA for the period from Wednesday 10 October 2012 to Wednesday 17 October 2012

Other Roads

Other roads within the vicinity of the site include Sayers Road, located to the south of the subject site and Dohertys Road, located to the north of the site.

2.2.2 Surrounding Intersections

The following intersections currently exist in the vicinity of the site:

- Leakes Road/Davis Road (unsignalised X-intersection)
- Davis Road/Sayers Road (unsignalised X-intersection).

2.2.3 Traffic Volumes

GTA Consultants commissioned weeklong pneumatic tube counts on Leakes Road, (west of Davis Road) and Davis Road (north of Sayers Road) from Wednesday 10 October 2012 to Wednesday 17 October 2012. The results of these surveys indicate that Leakes Road and Davis Road carry an average weekday volume of 180 vehicles per day (vpd) and 500vpd respectively.

2.2.4 Accident Statistics

A review of the reported casualty accident history for the roads and intersections adjoining the subject site has been sourced from VicRoads accident database. The 'CrashStats' database includes all reported casualty accidents since 1987.

A review of the accidents for the last available five year period (1 January 2007 to 31 December 2011) indicates that no incidents have been reported in the vicinity of the site during the nominated period.

2.3 Sustainable Transport Infrastructure

2.3.1 Public Transport

Figure 2.8 shows the subject site in relation to existing public transport routes within its vicinity.

Figure 2.8: Existing Public Transport Map

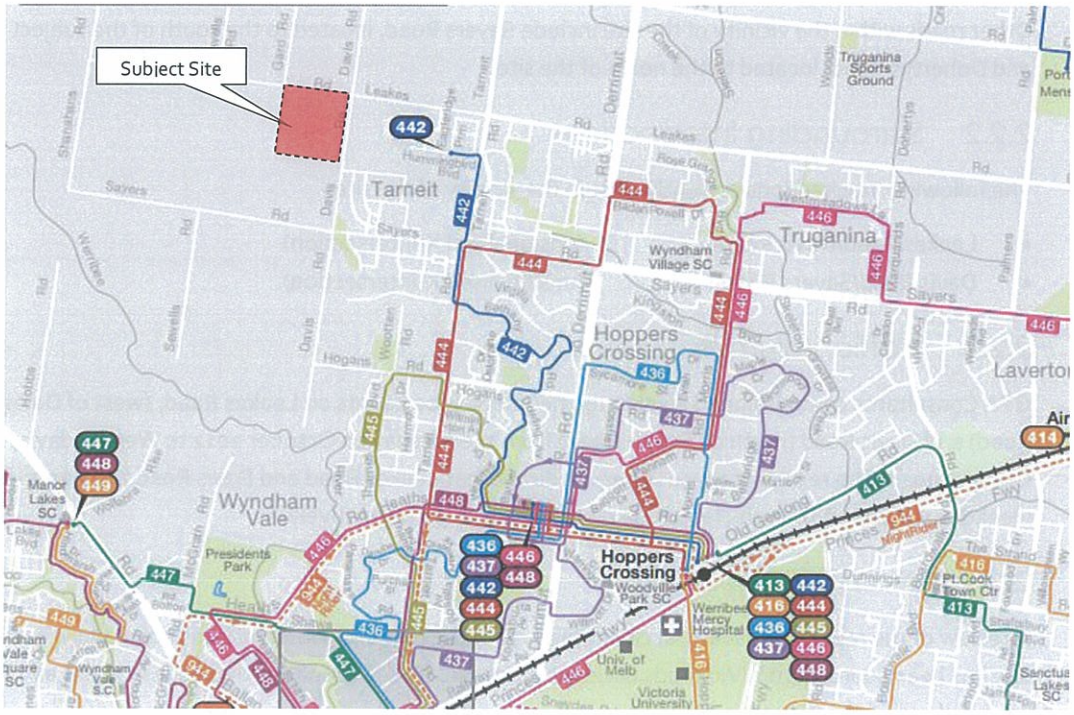


Figure 2.8 indicates that public transport in the immediate vicinity of the site is limited, noting that the 442 bus route currently operates along Tarneit Road, some 1,200m to the east of the site. This service provides a connection to Hoppers Crossing.

2.3.2 Pedestrian and Cyclist Infrastructure

There are currently no pedestrian footpaths or bicycle lanes on either Leakes Road or Davis Road in the immediate vicinity of the site. However, pedestrian paths are provided on the east side of the Davis Road carriageway to the south of the site.

3. Riversdale PSP Area (draft)

3.1 Overview

The site is located within the future Riverdale PSP Area. The Future Urban Structure (draft) for the PSP area is shown in Figure 3.1.

Figure 3.1: Riverdale PSP Area – Future Urban Structure Framework (draft)

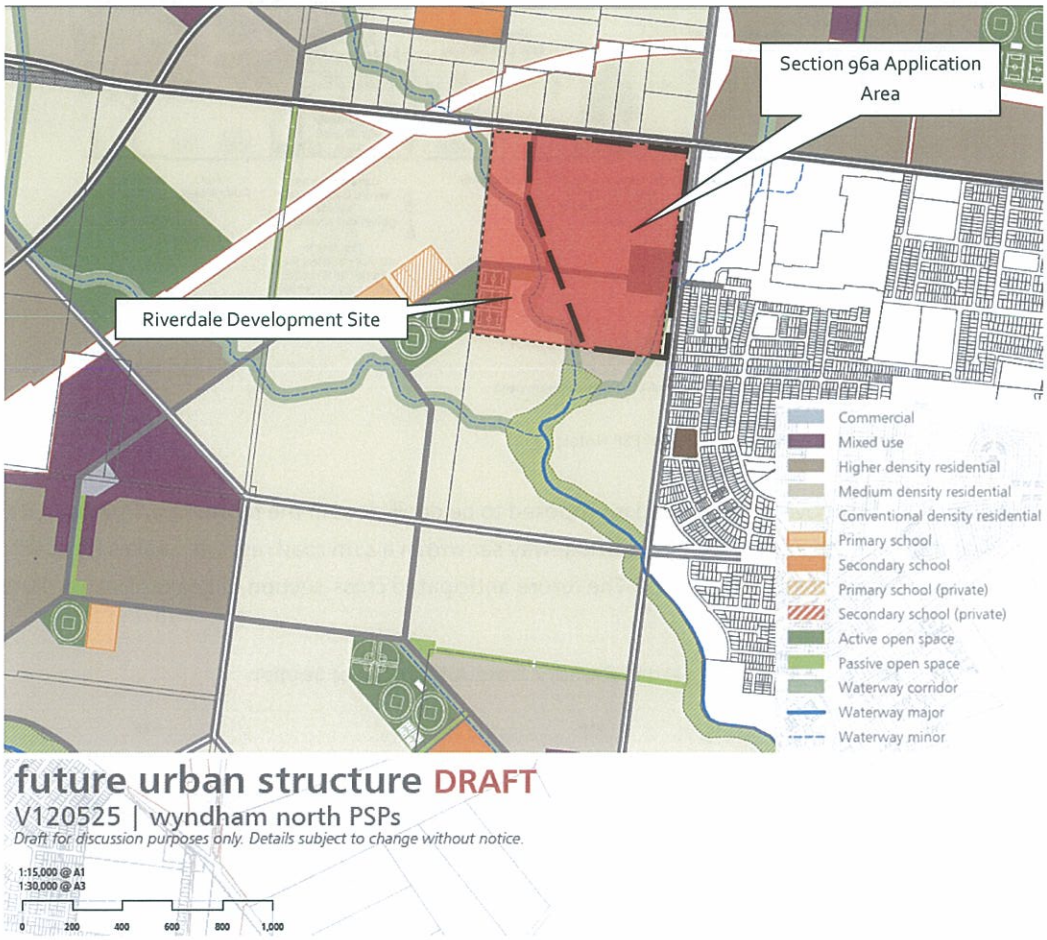


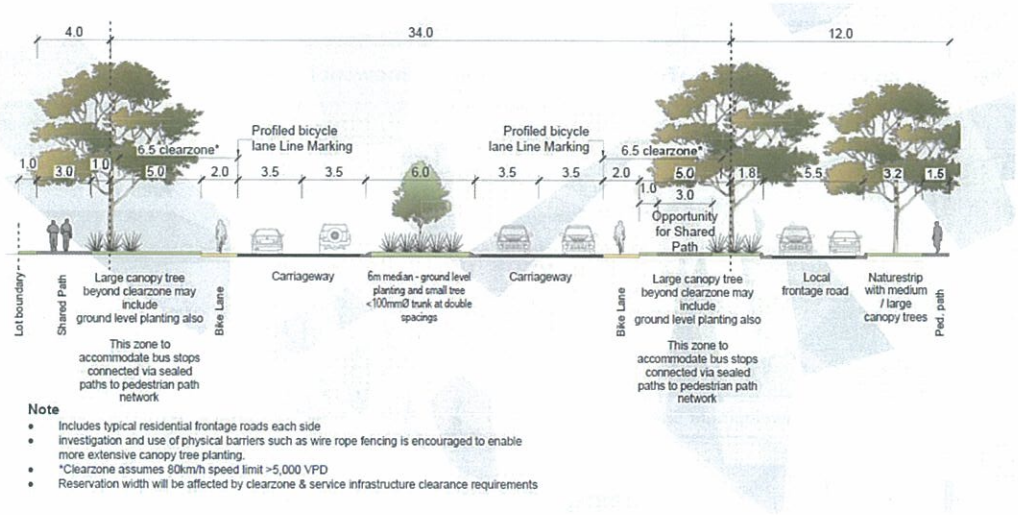
Figure 3.1 indicates that the site is earmarked for residential land uses and will also incorporate a Local Town Centre (LTC). It is noted that Davis Creek is within the western portion of the Riverdale development site and is surrounded by areas of passive open space and a waterway corridor. The Riverdale development site also includes open active space in its south-west corner.

3.2 Road Network

The Future Urban Structure (draft) indicates two connector streets running through the subject site. The north-south connector and east-west connector streets meet at a T-intersection and connect to Leakes Road and Davis Road respectively.

Davis Road to the east of the site is proposed to be duplicated in the future (when demand warrants) to a 'Secondary Arterial' road configured with 4-lane divided carriageway set within 34m road reserve. It is understood that Davis Road will be controlled by Council in the interim prior to it being classified an Arterial Road. The future anticipated cross-section of Davis Road is illustrated in Figure 3.2.

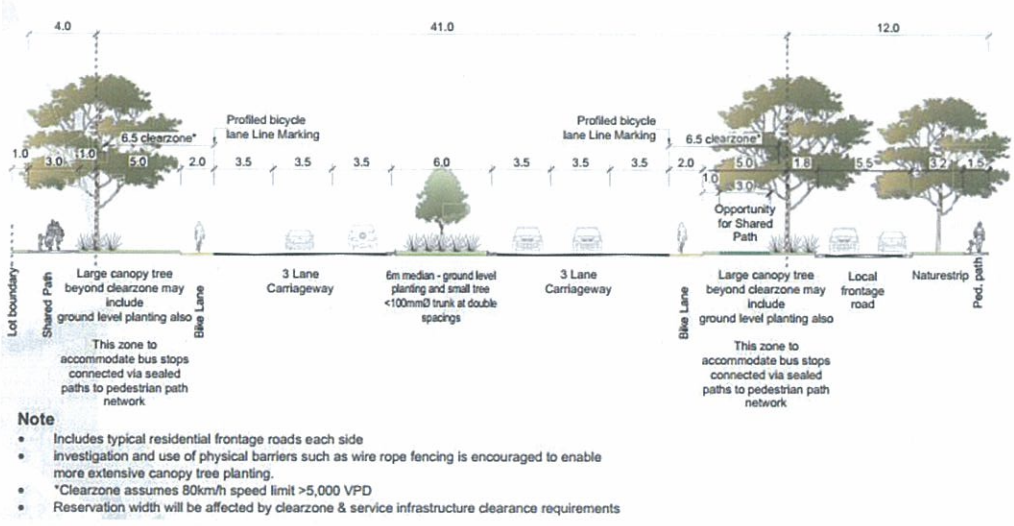
Figure 3.2: Future Davis Road 4-Lane Secondary Arterial Cross Section



(source: GAA 'Our Roads: Connecting People' PSP Notes)

In addition to the above, Leakes Road is proposed to be duplicated in the future to a 'Primary Arterial' road configured with a 6 lane divided carriageway set within a 41m road reserve. Leakes Road will ultimately be controlled by VicRoads. The future anticipated cross-section of Leakes Road is illustrated in Figure 3.3.

