990 Sayers Road, Tarneit
Section 96a Application
Riverdale PSP Area
Transport Impact Assessment

transportation planning, design and delivery

12M1834000 26/10/12

GTAconsultants

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Section 96a Application, Riverdale PSP Area

Transport Impact Assessment

Issue: C 26/10/12

Client: Satterley Property Group
Reference: 12M1834000
GTA Consultants Office: VIC

Quality Record

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

1.1 Background

A planning permit is currently being sought for a proposed residential subdivision on land located at 990 Sayers Road in Tarneit under a Section 96a Application. The overall development incorporates some 771 lots, whilst the Section 96a Application incorporates a total of 295 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 Satterley Property Group 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.

1.2 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.

1.3 References

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

- Wyndham Planning Scheme
- plans for the proposed development prepared by Watsons
- traffic surveys commissioned by GTA Consultants as referenced in the context of this report
- 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 Subject Site

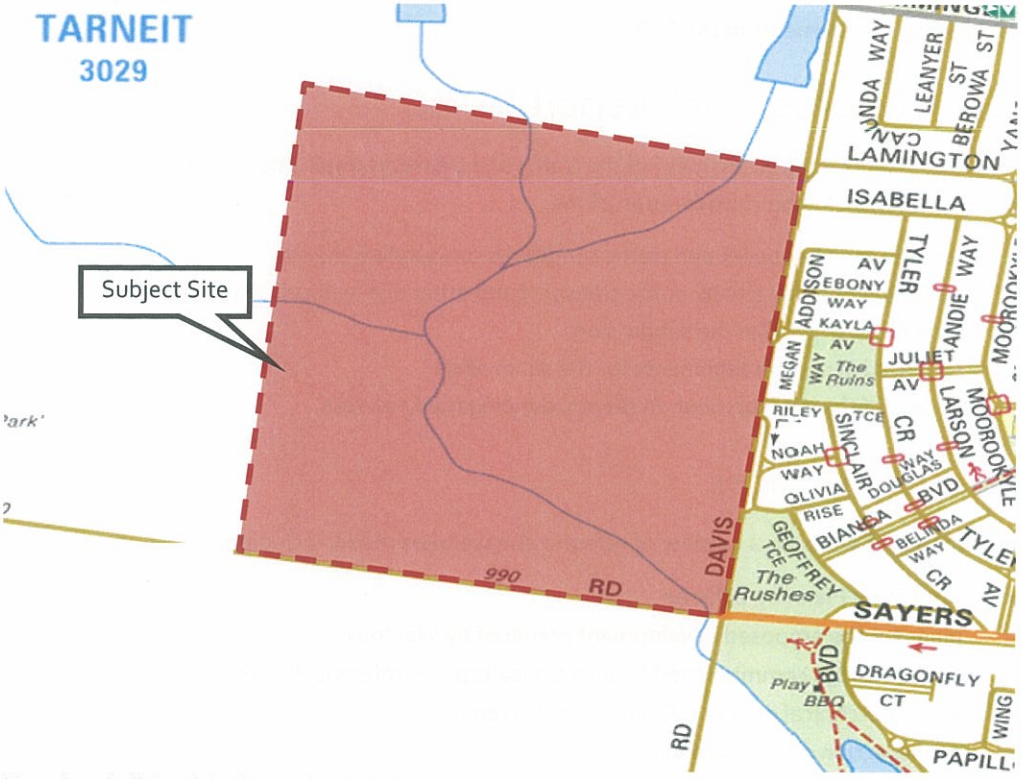
The subject site is located at 990 Sayers Road in Tarneit. The site of approximately 63.0ha has frontages of 800m to Sayers Road and 788m to Davis Road.

The site is located within an Urban Growth Zone and is currently unoccupied, with the exception of two dwellings to the south.

The surrounding properties include a mix of farming and residential land uses.

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

Figure 2.1: Subject Site and its Environs



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2.2 Road Network

2.2.1 Adjoining Roads

Sayers Road

Sayers Road functions as a local east-west street (Local Council) within the vicinity of the subject site and continues for some 20 kilometers to the east where it functions as an arterial road in some sections. It is a two-way road aligned configured with a single lane, 3.7 metre wide carriageway set within a 19.8 metre wide road reserve (approx.).

Sayers Road carries approximately 460 vehicles per day[1] and is shown in Figure 2.2 and Figure 2.3.

Figure 2.2: Sayers Road (Looking east)

Figure 2.3: Sayers Road (Looking west)

Davis Road

Davis Road functions as a local traffic street. 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 (approx.). Kerbside parking is not permitted.

Davis Road carries approximately 360 vehicles per day[1] and is shown in Figure 2.4 and Figure 2.5.

Figure 2.4: Davis Road (Looking north)

Figure 2.5: Davis Road (Looking south)

2.2.2 Surrounding Intersections

The key intersection in the vicinity of the site is Sayers Road / Davis Road (unsignalised X-intersection).

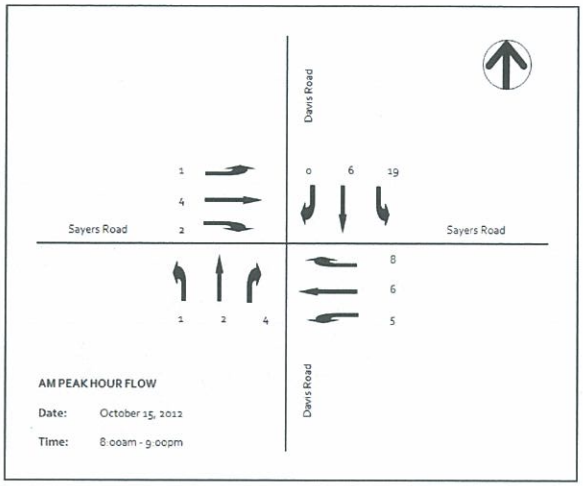
2.2.3 Traffic Volumes

GTA Consultants undertook traffic movement counts at the intersection of Sayers Road / Davis Road on Monday 15 October 2012 during the AM peak period (8:00am - 9:00am).

The AM peak hour traffic volumes are shown in Figure 2.6.

[1] Based on turning movement counts undertaken by GTA Consultants at the intersection of Sayers Road and Davis Road on 15 October 2012

Figure 2.6: Existing AM Peak Hour Traffic Volumes



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 CrashStats accident database. This database records all accidents causing injury that have occurred in Victoria since 1987 (as recorded by Victorian Police) and categorises these accidents as follows:

Based on this review, no accidents have been recorded in the vicinity of the site for the last available five year period (1 January 2007 to 31 December 2011).

2.3 Sustainable Transport Infrastructure

2.3.1 Public Transport

There are currently no public transport services operating within the vicinity of the subject site.