Figure 3.3: Future Leakes Road 6-Lane Primary State Arterial Cross Section



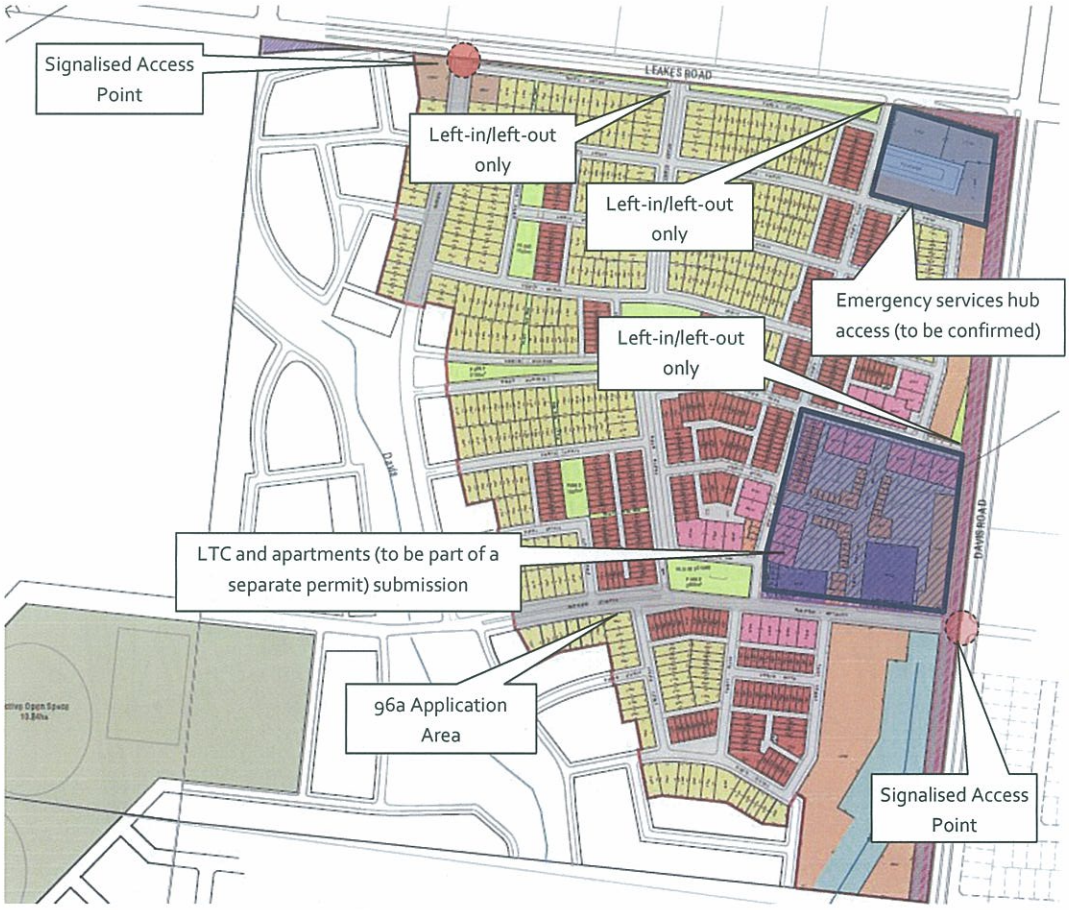
(Source: GAA 'Our Roads: Connecting People' PSP Notes)

4. Development Proposal

4.1 Overall Riverdale Development Site

The overall development proposal for the entire Riverdale site incorporates 572 residential houses, 703 apartments and a Local Town Centre (LTC). The LTC uses (which along with the apartments are not part of this Section 96a application) will consist of some 14,400sqm of commercial uses, 17,600sqm of mixed-use space and 1,200sqm of retail uses. Figure 4.1 illustrates the proposed layout of the Riverdale development site.

Figure 4.1: Proposed Riverdale Site Development Plan



In addition, it is noted that the Applicant is currently in negotiations with the State Emergency Services (SES), Country Fire Brigade (CFB) and Ambulance Victoria to provide an emergency services hub in the north-east corner of the site. Access to this area will be provided via a connection to the immediate east of the emergency services building and also via the left-in/left-out access point 120m west of Davis Road.

4.1.1 Vehicle Access and Internal Circulation

As indicated in Figure 4.1 vehicle access to the Riverdale development site will be provided via five access points to Leakes Road and Davis Road, as follows:

- Leakes Road (590m west of Davis Road): full turning movements
- Leakes Road (360m west of Davis Road): left-in/left-out only
- Leakes Road (120m west of Davis Road): left-in/left-out only
- Davis Road (360m south of Leakes Road): left-in/left-out only
- Davis Road (560m south of Leakes Road): full turning movements.

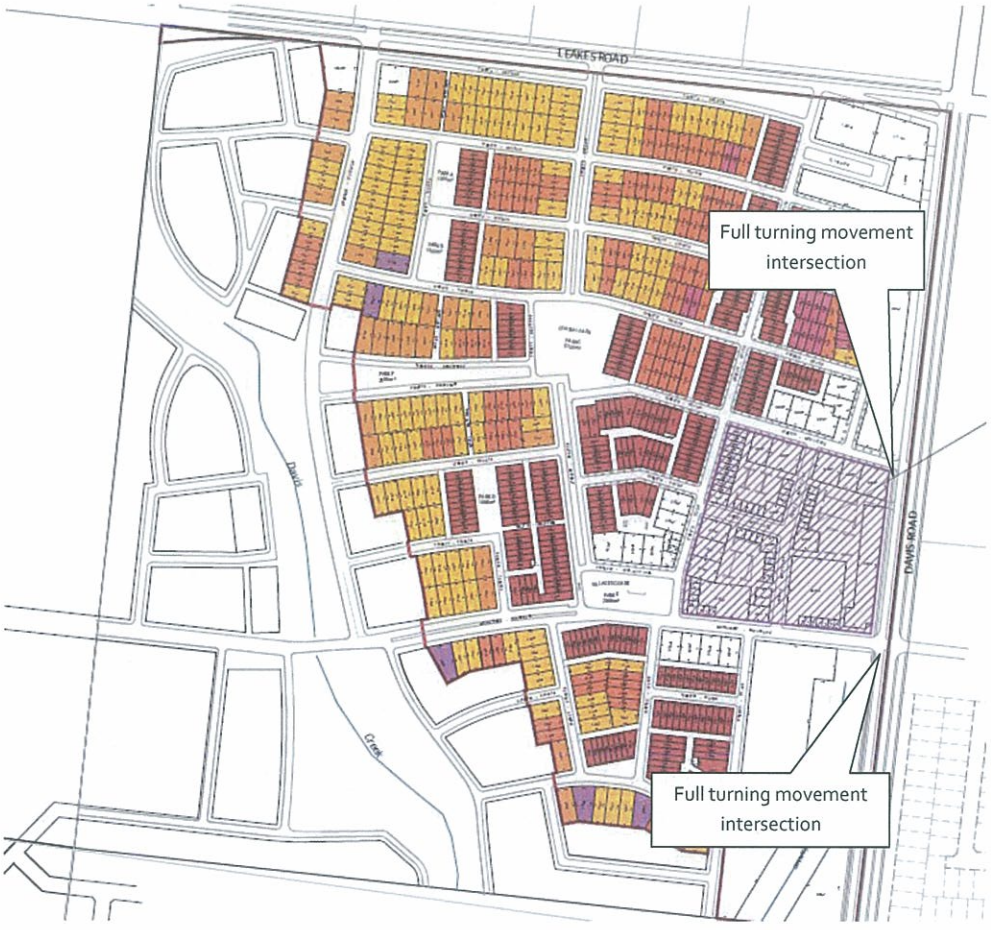
In addition to the above external intersections, vehicle access is proposed to the west via the extension of Main Street (i.e. the east-west Connector Street thought the site), linking the subject site to the nearby schools, open space and future public and active transport facilities.

4.2 Section 96a Application Area

4.2.1 Land Uses

The Section 96a application incorporates a residential subdivision of 572 lots, incorporating traditional and medium density lots. The proposed subdivision layout is illustrated in Figure 4.2. It is understood that development will initially occur from the Davis Road frontage and filter through to the west of the area.

Figure 4.2: Proposed Section 29a Application Area Access Points



4.2.2 Vehicle Access

Vehicle access to the 96a application development area is proposed via two full turning movement intersections (unsignalised) on Davis Road and requires Davis Road to be sealed along the site frontage.

5. Integrated Transport Infrastructure

5.1 Preamble

The Riverdale PSP will outline infrastructure requirements necessary to facilitate development of the area. These requirements include the provision of walking and cycling infrastructure, public transport infrastructure, and the road network. These requirements will provide future development with coherent guidelines which must be met to facilitate development within the precinct.

In this regard, reference is made to the PSP Note "Our Roads: Connecting People" prepared by the GAA. This document indicates that the objective of the road network is:

"to provide guidance for developing road cross sections for PSPs that consider competing transport and community ideal and to provide balanced outcomes and promote more sustainable travel modes".

On the basis of the above, the following sections have been prepared to summarise the walking and cycling, public transport and road network provisions associated with the proposed development and demonstrate their compliance with the typical GAA guidelines.

5.2 Walking

PSP Requirements

The GAA PSP Note indicates that the following outcomes for pedestrians should be achieved through the road network design:

- *"Continuous footpaths on both sides of all streets and roads;*
- *Regular crossing points, shade and rest points;*
- *Provision for users of all abilities;*
- *Pedestrian priority in areas of high foot traffic, (eg town centres - also known as activity centres and schools); and*
- *An attractive appearance to improve amenity and encourage walking."*

It is noted that there are no further specific pedestrian requirements within the draft Future Urban Structure.

Compliance with PSP Requirements

Pedestrian footpaths will be provided on both sides of roads within the proposed subdivision. Each of the roads within the subdivision will be designed in accordance with the requirements of an 'Access Street level 1' which will have pedestrian and cyclist priority.

The key pedestrian connections within the proposed development area are illustrated in Figure 5.1.

Figure 5.1: Key Pedestrian and Cycling Routes

5.3 Cycling

PSP Requirements

The GAA PSP Note indicates that the following outcomes for cyclists should be achieved through the road network design:

- *"Bicycle priority treatments over motorised traffic where appropriate;*
- *On-road bicycle lanes on all connector streets and arterial roads to facilitate travel by cyclists;*
- *Appropriate separation from motor vehicles on high demand cycle routes;*
- *On declared arterial roads, VicRoads may have additional requirements;*
- *Where provided, shared landscape trails on local and connector streets will complement the off road network of shared paths;*
- *Off road shared paths may also be needed on arterial roads; and*
- *Safe road crossing facilities."*

It is noted that there are no further specific cyclist requirements within the draft Future Urban Structure.

Compliance with PSP Requirements

Each of the roads within the subdivision will be designed in accordance with the requirements of an 'Access Street level 1' which will have pedestrian and cyclist priority. Furthermore, it is anticipated that 2m wide bike lanes will be provided within the duplicated cross-sections of Davis Road and Leakes Road, as per GAA guidelines.

The key bicycle routes proposed throughout the development area were previously illustrated in Figure 5.1.

5.4 Public Transport

PSP Requirements

The PSP Note indicates that the following outcomes for public transport should be achieved through the road network design:

- *"Bus routes planned for relevant connectors and arterial roads;*
- *Roads to cater for bus routes shall be designed to accord with the Department of Transport's Public Transport Guidelines for Land Use and Development;*
- *Bus priority treatments where appropriate;*
- *Roadside infrastructure to provide safe and accessible DDA compliant bus stops; and*
- *Safe crossing points to bus stops where appropriate."*

It is noted that there are no further specific public transport requirements within the draft Future Urban Structure. However, it is anticipated that bus services will operate along the Connector Street network within the PSP area.

Compliance with PSP Requirements

The West Growth Corridor plan prepared by GAA indicates that Davis Road is earmarked to form part of the Principal Public Transport Network (PPTN). Therefore it is envisaged that in the future there will be a high frequency of bus services past the site's eastern frontage. Furthermore as Leakes Road, east of Davis Road, forms part of the PPTN, it is anticipated that a bus service along the Leakes Road frontage could be provided as a link to the PPTN.

In addition bus services could potentially operate along the Connector Streets that run through the site. The public transport catchment which can be achieved by the proposed public transport services is shown in Figure 5.2.

Figure 5.2: Public Transport Catchment

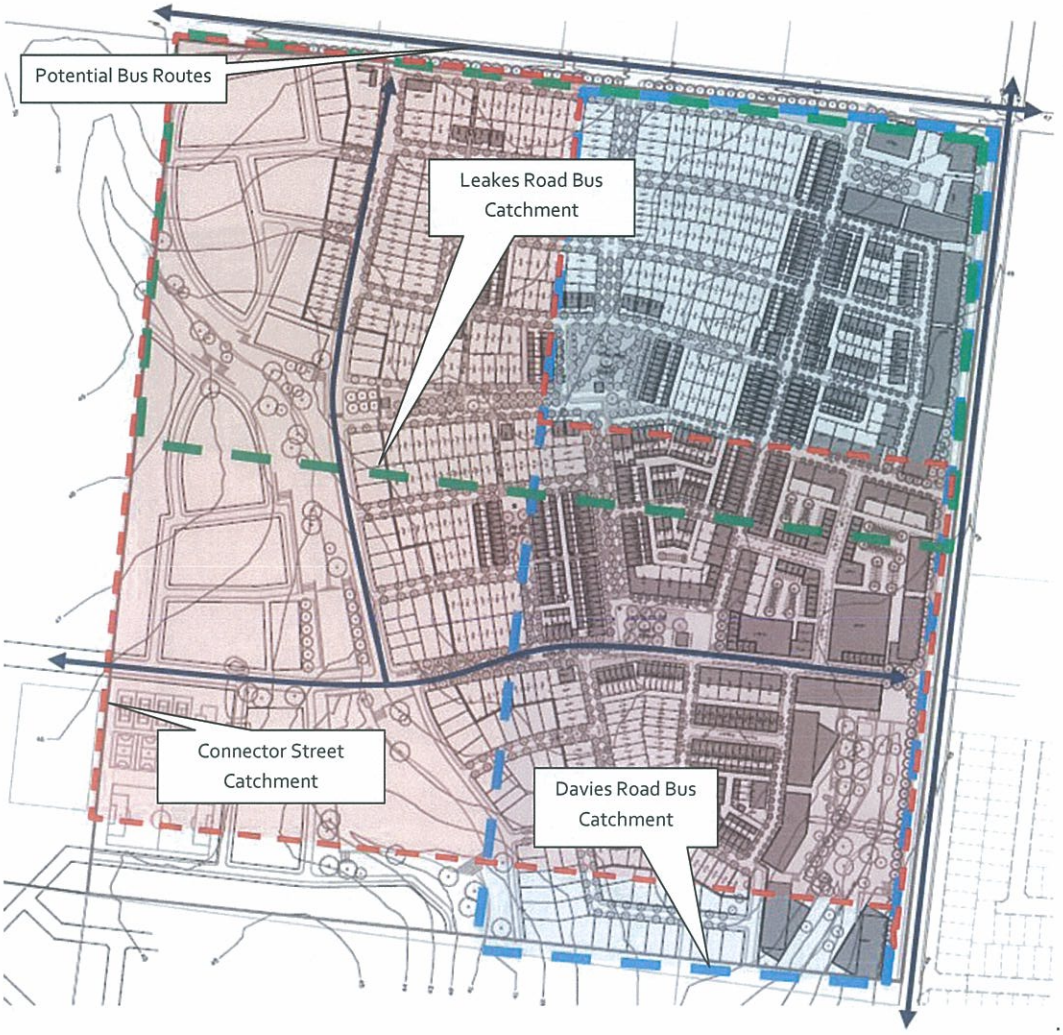


Figure 5.2 above indicates that the majority of the dwellings within the subject site will be located within 400m of potential future public transport services.

5.5 Road Network

PSP Requirements

The GAA PSP Note indicates that the following outcomes for private motor vehicle users should be achieved through the road network design:

- *"High mobility for through traffic with adequate capacity and speeds on arterial roads; and*
- *High accessibility for local traffic with a fine grained local road network, frequent intersections and good property access"*

In addition to the above road network features, the GAA PSP Note recommends that local access streets *"length should be limited to approximately 240m"*. The PSP Note also provides guidance on recommended cross-sections for various road types.

Compliance with PSP Requirements

The proposed road hierarchy for the subject site is shown in Figure 5.3, and Table 5.1 provides a summary of the proposed internal road hierarchy with schematics of the proposed road cross-sections included at Appendix A.

Figure 5.3: Proposed Road Hierarchy

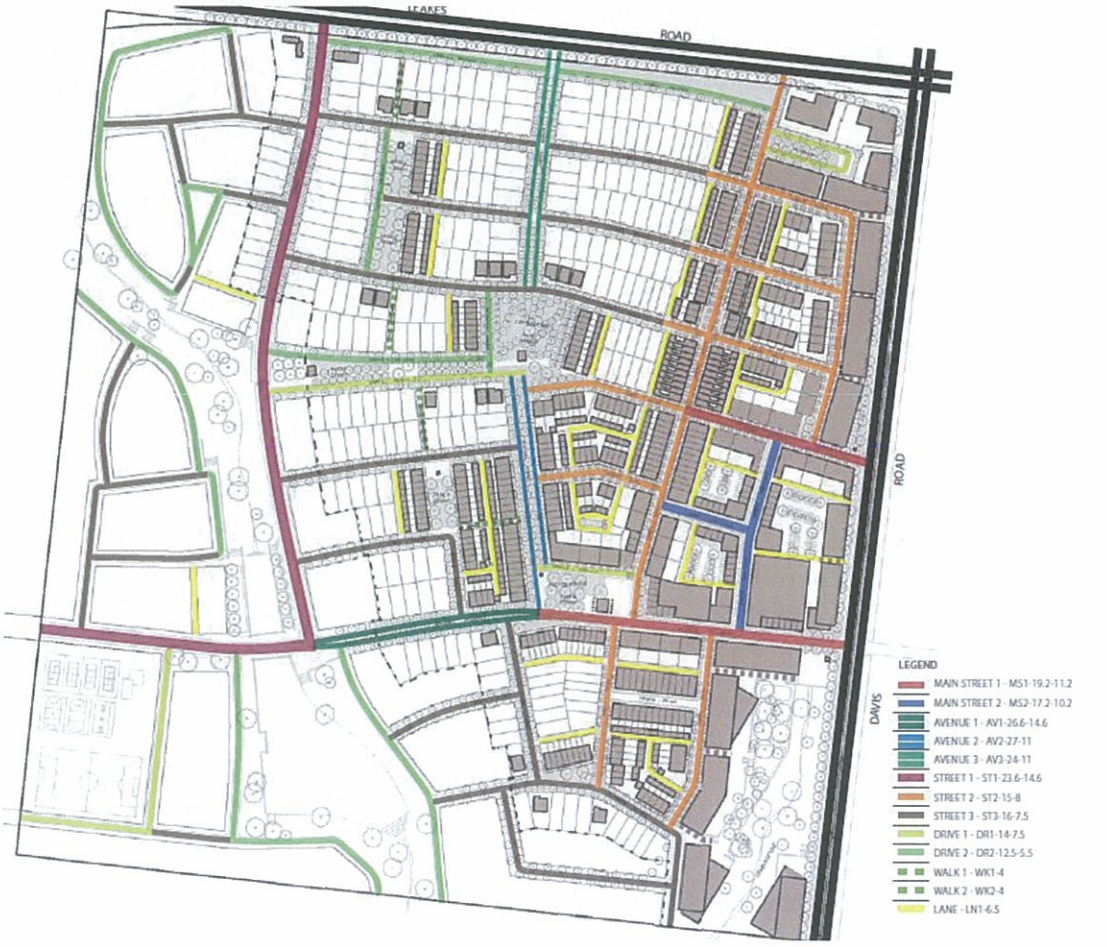


Table 5.1: Proposed Internal Road Hierarchy

Road Hierarchy Classification	GAA Classification	Proposed Road Reservation	Carriageway Width	Parking Provision	Pedestrian and Cyclist Provisions	Anticipated Daily Volume	Compliance with GAA Demonstration Cross-Section
Drive 1 (DR1 – 14-7.5)	Access Street – Level 1	14m	7.5m	Kerbside parking on both sides	Pedestrian paths on both sides of carriageway	Up to 2,000vpd	Narrowed nature strip proposed on the one side of the road adjacent to a shared off-road trail
Drive 2 (DR2 – 15.5-5.5)	Access Lane[1]	12.5m	5.5m	Kerbside parking on one side	Pedestrian paths on both sides of carriageway	Up to 300vpd	n/a
Avenue 1 (AV1 – 26.6-14.6)	Connector Street (Residential)	26.6m	14.6m	Kerbside parking on both sides	Pedestrian paths on both sides of carriageway	3000-7000vpd	Cross-section is generally consistent with the GAA cross-section and includes a central median. Narrowed parking lanes (2.1m) and narrowed nature strips are also proposed.
Avenue 2 (AV2 – 27-11)	Access Street – Level 2	27m	11m	Kerbside parking on both sides	Pedestrian paths on both sides of carriageway	Up to 3,000vpd	Cross-section is generally consistent with the GAA cross-section. The cross-section includes the provision of a wide central median, slightly narrowed parking lanes (2.1m) and narrowed nature strips.
Avenue 3 (AV3 – 24-11)	Access Street – Level 2	24m	11m	Kerbside parking on both sides	Pedestrian paths on both sides of carriageway	Up to 3,000vpd	
Street 1 (ST1 – 23.6-14.6)	Connector Street (Residential)	23.6m	14.6m	Kerbside parking on both sides	Pedestrian paths on both sides of carriageway, dedicated bicycle lane	3000-7000vpd	Cross section is generally consistent with the GAA cross-section with the provision of narrowed parking lanes (2.1m) and narrowed nature strips.
Street 2 (ST2 – 15-8)	Access Street – Level 1	15m	8m	Kerbside parking on both sides	Pedestrian paths on both sides of carriageway	Up to 2,000vpd	The proposed carriageway is generally consistent with the GAA cross-section. Planting within the carriageway is proposed to delineate parking bays instead of nature strips. 3.5m wide footpaths are also proposed.
Street 3 (ST3 16-7.5)	Access Street – Level 1	16m	7.5m	Kerbside parking on both sides	Pedestrian paths on both sides of carriageway	Up to 2,000vpd	The prosed carriageway is generally consistent with the GAA cross-section, with the provision of slightly narrowed nature strips.
Main Street 1 (MS1 -19.2-11.2	Connector Street (for LTC)	19.2	11.2	Kerbside parking on both sides	Pedestrian paths on both sides of carriageway	3000-7000vpd	Narrowed (2.1m) parking lanes are proposed. Furthermore a wide carriageway to facilitate cyclists as per the GAA cross section is not proposed as the Main Street is seen as a destination for cyclists rather than a through route.
Main Street 2 (MS2 – 17.2-10.2)	Connector Street (for LTC)	17.2	10.2	Kerbside parking on both sides	Pedestrian paths on both sides of carriageway	3000-7000vpd	Narrowed (2.1m) parking lanes are proposed. Furthermore 3.0m traffic lanes are proposed as a means to slowing traffic speeds, cycle lanes are not proposed as the Main Street is seen as a destination for cyclists rather than a through route.