3. Riverdale PSP Area (draft)

3.1 Overview

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

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

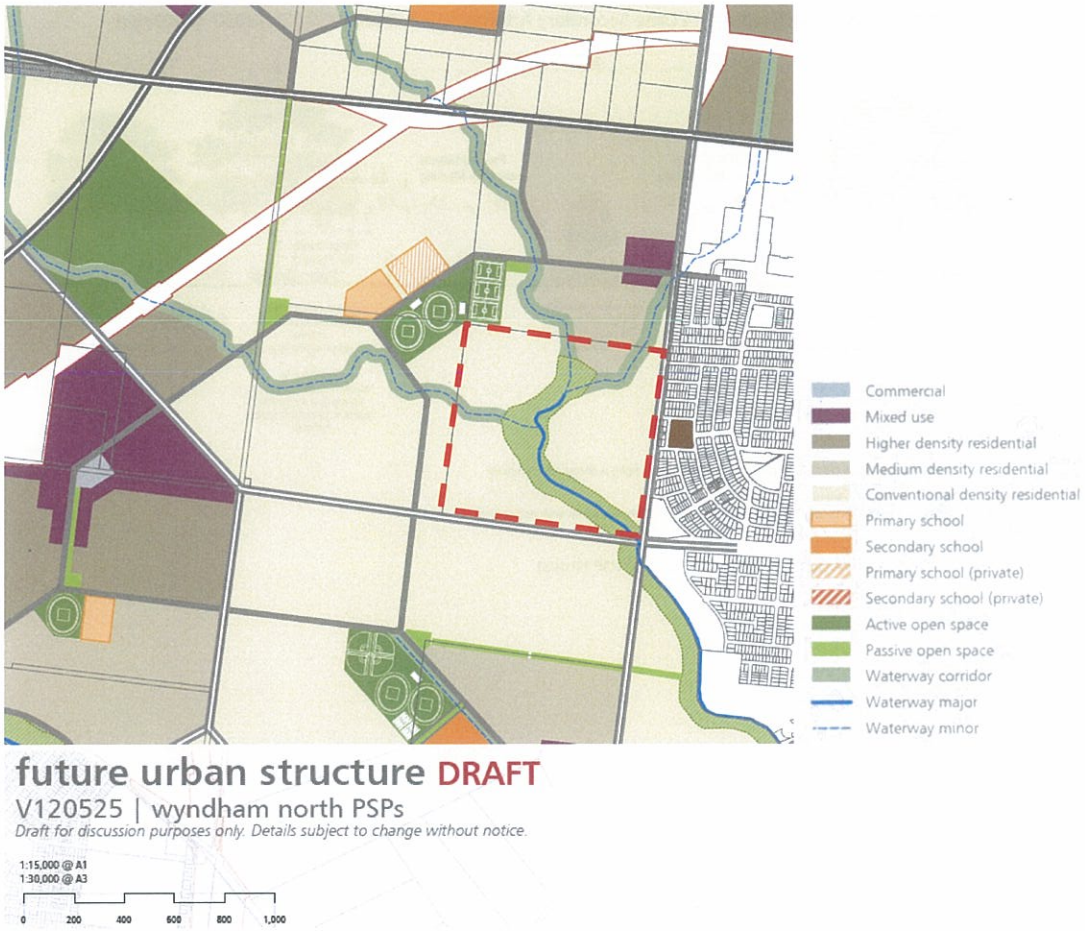


Figure 3.1 indicates that the site is earmarked for residential land uses. It is noted that Davis Creek passes through the site and is protected by areas of passive open space and a waterway corridor.

A local neighbourhood activity centre (mixed use land uses) is provided approximately 500m north of the site, two primary schools and active open space approximately 600m northwest of the site and two secondary schools approximately 1200m north and south of the site.

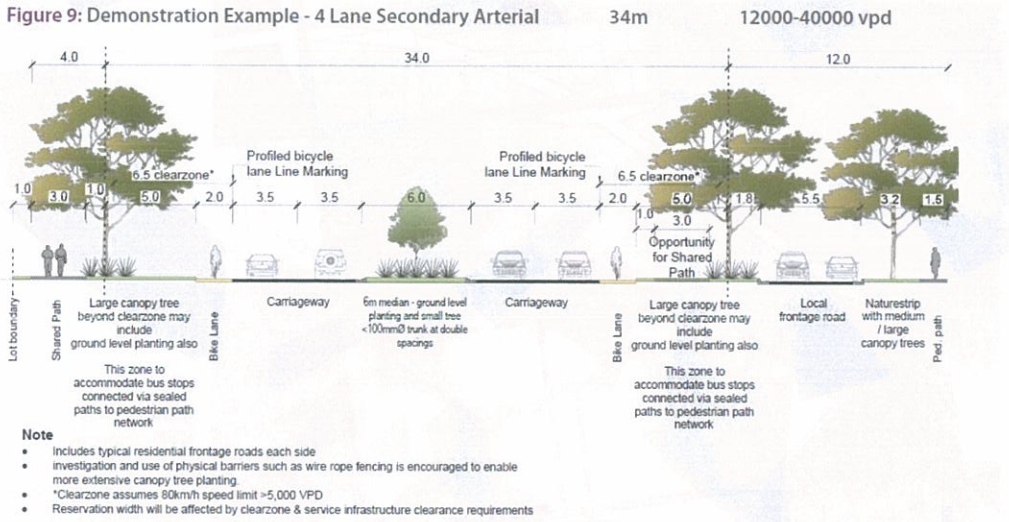
3.2 Road Network

The Future Urban Structure (draft) does not indicate any specific road network requirements for the site (i.e. provision of connector roads through the site). However, Davis Road to the east of the site and Sayers Road to the south are both proposed to be duplicated in the future. It is understood that Davis

Road is to be duplicated to the west of its existing alignment (i.e. within the subject site) and Sayers Road to the north of its existing alignment (i.e. within the subject site).

It is understood that in the future both of these roads are to be configured with 4 lane divided carriageways set within 34m road reserves. These roads will be classified as 'Secondary Arterial' roads and will be controlled by Council. The future anticipated cross-section of Sayers Road and Davis Road is illustrated in Figure 3.2.