[1] The cross-section in consistent with Planning Scheme Requirements, no GAA demonstration cross-section for an access lane is available.

Table 5.1 shows that the proposed cross-sections are generally consistent with the standard GAA demonstration cross-sections, and meet the intentions of the GAA demonstration cross-sections.

A review of the anticipated ultimate daily traffic volumes on the internal road network is provided in Section 6 of this assessment. The assessment indicates that the anticipated daily traffic volumes within the subdivision are within the theoretical capacities presented in Table 5.1.

It is highlighted that the construction of Connector Streets will be funded by the PSP Development Contributions Plan (DCP). The DCP will also provide for the PSP 'interim' (i.e. + 10 year post PSP development) Connector Street/Arterial Road intersection construction and set aside land for the ultimate development of arterial roads and the associated Arterial Road/Connector Street intersections

5.6 External Intersections

As discussed in Section 4, ultimately five intersections are proposed to the external road network. The proposed intersections with Leakes Road are located 590m, 360m and 120m west of the proposed Leakes Road / Davis Road signalised intersection, and the intersections with Davis Road are located 360m and 560m south of the proposed Leakes Road/ Davis Road signalised intersection to the north.

Referencing the VicRoads Access Management Policy (May 2006) and assuming AMP2 and AMP3 type roads for Leakes Road and Davis Road respectively, the above signalised intersection spacings are considered satisfactory.

6. Traffic Impact Assessment

6.1 Preamble

The subject site will initially adopt "interim" access arrangements which will be required to accommodate the traffic volume requirements of the subject site (Section 96a Application). These access arrangements will then be upgraded to accord with the overall 'ultimate' road network requirements outlined within the PSP, as future development of surrounding sites is completed.

The following sections have been prepared to assess the operation of the interim access arrangement, noting that the ultimate access arrangements are consistent with those included in the draft PSP, and as such have already been assessed in some detail, and are therefore considered to be satisfactory.

6.2 Traffic Generation

The Victorian Integrated Survey of Travel Activity (VISTA) is a survey of personal travel for residents in each of the Melbourne municipalities and major regional centres in Victoria. Travel data collated provided data regarding the number of trips each household generated, including vehicle (passenger and driver), public transport, walking and cycling trips. Reference to the VISTA07 dataset indicates an average range of 2.5 to 7.2 car trips per household within Metropolitan Melbourne. Specifically the most recent data for Wyndham (2009) indicates a car generation rate of 6.0 movements per household. It is noted that this data does not distinguish between various housing types, i.e. detached, medium density or apartment types or indeed location (municipality wide).

In order to present a conservative assessment and having consideration for the initial 'isolation' of the Section 96a application area an initial traffic generation rate of 8 movements per day per lot has been assumed. In this regard it is anticipated that the traffic generation rate will reduce as the surrounding non-residential land uses are developed, at which point walking, cycling and public transport trips will become more attractive, accordingly a traffic generation rate of 6.0 movements per household has been adopted following development of the entire Riverdale development site.

6.2.1 Overall Riverdale Development Site

Based on the above, Table 6.2 sets out traffic generation estimates for both peak hour and daily periods for the overall Riverdale development site.

Table 6.1: Estimated Overall Riverdale Site Development Traffic Generation

Use	Size	Design Generation Rates		Traffic Generation Estimates	
		Peak Hour [1]	Daily	Peak Hour	Daily
Dwellings (traditional)	833 dwellings	0.6 vehicle movements / dwelling	6 vehicle movements / dwelling	500vph	4,998vpd
Dwellings (apartments)	825 apartments	0.6 vehicle movements / dwelling	6 vehicle movements / dwelling	495vph	4,950vpd
Office	5,020sqm	2 vehicle movements / 100sqm	10 vehicle movements / 100sqm	100vph	502vpd
Commercial	9,418sqm	2 vehicle movements / 100sqm	10 vehicle movements / 100sqm	188vph	942vpd
Mixed-Use	17,630sqm	4.8 vehicle movements / 100sqm[1]	44 vehicle movements / 100sqm[1]	846vph	7,757vpd
Retail	1,175sqm	7.6 vehicle movements / 100sqm	78 vehicle movements / 100sqm	89vph	917vpd
			Total	**2,218vph**	**20,066vpd**

[1] Rates for non-residential uses have been sourced from the RTANSW "Guide to Traffic Generating Developments" document.

Table 6.1 indicates that the overall Riverdale site could be expected to generate appropriately 20,100 vehicle movements per day and 2,200 vehicle movements during each respective peak hour on a typical weekday.

6.2.2 96a Application

Base on the above, Table 6.2 sets out traffic generation estimates for both peak hour and daily periods for the Section 96a Application development area.

Table 6.2: Estimated Section 96a Development Area Traffic Generation

No. of Dwellings	Design Generation Rates		Traffic Generation Estimates	
	Peak Hour [1]	Daily	Peak Hour	Daily
572 dwellings	0.8 vehicle movements / dwelling	8 vehicle movements / dwelling	458vph	4,576vpd

[1] Adopting a peak to daily ratio of 10%.

Table 6.2 indicates the proposed 96a development application could be expected to generate approximately 4,600 vehicle movements per day and 460 vehicle movements during any peak hour.

6.3 Distribution and Assignment

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

i configuration of the arterial road network in the immediate vicinity of the site
ii existing operation of intersections providing access between the local and arterial road network
iii distribution of households in the vicinity of the site
iv surrounding employment centres, retail centres and schools in relation to the site
v configuration of access points to the site.

In terms of the existing road network it is noted that Davis Road along the site frontage and Leakes Road to the east of Davis Road are both anticipated to be upgraded to urban standard roads prior to the full occupation of the Riverdale site[2].

Having consideration to the above, for the purposes of estimating vehicle movements, the following directional distributions have been assumed for the Section 96a Application area:

- Davis Road (North) 50%
- Davis Road (South) 50%.

In addition, the directional split of traffic (i.e. the ratio between the inbound and outbound traffic movements) have been assumed to be 80% out to 20% in during the AM peak hour, and 40% out to 60% in during the PM peak hour.

Based on the above, Figure 6.1 and Figure 6.2 have been prepared to show the estimated increase in turning movements in the vicinity of the subject site following development of the 96a Application area.

Figure 6.1: AM Peak Hour Site Generated Traffic Volumes

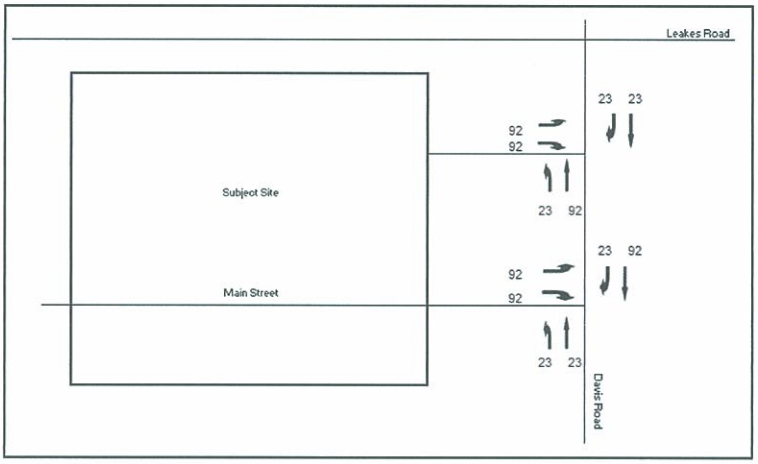
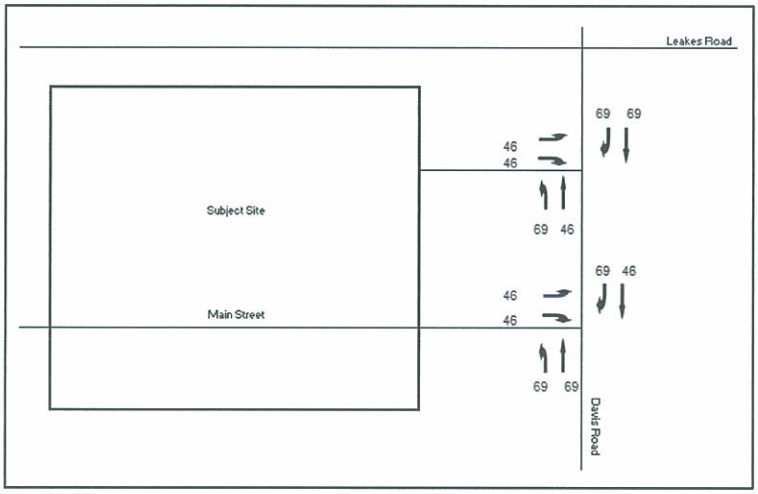


Figure 6.2: PM Peak Hour Site Generated Traffic Volumes



[2] Based on discussions with GAA.

6.4 Traffic Impact – Peak Hour

6.4.1 Traffic Volumes

In order to assess the future traffic performance of the proposed site access points on Davis Road, future traffic volumes have been obtained from the draft outputs of the GAA commissioned Melbourne Integrated Transport Model (MITM) for the Wyndham North PSPs. MITM predicts 2046 daily traffic volumes as well as AM and PM peak two hour volumes. The modelled volumes on Davis Road are:

- AM peak 2 hour: Northbound: 2,000 vehicles, Southbound: 2,700 vehicles
- PM peak 2 hour: Northbound: 2,800 vehicles, Southbound: 2,500 vehicles

Based on previous experience from work undertaken by GTA, a conversion factor (0.55) has been used to convert the two hour peak volumes into a peak hour volume for analysis.

The 2046 model assumes that Davis Road has been duplicated to a four-lane road. Given that we are only assessing the initial operation of the Davis Road intersection, Davis Road will initially be configured as a two-way, two-lane road. Therefore, for the purpose of the assessment, the two hour peak traffic volumes for the AM and PM periods have been have been halved, as follows:

- AM peak hour: Northbound: 550vph, Southbound: 743vph
- PM peak hour: Northbound: 770vph, Southbound: 688vph

Given the existing traffic volumes on Davis Road are low (approximately 360vpd) such an assessment is considered conservative on the high side.

By adding the AM and PM development traffic to the future traffic flows we can estimate the future traffic volumes. These are outlined in Figure 6.3 and Figure 6.4.

Figure 6.3: AM Peak Hour Post Development Traffic Volumes

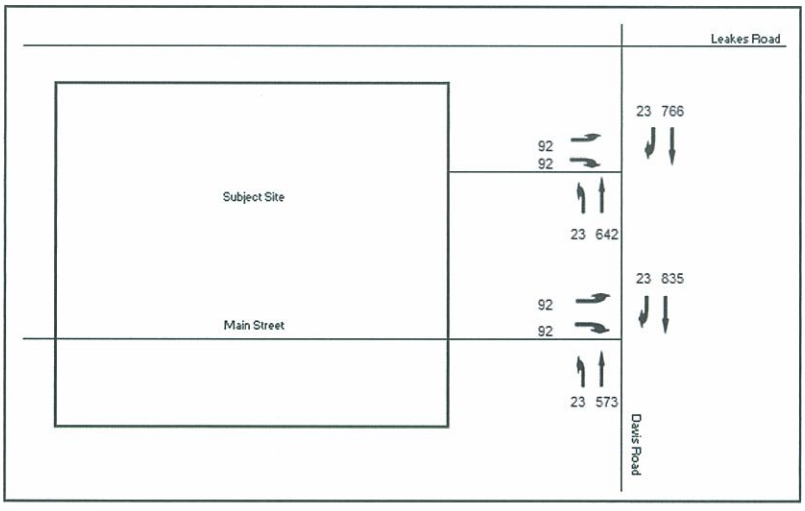
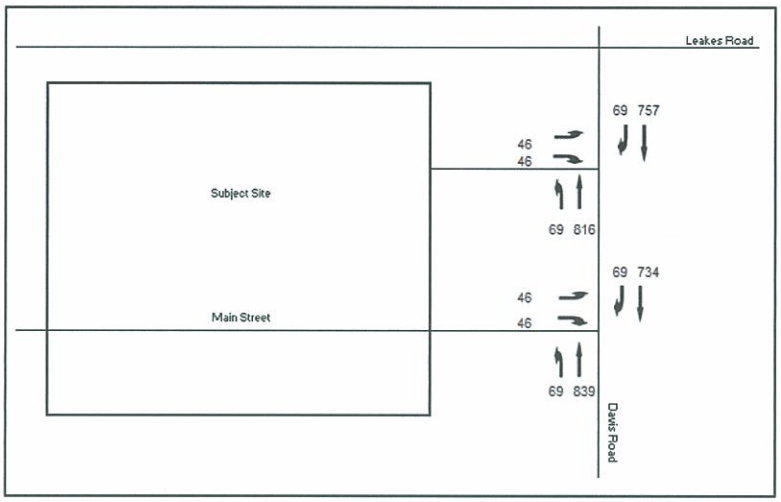


Figure 6.4: PM Peak Hour Post Development Traffic Volumes



6.4.2 Post-Development Intersection Operation

The operation of the Site Access intersections with Davis Road following development of the Section 96a Application area have been assessed using *SIDRA INTERSECTION*, 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 typically considered the practical limit, beyond which queues and delays increase disproportionately[3].

The modelled unsignalised intersection layout for both intersections is shown Figure 6.5 and the results of the modelling are summarised in Table 6.3 and Table 6.4.

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

		Intersection Degree of Saturation (X)		
		Signals	Roundabouts	Unsignalised
A	Excellent	<=0.60	<=0.60	<=0.60
B	Very Good	0.60-0.70	0.60-0.70	0.60-0.70
C	Good	0.70-0.90	0.70-0.85	0.70-0.80
D	Acceptable	0.90-0.95	0.85-0.95	0.80-0.90
E	Poor	0.95-1.00	0.95-1.00	0.90-1.00
F	Very Poor	>=1.0	>=1.0	>=1.0

Figure 6.5: Proposed Post-Development Layout for Access Intersections with Davis Road

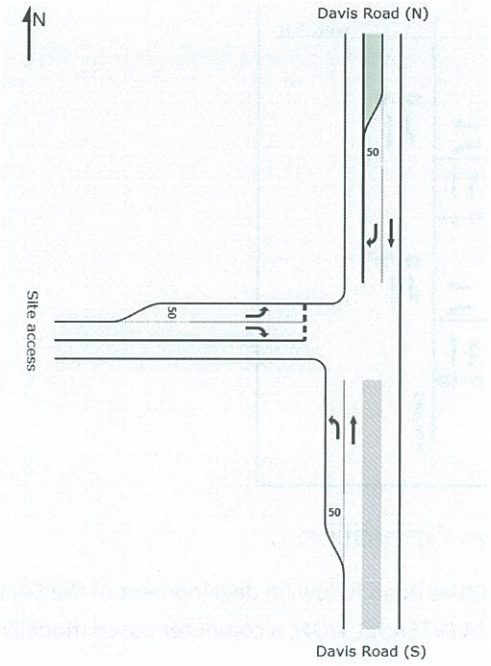


Table 6.3: Northern Site Access Intersection Operation - Immediate Access Scenario

Peak Hour	Approach	DOS	Average Delay	95th Percentile Queue
AM Peak	Davis Road (south)	0.36	Nil	Nil
	Davis Road (north)	0.42	Nil	1 m
	Site Access (west)	# 0.59	27 sec	17 m
PM Peak	Davis Road (south)	# 0.45	1 sec	nil
	Davis Road (north)	0.42	1 sec	3 m
	Site Access (west)	# 0.45	33 sec	11 m

DOS – Degree of saturation, # - Intersection DOS

Table 6.4: Southern Site Access Intersection Operation – Immediate Access Scenario

Peak Hour	Approach	DOS	Average Delay	95th Percentile Queue
AM Peak	Davis Road (south)	0.32	Nil	Nil
	Davis Road (north)	0.46	Nil	1 m
	Site Access (west)	# 0.59	26 sec	17 m
PM Peak	Davis Road (south)	# 0.47	1 sec	Nil
	Davis Road (north)	0.41	1 sec	3 m
	Site Access (west)	0.45	33 sec	11 m

DOS – Degree of saturation, # - Intersection DOS

Table 6.3 and Table 6.4 indicate that the proposed Davis Road/Site Access intersections are anticipated to operate at an 'excellent' level of service following the completion and occupation of 572 lots proposed by the Section 96a Application.

6.4.3 Ultimate Intersection Operation

The ultimate layouts of the Riverdale site assess intersections (Connector Street/Arterial Road intersections) will be assessed as part of the draft Riversdale PSP. Given the proposed development yield and interim (i.e. immediate post development) access arrangements are anticipated to be generally consistent with the draft PSP, the access arrangements are considered satisfactory.

6.5 Traffic Impact - Daily

On the basis of the anticipated overall Riverdale development site-generated traffic volumes presented in Section 6.1, it is anticipated that the Riverdale site will generate in the order of 20,100 vehicle movements per day. The anticipated site generated daily traffic volumes on the internal road network are presented in Figure 6.6. It is noted that the volume estimates presented below assume full development of the PSP (i.e. the provision of surrounding schools, activity centre and recreation facilities).

Figure 6.6: Ultimate Internal Daily Two-way Traffic Volumes

The two-way daily volumes are consistent with the anticipated daily volumes for the proposed road hierarchy for the site as outlined in Section 5 of this report. On this basis, and given that the internal road hierarchy is consistent the road hierarchy outlined within the PSP, the proposed internal road network is anticipated to be sufficient to cater for the daily volumes outlined within Figure 6.6.

7. Conclusion

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

i The proposed overall Riverdale development is anticipated to generate approximately 20,100 vehicle movements per day and 2,200 vehicle movements per hour in the peak hours.

ii The 96a Application area is anticipated to generate 4,600 vehicle movements per day and 460 vehicle movements per hour in the commuter peaks.

iii The immediate post development access strategy is anticipated to be appropriate to cater sufficiently for all the traffic generated by the 96a Application area.

iv The proposed subdivision will include a walking and cycling network in accordance with the aims of the PSP.

v The proposed street network has been designed in accordance with the PSP with road reservations sufficient to accommodate the requirements of the PSP.

Appendix A

Proposed Road Cross Sections

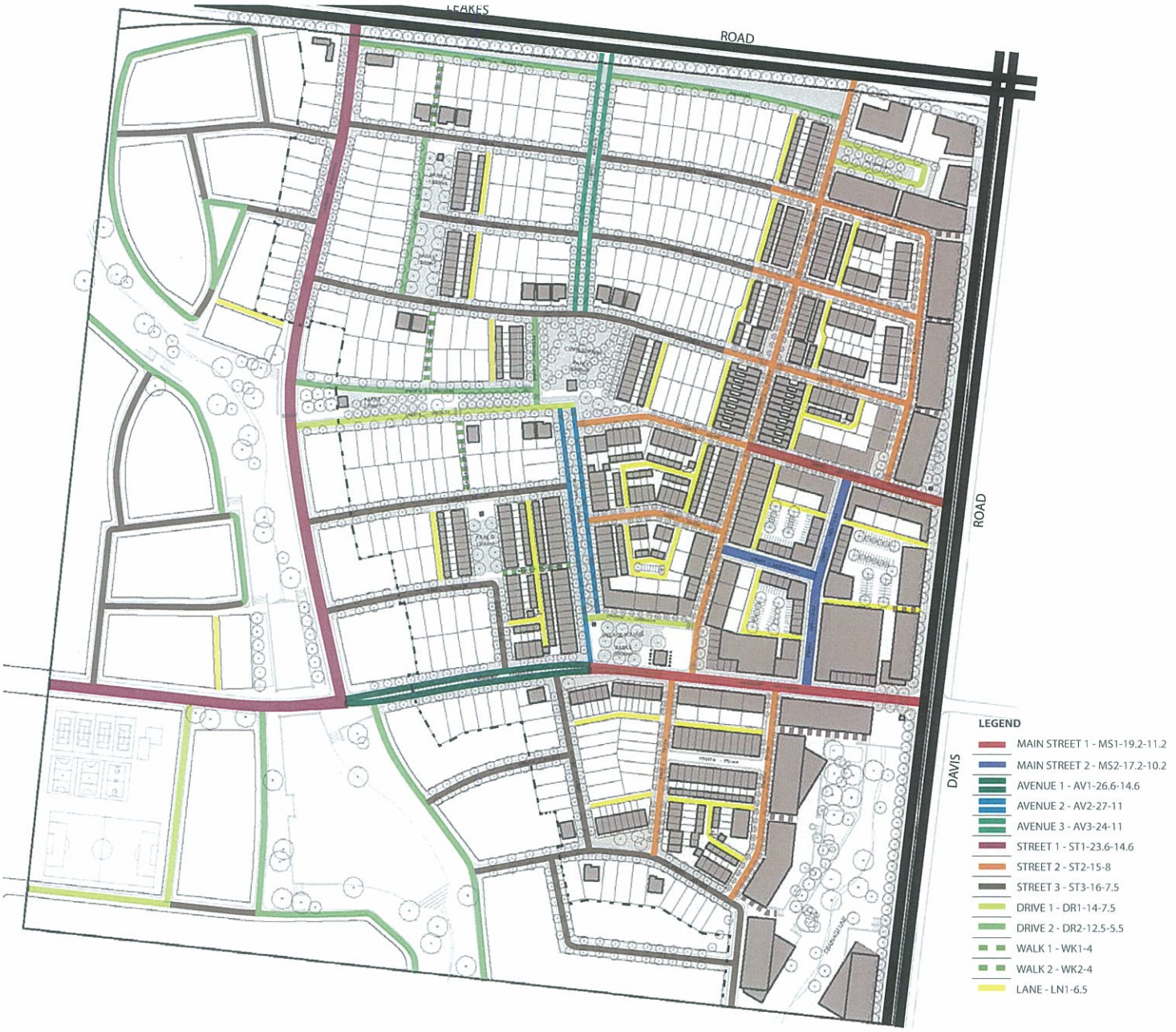
STREET TYPOLOGIES

The Riverdale Master Plan is based on traditional neighbourhood design principles and as such is designed to be a community that accommodates a range of different street typologies based on the best existing streetscapes in Melbourne's most loved neighbourhoods.