Figure 3.2: 4-Lane Secondary Arterial Cross Section



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

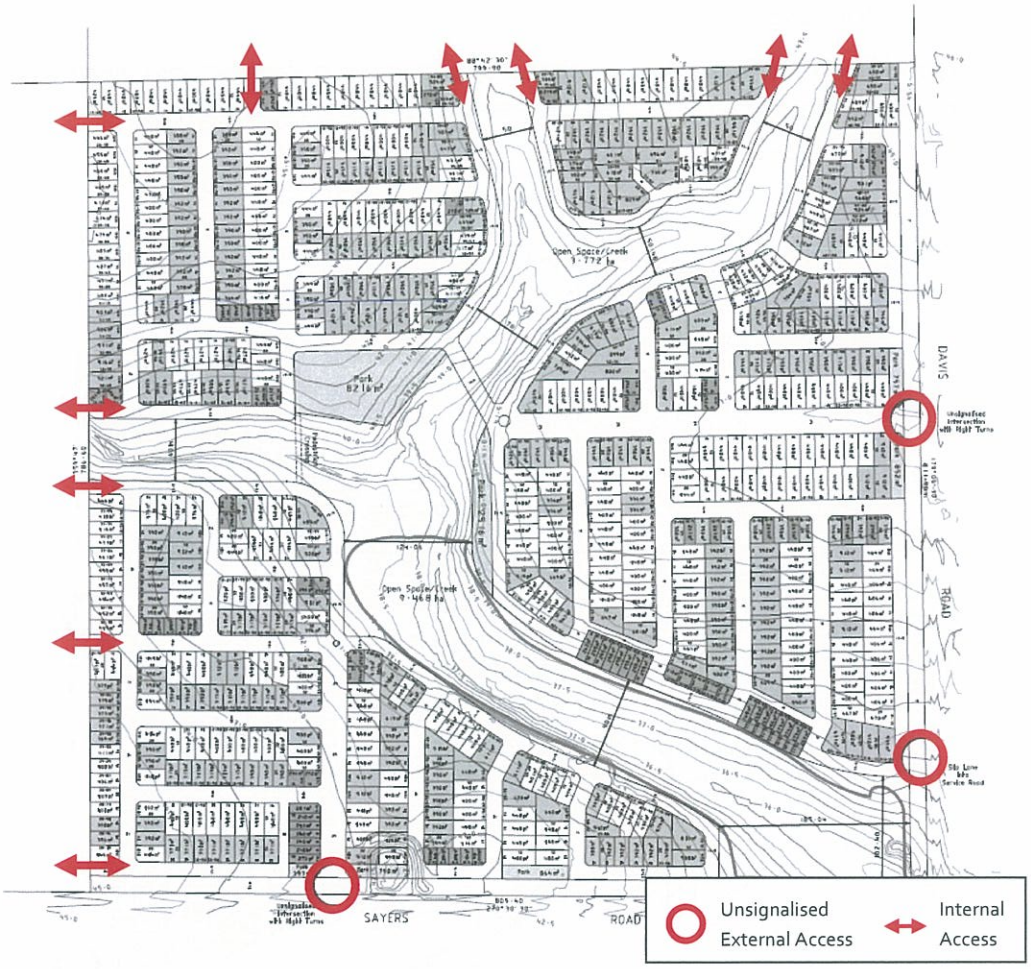
4. Development Proposal

4.1 Overall

4.1.1 Land Uses

The proposed development is to incorporate a residential subdivision of 773 lots, incorporating traditional and medium density lots. The proposed subdivision layout is illustrated in Figure 4.1.

Figure 4.1: Overall – Subdivision Layout



4.1.2 Vehicle Access and Internal Circulation

As indicated in Figure 4.1 vehicle access to the residential subdivision is provided via three unsignalised access points to Davis Road and Sayers Road, as follows:

- Davis Road (440m north of Sayers Road): full turning movements ("Type C" treatment)
- Davis Road (110m north of Sayers Road): left in only to service road
- Sayers Road (560m west of Davis Road): full turning movements ("Type C" treatment)

The main unsignalised access points to Davis Road and Sayers Road are to maintain full turning movements following the duplication of these roads.

In addition to the above external intersections, vehicle access is proposed to the subdivisions to the north and west of the site, as follows:

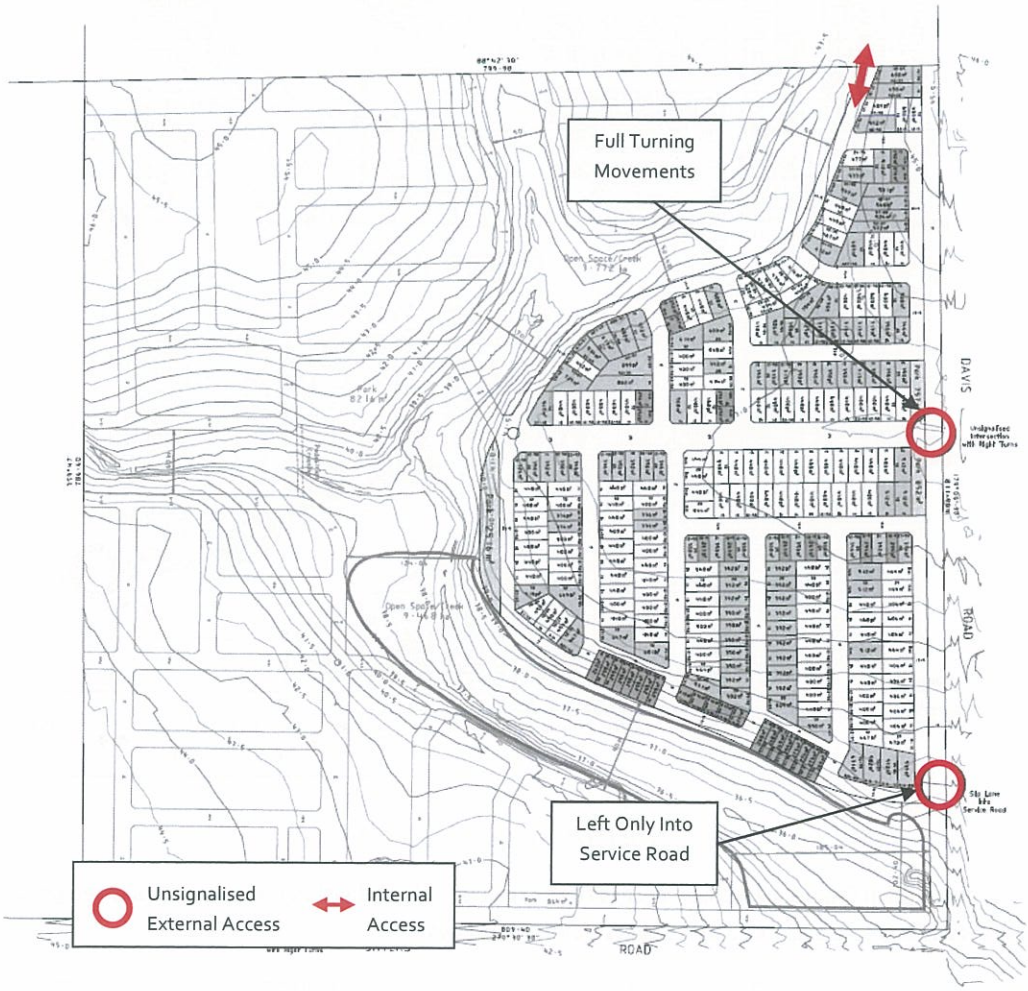
- 4 access street level 1 connections to the west
- 5 access street level 1 connections to the north

4.2 Section 96a Application

4.2.1 Land Uses

The Section 96a Application incorporates a residential subdivision of 295 lots, incorporating traditional and medium density lots. The proposed subdivision layout is illustrated in Figure 4.2.

Figure 4.2: Overall – Subdivision Layout



4.2.2 Vehicle Access

Vehicle access is proposed at two locations to Davis Road as described above.

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 Notes "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 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 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, except roads with reserve frontages. 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.

5.3 Cycling

PSP Requirements

The 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 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. It is noted that 2m wide bike lanes will be provided within the duplicated cross-sections of Davis Road and Sayers Road.

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 specific public transport requirements within the draft Future Urban Structure.

Compliance with PSP Requirements

Given that there is no connector roads proposed to run through the site, it is not anticipated that any bus services will operate within the site. Reference to the West Growth Corridor plan indicates that both Davis Road and Sayers Road are earmarked to form part of the Principal Public Transport Network. Therefore it is envisaged that in the future there will be a high frequency of bus services past the site frontages. In addition bus services are anticipated to operate along the connector road network in the neighbouring sites to the west and north.

The road network provided as part of the PSP means that the DoT recommendation that dwellings be located within 400m of a bus route cannot be achieved.

5.5 Road Network

PSP Requirements

The 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 PSP notes recommend that local access streets *"length should be limited to approximately 240m"*. The PSP notes also provide guidance on recommended cross-sections for each of the various road types.

Compliance with PSP Requirements

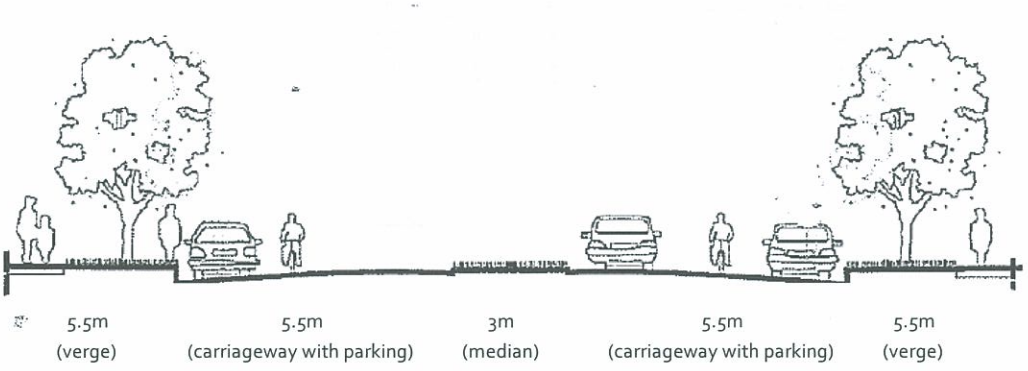
Table 5.1 provides a summary of the proposed internal road hierarchy. The proposed cross-sections are consistent with the standard GAA cross-sections. It is noted that the Access Street road reserves located adjacent to reserve frontages have been reduced from 16m to 13.5m.