Riverdale's streets are designed as an interconnected street network with each typology responding directly to the context in which is placed. Each street is designed for both capacity and character and is designed as a legible environment for the pedestrian, cyclist and driver. The design attempts to balance an equitable access for all residents with aesthetics and functionality.

Riverdale will have a village centre which will be a highly urban context by its nature. At full build-out the village centre will be home to an array of shops, studios, apartment buildings and terrace homes. Fully paved footpaths and narrow streets will deliver an urban aesthetic

The western area will become much less dense and predominantly residential as people move further west through the neighbourhood. Street design will reflect this with different street plantings and treatments and detached homes providing less street enclosure.



STREET TYPOLOGIES

STREET TYPOLOGY DESCRIPTION DOCUMENTATION MODEL

Each Street Type has been documented as per following scheme:

ROAD SECTION DIAGRAM
Typical road section diagram including location and/or dimensions of:

- Footpaths and verge treatments
- Cycling lanes and paths
- Parking lanes and treatments
- Traffic lanes
- Indicative planting Type/Location
- Indicative building/private lot interface

MASTER PLAN KEY
Providing location of subject street type.

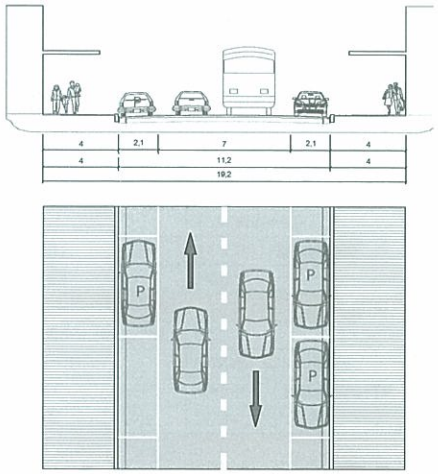
TYPOLOGY & No. | CODE | RESERVE | PAVEMENT

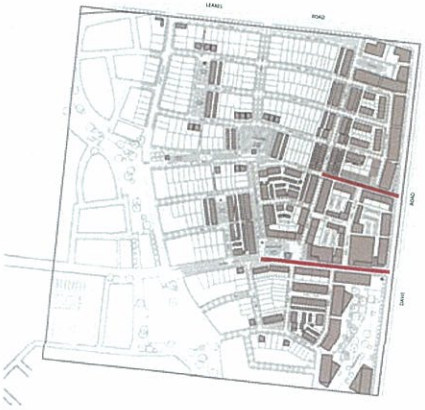
STREET 1 - ST1-16.5-7.5		
THOROUGHFARE SUMMARY		
ROAD RESERVE/PAVEMENT		
TYPICAL SPEED/MOVEMENT		
ROAD FUNCTION	GAA COMPRABLE STANDARD ROAD ELEMENTS	
PEDESTRIAN CROSSING TIME	CALCULATED AT 1.5M/SEC	
TRAFFIC LINE ASSEMBLY		
TRAFFIC LANES		
PARKING LANES		
CYCLING PATH		
MEDIAN		
KERB TYPE/RADIUS		
EFFECTIVE TURNING RADIUS		
PUBLIC STREETSCAPE		
VERGE WIDTH		
FOOTPATH WIDTH		
STREET TREE PLANTING		
Notes:		

CASE STUDY/PRECEDENT PICTURE
Examples of existing street type.

STREET TYPE SUMMARY TABLE
Including techinal design standards

MAIN STREET 1: MS1-19.2-11.2

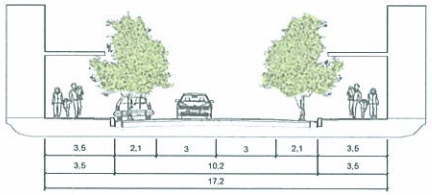


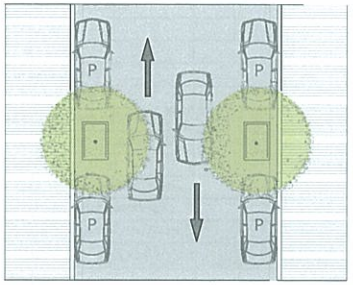


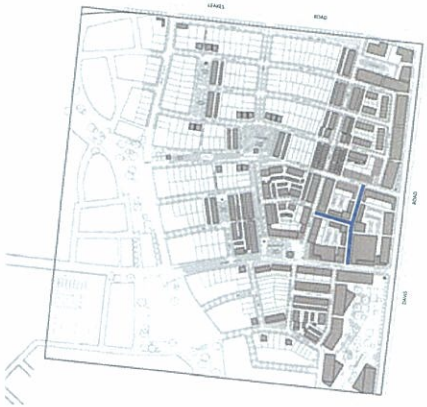
MAIN STREET 1 - MS1-19.2-11.2		
THOROUGHFARE SUMMARY		
ROAD RESERVE/PAVEMENT	19.2m	11.2m
TYPICAL SPEED/MOVEMENT	50km/h	MEDIUM/FREE
ROAD FUNCTION	CONNECTOR STREET IN LOCAL TOWN CENTRE	
PEDESTRIAN CROSSING TIME	7.4s	
TRAFFIC LINE ASSEMBLY		
TRAFFIC LANES	TWO	
PARKING LANES	2 x 2.1m | MARKED	
CYCLING PATH	N/A	
MEDIAN	N/A	
KERB TYPE/RADIUS	RAISED	3.0m
EFFECTIVE TURNING RADIUS	10m	
PUBLIC STREETSCAPE		
VERGE WIDTH	4m	
FOOTPATH WIDTH	4m (Fully Paved)	
STREET TREE PLANTING	N/A (Awning Preferred)	
Notes: Main street environment within an urban, mixed use environment. A busy and slow speed environment. The most important commercial street at Riverdale.		

STREET TYPOLOGIES

MAIN STREET 2: MS2-17.2-10.2

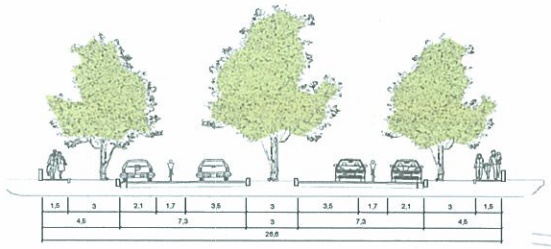


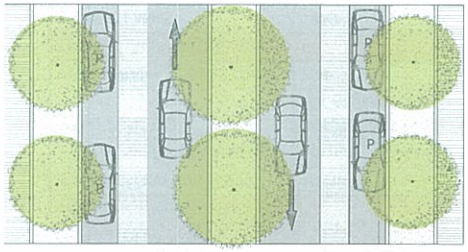




MAIN STREET 2 - MS2-17.2-10.2		
THOROUGHFARE SUMMARY		
ROAD RESERVE/PAVEMENT	17.2m	10.2m
TYPICAL SPEED/MOVEMENT	50km/h	SLOW/FREE
ROAD FUNCTION	ACCESS STREET 2	
PEDESTRIAN CROSSING TIME	6.8m	
TRAFFIC LINE ASSEMBLY		
TRAFFIC LANES	TWO	
PARKING LANES	2 x 2.1m / UNMARKED	
CYCLING PATH	N/A	
MEDIAN	N/A	
KERB TYPE/RADIUS	RAISED	3.0m
EFFECTIVE TURNING RADIUS	10m	
PUBLIC STREETSCAPE		
VERGE WIDTH	3.5m	
FOOTPATH WIDTH	3.5m (Fully Paved)	
STREET TREE PLANTING	FORMAL/WITHIN STREET	
Notes: Highly urban secondary commercial street with liner retail and commercial frontage. Parallel parking and fully paved paths with street dining and busy pedestrian feel.		

AVENUE 1: AV1-26.6-14.6

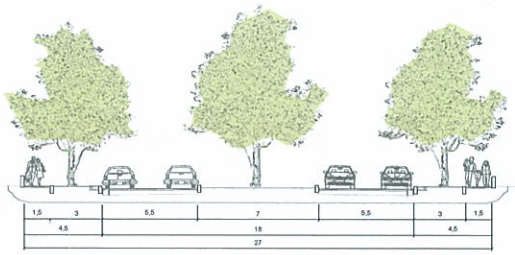


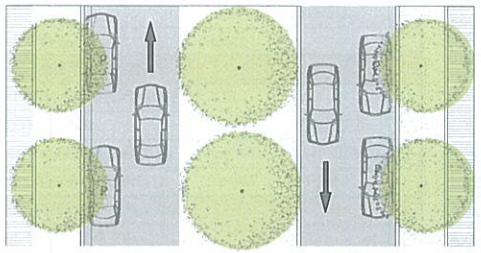


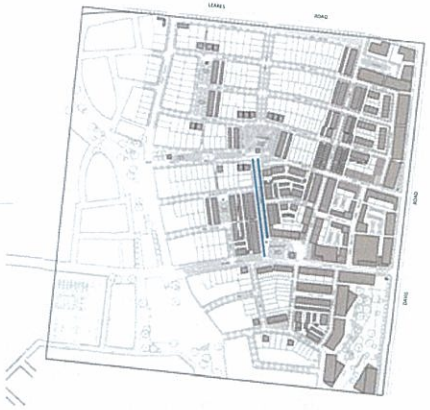
AVENUE 1 - AV1-26.6-14.6		
THOROUGHFARE SUMMARY		
ROAD RESERVE/PAVEMENT	26.6m	14.6m
TYPICAL SPEED/MOVEMENT	60kmh	MEDIUM/FREE
ROAD FUNCTION	CONNECTOR STREET	
PEDESTRIAN CROSSING TIME	9.7s	
TRAFFIC LINE ASSEMBLY		
TRAFFIC LANES	TWO	
PARKING LANES	2 x 2.1m | UNMARKED	
CYCLING PATH	1.7m MARKED	
MEDIAN	3.0m	
KERB TYPE/RADIUS	RAISED	3.0m
EFFECTIVE TURNING RADIUS	10m	
PUBLIC STREETSCAPE		
VERGE WIDTH	4.5m	
FOOTPATH WIDTH	1.5m	
STREET TREE PLANTING	FORMAL/GRASS STRIP	
Notes: Avenue extension of main street. Links two prominent locations; the creek and linear parklands with the Village Square		

STREET TYPOLOGIES

AVENUE 2: AV2-27-11

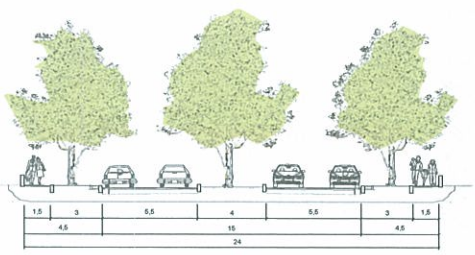


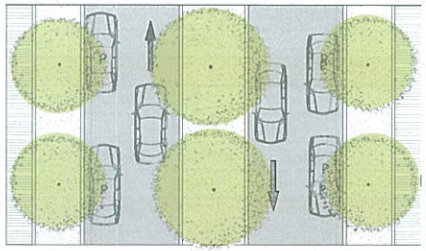




AVENUE 2 - AV2-27-11		
THOROUGHFARE SUMMARY		
ROAD RESERVE/PAVEMENT	27m	11m
TYPICAL SPEED/MOVEMENT	60kmh	MEDIUM/FREE
ROAD FUNCTION	ACCESS STREET 2	
PEDESTRIAN CROSSING TIME	7.3s	
TRAFFIC LINE ASSEMBLY		
TRAFFIC LANES	TWO	
PARKING LANES	2 x 2.1m | UNMARKED	
CYCLING PATH	N/A	
MEDIAN	7.0m	
KERB TYPE/RADIUS	RAISED	3.0m
EFFECTIVE TURNING RADIUS	10m	
PUBLIC STREETSCAPE		
VERGE WIDTH	3.0m	
FOOTPATH WIDTH	1.5m	
STREET TREE PLANTING	FORMAL	
Notes:		