Table 5.1: Proposed Internal Road Hierarchy

Street Type	Proposed Road Reservation	Carriageway Width	Parking Provision	Pedestrian and Cyclist Provisions	Anticipated Daily Volume
Access Lane	8m	5.5m (tbc)	None	None	Up to 300vpd
Access Street – Level 1 (reserve frontage)	13.5m	7.3m	Kerbside parking on both sides	Pedestrian paths on development side only	Up to 2,000vpd
Access Street – Level 1	16m	7.3m	Kerbside parking on both sides	Pedestrian paths on both sides of road	Up to 2,000vpd
Access Street – Level 2 (refer Figure 5.1)	25m [1]	2 x 5.5m (3m median)	Kerbside parking on both sides	Pedestrian paths on both sides of road	Up to 3,000vpd

[1] 25m Road Reserve: Cross-section 5.5m verges, 5.5m carriageway (including 2.1m parking lane) and 3m median.

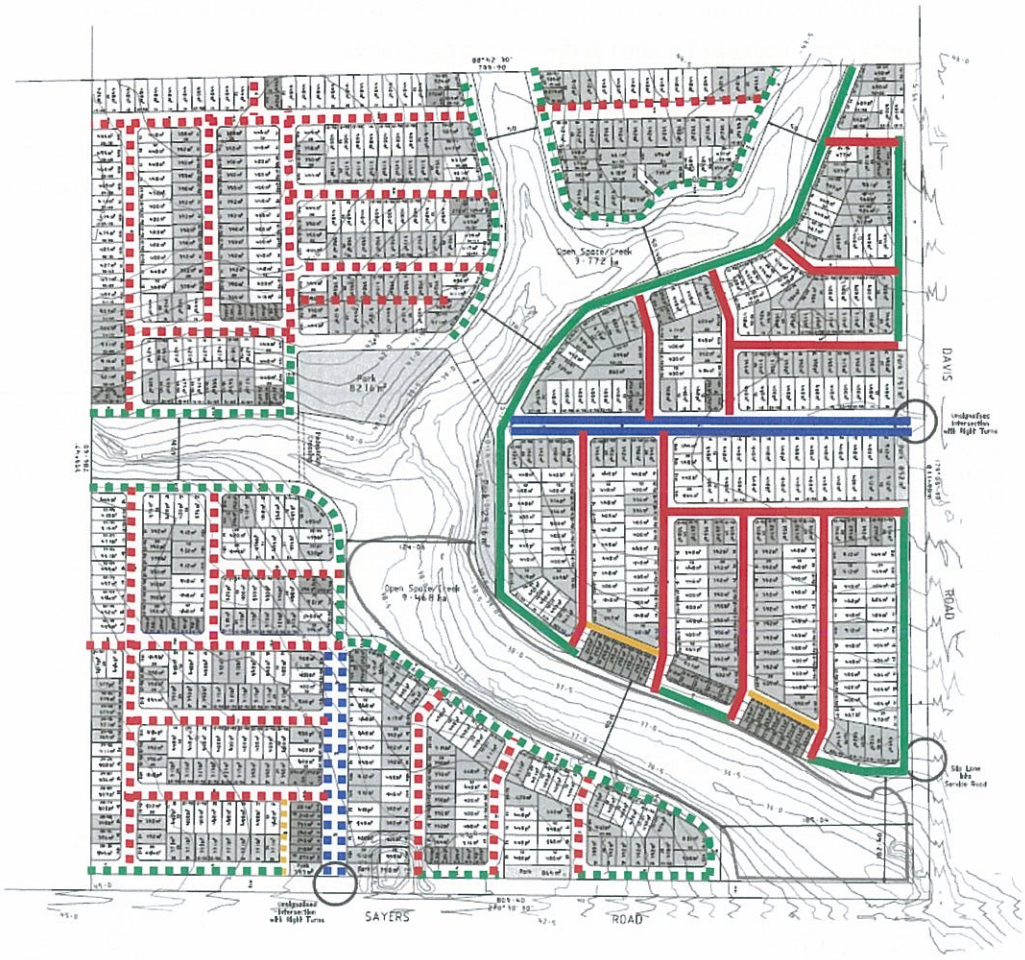
Figure 5.1: 25m Road Reserve Indicative Cross-Section



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 above.

Figure 5.2 has been prepared to summarise the proposed road hierarchy within the subject site.

Figure 5.2: Proposed Road Hierarchy



5.6 External Intersections

As discussed in Section 4, two intersections are proposed to the external road network to Davis Road and Sayers Road. The proposed intersections to Davis Road is located 440m north of the proposed Sayers Road / Davis Road signalised intersection and 600m south of the proposed Davis Road / Connector Street signalised intersection to the north. The proposed intersections to Sayers Road is located 560m west of the proposed Sayers Road / Davis Road signalised intersection and 340m east of the proposed Sayers Road / Connector Street signalised intersection to the west. The service road access from Davis Road is located 100m north of the Sayers Road / Davis Road intersection.

Referencing the VicRoads Access Management Policy (May 2006) and assuming AMP3 type roads for Davis Road and Sayers Road the above 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 site 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.

6.2.1 Overall

Based on the above, Table 6.1 sets out traffic generation estimates for both peak hour and daily periods for the overall site.

Table 6.1: Estimated Development Traffic Generation

Access	No. of Dwellings	Design Generation Rates		Traffic Generation Estimates	
		Peak Hour [1]	Daily	Peak Hour	Daily
To/from Site	773	0.6 vehicle movements / dwelling	6 vehicle movements / dwelling	464 vehicle movements / hour	4,638 vehicle movements / day

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

Table 6.1 indicates the proposed development could be expected to generate approximately 4,600 vehicle movements per day and 460 vehicle movements during each respective peak hour on a typical weekday.

As discussed previously the above traffic generation is generally consistent with that assumed as part of the overall PSP.

6.2.2 Section 96a Application

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

Table 6.2: Estimated Development Traffic Generation

Access	No. of Dwellings	Design Generation Rates		Traffic Generation Estimates	
		Peak Hour [1]	Daily	Peak Hour	Daily
To/from Davis Road	295	0.8 vehicle movements / dwelling	8 vehicle movements / dwelling	236 vehicle movements / hour	2,360 vehicle movements / day

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

Table 6.2 indicates the proposed development could be expected to generate approximately 2,400 vehicle movements per day and 240 vehicle movements during each respective peak hour on a typical weekday.

The following traffic impact assessment has been prepared to assess the impact of the Section 96a Application, noting that a traffic impact assessment for the overall site has been undertaken as part of the PSP process.

6.3 Traffic Distribution

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 north of the site 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 Section 96a Application lots[2].

Having consideration to the above, for the purposes of estimating vehicle movements, the following directional distributions have been assumed:

- 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, Figures 6.1 and 6.2 have been prepared to show the estimated marginal increase in turning movements in the vicinity of the subject property following full site development.

[2] Based on discussions with GAA.

Figure 6.1: AM Peak Hour Traffic Volumes (Site Generated)

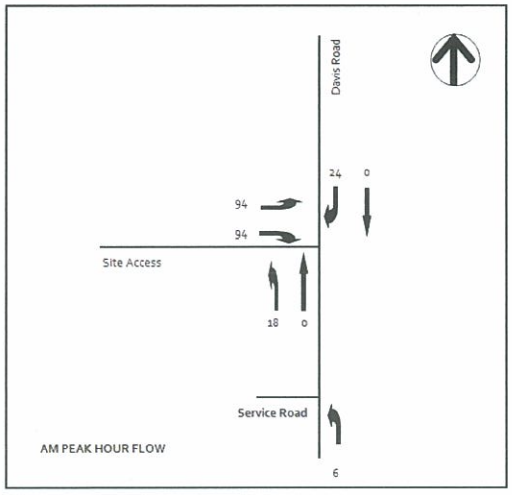
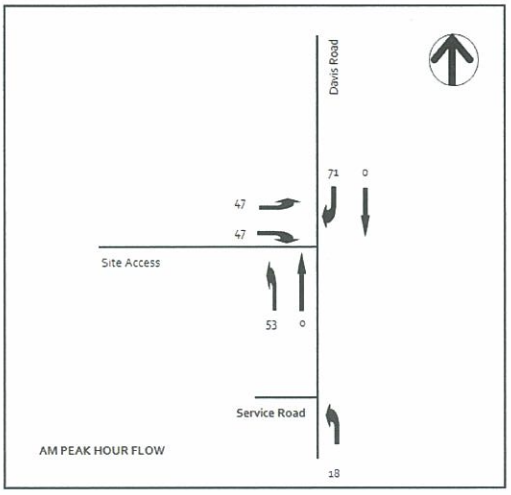


Figure 6.2: PM Peak hour Traffic Volumes (Site Generated)



6.4 Traffic Impact – Peak Hour

Traffic Volumes

In order to assess the future traffic performance of the proposed site access point on Davis Road, future traffic volumes have been obtained from MITM modelling undertaken by AECOM. The MITM model 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 initioal 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 Traffic Volumes (Future Traffic)