AVENUE 3: AV3-24-11

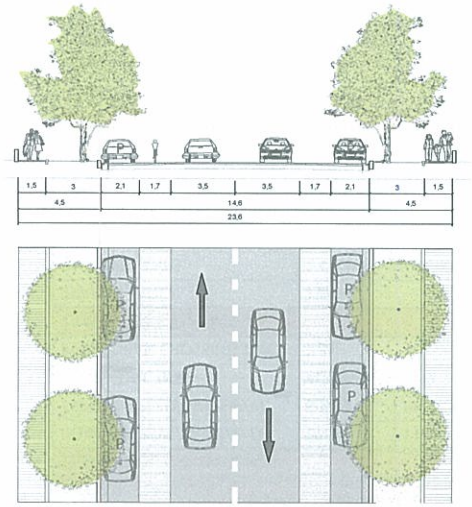




AVENUE 3 - AV3-24-11		
THOROUGHFARE SUMMARY		
ROAD RESERVE/PAVEMENT	24m	11m
TYPICAL SPEED/MOVEMENT	60kmh	MEDIUM/FREE
ROAD FUNCTION	ACCESS STREET 2	
PEDESTRIAN CROSSING TIME	7.3s	
TRAFFIC LINE ASSEMBLY		
TRAFFIC LANES	TWO	
PARKING LANES	2 x 2.1m | UNMARKED	
CYCLING PATH	N/A	
MEDIAN	4m	
KERB TYPE/RADIUS	RAISED	3.0m
EFFECTIVE TURNING RADIUS	10m	
PUBLIC STREETSCAPE		
VERGE WIDTH	3.0m	
FOOTPATH WIDTH	1.5m	
STREET TREE PLANTING	FORMAL/PLANTER BOX URBAN STRIP GRAVEL STRIP	
Notes:		

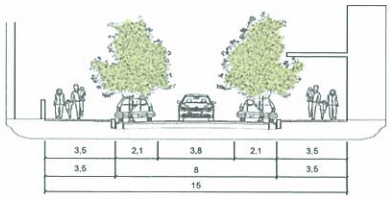
STREET TYPOLOGIES

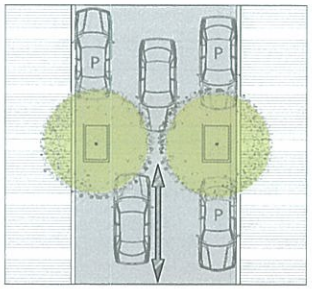
STREET 1: ST1-23.6-14.6

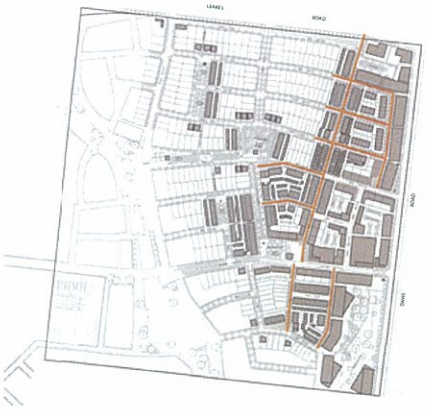


STREET 1 - S1-23.6-14.6		
THOROUGHFARE SUMMARY		
ROAD RESERVE/PAVEMENT	23.6m	14.6m
TYPICAL SPEED/MOVEMENT	70km/h	MEDIUM/FREE
ROAD FUNCTION	CONNECTOR STREET	
PEDESTRIAN CROSSING TIME	9.7s	
TRAFFIC LINE ASSEMBLY		
TRAFFIC LANES	TWO	
PARKING LANES	2 x 2.1m | MARKED	
CYCLING PATH	1.7m	
MEDIAN	N/A	
KERB TYPE/RADIUS	RAISED	3.0m
EFFECTIVE TURNING RADIUS	10m	
PUBLIC STREETSCAPE		
VERGE WIDTH	4.5m	
FOOTPATH WIDTH	1.5m	
STREET TREE PLANTING	FORMAL	
Notes:		

STREET 2: ST2-15-8



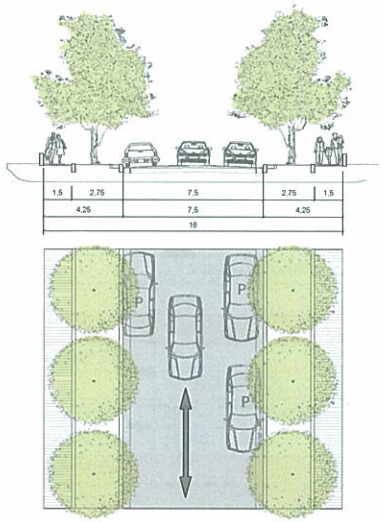


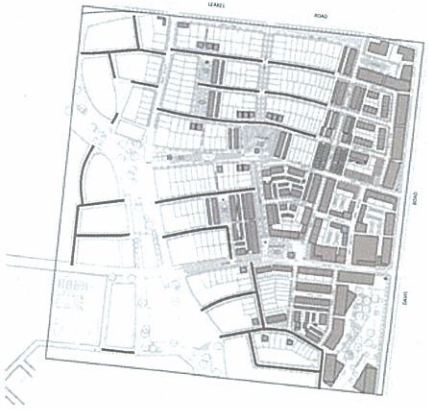


STREET 2 - ST2-15-8		
THOROUGHFARE SUMMARY		
ROAD RESERVE/PAVEMENT	15m	8m
TYPICAL SPEED/MOVEMENT	30km/h	SLOW/YIELD
ROAD FUNCTION	ACCESS STREET 1	
PEDESTRIAN CROSSING TIME	5.3s	
TRAFFIC LINE ASSEMBLY		
TRAFFIC LANES	ONE	
PARKING LANES	2 x 2.1m | UNMARKED	
CYCLING PATH	N/A	
MEDIAN	N/A	
KERB TYPE/RADIUS	RAISED	3.0m
EFFECTIVE TURNING RADIUS	10m	
PUBLIC STREETSCAPE		
VERGE WIDTH	N/A	
FOOTPATH WIDTH	3.5m	
STREET TREE PLANTING	N/A	
Notes:		

STREET TYPOLOGIES

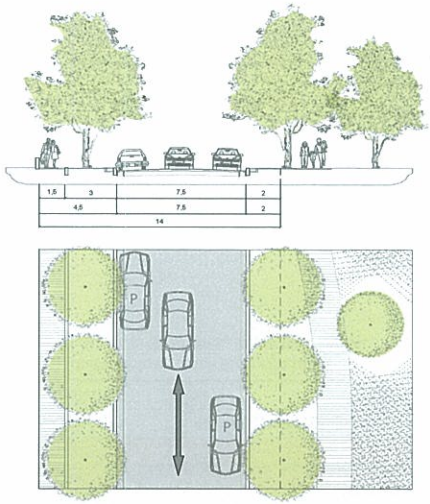
STREET 3: ST3-16-7.5





STREET 3 - ST3-16-7.5		
THOROUGHFARE SUMMARY		
ROAD RESERVE/PAVEMENT	16m	7.5m
TYPICALSPEED/MOVEMENT	30km/h	SLOW/YIELD
ROAD FUNCTION	ACCESS STREET 1	
PEDESTRIAN CROSSING TIME	5s	
TRAFFIC LINE ASSEMBLY		
TRAFFIC LANES	TWO	
PARKING LANES	2 x 2.1m | UNMARKED	
CYCLING PATH	N/A	
MEDIAN	N/A	
KERB TYPE/RADIUS	RAISED	3.0m
EFFECTIVE TURNING RADIUS	10m	
PUBLIC STREETSCAPE		
VERGE WIDTH	2.75m	
FOOTPATH WIDTH	1.5m	
STREET TREE PLANTING	FORMAL	
Notes:		

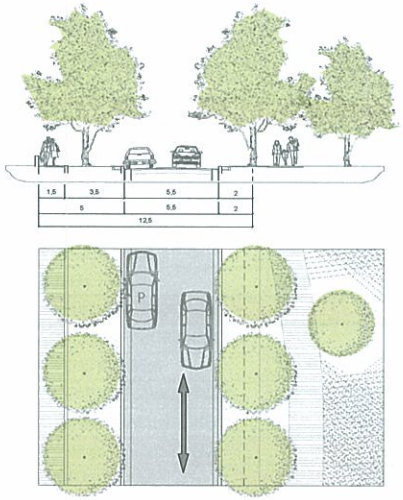
DRIVE 1: DR1-14-7.5

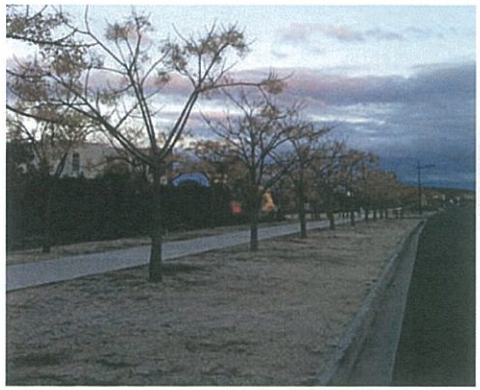


DRIVE 1 - DR1-14-7.5		
THOROUGHFARE SUMMARY		
ROAD RESERVE/PAVEMENT	14m	7.5m
TYPICAL SPEED/MOVEMENT	50km/h	SLOW/YIELD
ROAD FUNCTION	ACCESS STREET 1	
PEDESTRIAN CROSSING TIME	5s	
TRAFFIC LINE ASSEMBLY		
TRAFFIC LANES	ONE	
PARKING LANES	2@2.1m | UNMARKED	
CYCLING PATH	N/A	
MEDIAN	N/A	
KERB TYPE/RADIUS	RAISED	3.0m
EFFECTIVE TURNING RADIUS	10m	
PUBLIC STREETSCAPE		
VERGE WIDTH	4.5m (One Side)	
FOOTPATH WIDTH	1.5m	
STREET TREE PLANTING	FORMAL	
Notes:		

STREET TYPOLOGIES

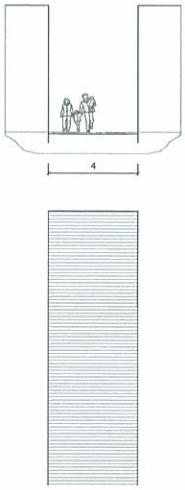
DRIVE 2: 12.5-5.5

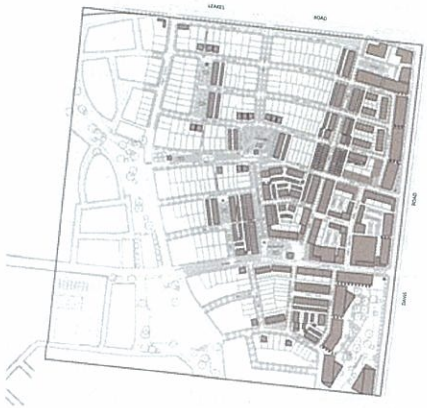




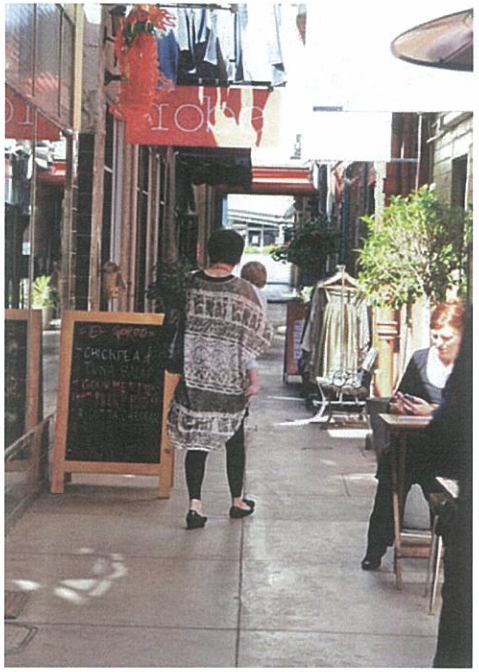
DRIVE 2 - DR2-12.5-5.5		
THOROUGHFARE SUMMARY		
ROAD RESERVE/PAVEMENT	12.5m	6m
TYPICAL SPEED/MOVEMENT	50kmh	SLOW/YIELD
ROAD FUNCTION	ACCESS PLACE 1	
PEDESTRIAN CROSSING TIME	4s	
TRAFFIC LINE ASSEMBLY		
TRAFFIC LANES	ONE	
PARKING LANES	2 x 2.1m / UNMARKED	
MEDIAN	N/A	
KERB TYPE/RADIUS	RAISED	3.0m
EFFECTIVE TURNING RADIUS	10m	
PUBLIC STREETSCAPE		
VERGE WIDTH	5m (One Side)	
FOOTPATH WIDTH	1.5m	
CYCLING PATH	N/A	
STREET TREE PLANTING	FORMAL	
Notes:		

WALK 1: WK1-4



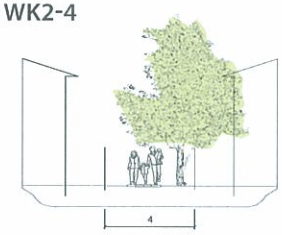


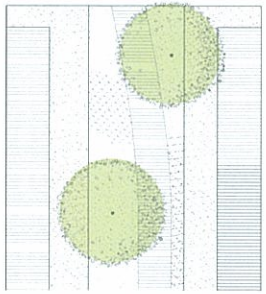
WALKWAY 1 - WK1 - 4m MIN.	
PUBLIC STREETSCAPE	
FOOTPATH WIDTH	4m - FULLY PAVED SPACE
STREET TREE PLANTING	N/A
Notes: Urban and active links. Small footprint retail opportunities allowing for small 'hole in the wall' shops.	

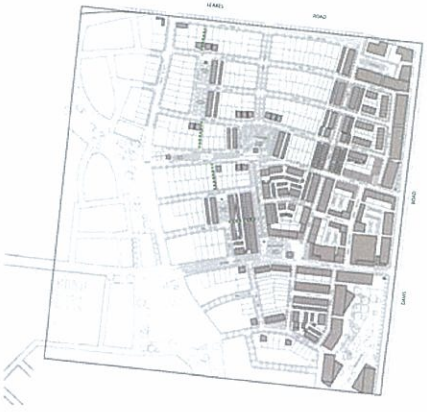


STREET TYPOLOGIES

WALK 2: WK2-4

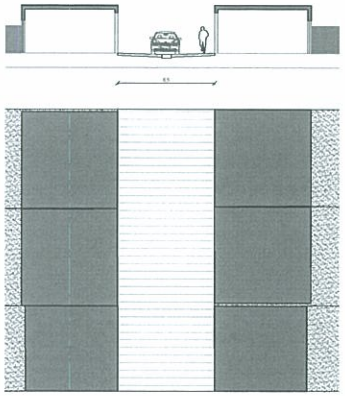






WALKWAY 2 - WK2 - 4m MIN.	
PUBLIC STREETSCAPE	
FOOTPATH WIDTH	2.5m
STREET TREE PLANTING	INFORMAL
Notes: Fencing treatment to encourage surveillance along with windows overlooking paths between homes. Paths should be direct through spaces and link to destinations.	

LANE 1: LN1-6.5

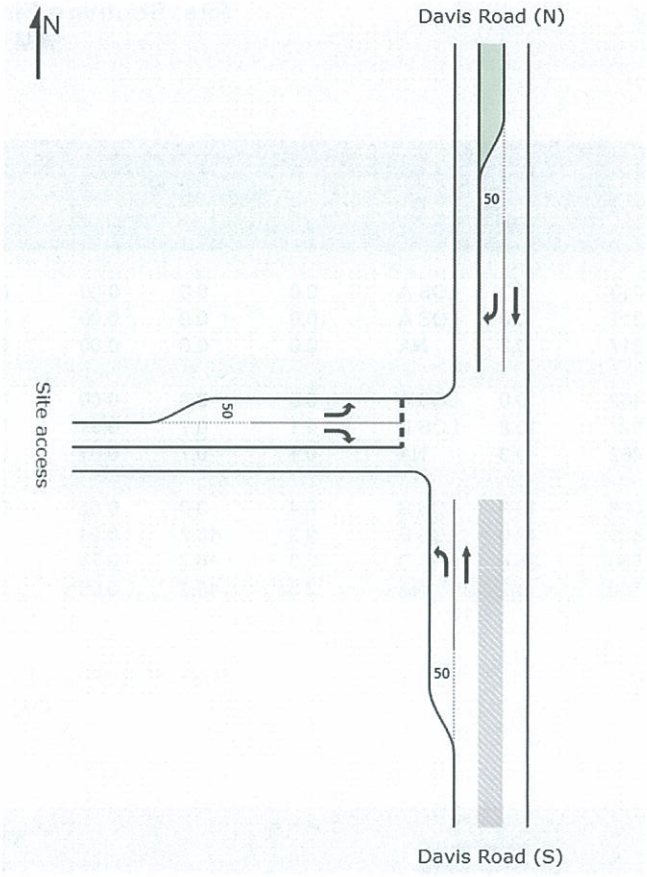


LANE 1 -LN1-6.5m		
THOROUGHFARE SUMMARY		
ROAD RESERVE/PAVEMENT	6.5m	6.5m
TYPICAL SPEED/MOVEMENT	10kmh	SLOW/YIELD
ROAD FUNCTION	ACCESS PLACE 1	
PEDESTRIAN CROSSING TIME	N/A - SHARED SPACE	
TRAFFIC LINE ASSEMBLY		
TRAFFIC LANES	ONE/YIELD	
PARKING LANES	N/A	
MEDIAN	N/A	
KERB TYPE/RADIUS	0.5m	N/A
EFFECTIVE TURNING RADIUS	TBD	
PUBLIC STREETSCAPE		
VERGE WIDTH	N/A	
FOOTPATH WIDTH	N/A	
CYCLING PATH	N/A	
STREET TREE PLANTING	FORMAL	
Notes:		

Appendix B

SIDRA INTERSECTION Result

Figure B1: Davis Road / Site Access Intersection Layout



MOVEMENT SUMMARY

Site: Southern Site Access - AM Immediate

Proposed Site Access
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Davis Road (S)											
1	L	24	4.0	0.013	8.3	LOS A	0.0	0.0	0.00	0.67	49.0
2	T	603	4.0	0.317	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		627	4.0	0.317	0.3	NA	0.0	0.0	0.00	0.03	59.5
North: Davis Road (N)											
8	T	879	4.0	0.462	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R	24	4.0	0.027	10.8	LOS B	0.1	0.7	0.51	0.72	46.3
Approach		903	4.0	0.462	0.3	NA	0.1	0.7	0.01	0.02	59.5
West: Site access											
10	L	97	4.0	0.098	10.8	LOS B	0.4	3.0	0.55	0.76	46.4
12	R	97	4.0	0.586	42.0	LOS E	2.3	16.7	0.94	1.09	27.8
Approach		194	4.0	0.586	26.4	LOS D	2.3	16.7	0.74	0.93	34.8
All Vehicles		1724	4.0	0.586	3.2	NA	2.3	16.7	0.09	0.12	55.1

MOVEMENT SUMMARY

Site: Southern Site Access - PM Immediate

Proposed Site Access
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Davis Road (S)											
1	L	73	4.0	0.040	8.3	LOS A	0.0	0.0	0.00	0.67	49.0
2	T	883	4.0	0.465	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		956	4.0	0.465	0.6	NA	0.0	0.0	0.00	0.05	59.0
North: Davis Road (N)											
8	T	773	4.0	0.407	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R	73	4.0	0.119	13.4	LOS B	0.4	3.1	0.66	0.89	43.9
Approach		845	4.0	0.407	1.2	NA	0.4	3.1	0.06	0.08	58.2
West: Site access											
10	L	48	4.0	0.070	12.8	LOS B	0.3	2.0	0.64	0.84	44.4
12	R	48	4.0	0.452	52.7	LOS F	1.5	10.7	0.95	1.04	24.5
Approach		97	4.0	0.452	32.7	LOS D	1.5	10.7	0.79	0.94	31.6
All Vehicles		1898	4.0	0.465	2.5	NA	1.5	10.7	0.07	0.11	56.2

MOVEMENT SUMMARY

Site: Nth Site Access - AM Immediate

Proposed Site Access
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Davis Road (S)											
1	L	24	4.0	0.013	8.3	LOS A	0.0	0.0	0.00	0.67	49.0
2	T	676	4.0	0.356	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		700	4.0	0.356	0.3	NA	0.0	0.0	0.00	0.02	59.5
North: Davis Road (N)											
8	T	806	4.0	0.424	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R	24	4.0	0.029	11.2	LOS B	0.1	0.8	0.54	0.75	45.9
Approach		831	4.0	0.424	0.3	NA	0.1	0.8	0.02	0.02	59.5
West: Site access											
10	L	97	4.0	0.106	11.3	LOS B	0.4	3.2	0.58	0.79	45.9
12	R	97	4.0	0.586	42.0	LOS E	2.3	16.7	0.94	1.09	27.8
Approach		194	4.0	0.586	26.6	LOS D	2.3	16.7	0.76	0.94	34.6
All Vehicles		1724	4.0	0.586	3.3	NA	2.3	16.7	0.09	0.13	55.1

MOVEMENT SUMMARY

Site: Nth Site Access - PM Immediate

Proposed Site Access
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Davis Road (S)											
1	L	73	4.0	0.040	8.3	LOS A	0.0	0.0	0.00	0.67	49.0
2	T	859	4.0	0.452	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		932	4.0	0.452	0.6	NA	0.0	0.0	0.00	0.05	59.0
North: Davis Road (N)											
8	T	797	4.0	0.419	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R	73	4.0	0.115	13.2	LOS B	0.4	3.1	0.64	0.89	44.1
Approach		869	4.0	0.419	1.1	NA	0.4	3.1	0.05	0.07	58.3
West: Site access											
10	L	48	4.0	0.068	12.6	LOS B	0.3	2.0	0.63	0.83	44.6
12	R	48	4.0	0.452	52.7	LOS F	1.5	10.7	0.95	1.04	24.5
Approach		97	4.0	0.452	32.6	LOS D	1.5	10.7	0.79	0.94	31.6
All Vehicles		1898	4.0	0.452	2.5	NA	1.5	10.7	0.06	0.11	56.2

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