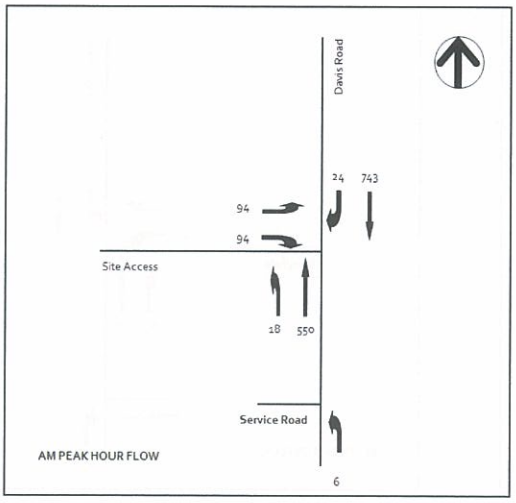
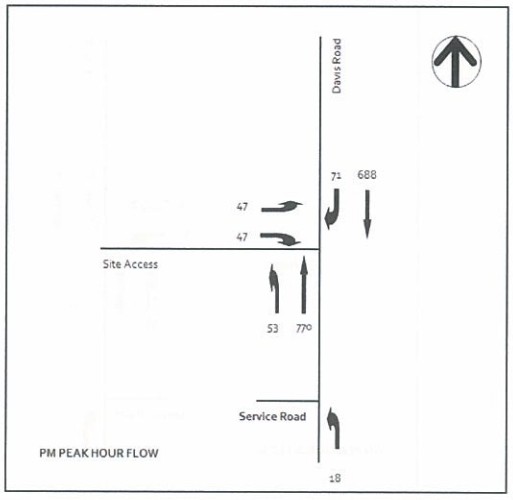


Figure 6.4: PM Peak Hour Traffic Volumes (Post Development)



Intersection Layouts

A "Type C" intersection treatment has been assumed at the Davis Road access point for assessment purposes, as illustrated in Figure 6.5.

Ultimately the Davis Road / Site Access intersection will be configured with two through lanes in each direction and left and right turn lanes into the site access road. The right turn will be accommodated within the 6m median, whilst the road reserve will need to be widened by 3.5m to the west to accommodate the left turn deceleration lane. Reference to AustRoads indicates that a 55m deceleration lane (20m taper and 35m storage) is required for a 60km/h road. This flaring will be accommodated within the area labelled "park" on the subdivision plan[3].

In addition an indicative layout for the slip lane entrance (left turn only) from Davis Road is provided in Figure 6.6. It is envisaged that the service road would have priority at this intersection.

[3] It is noted that the 12m wide park area is 64m long and as such the widened road reserve can be accommodated entirely within the park reserve.

Figure 6.5: Davis Road / Site Access Intersection Layout

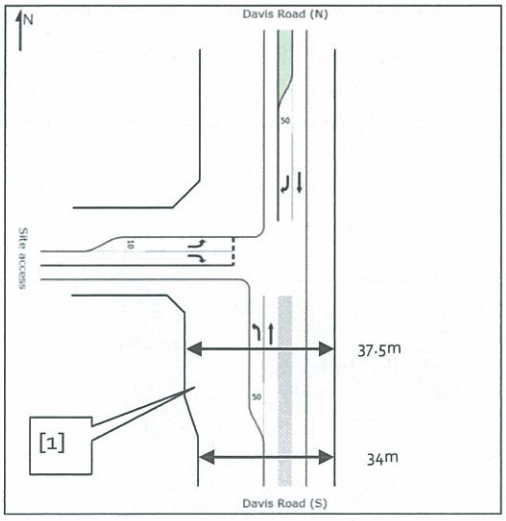
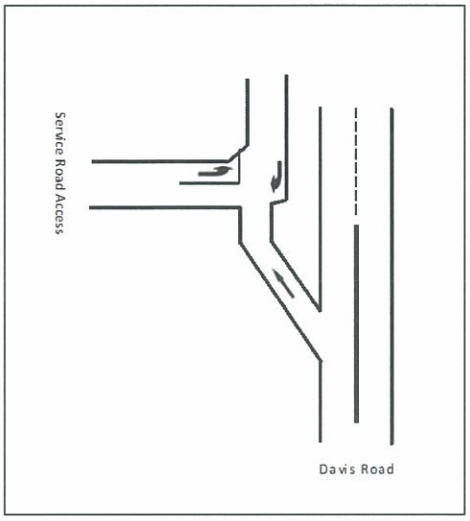


Figure 6.6: Davis Road / Service Road Access (left in only)



[1] Road reserve to be widened by 3.5m for 35m storage plus 20m taper to cater for left turn deceleration lane for ultimate scenario.

Unsignalised Intersections

The operation of the intersection of Davis Road and the site access has been assessed using *SIDRA INTERSECTION*[4], a computer based modelling package which calculates intersection performance.

The commonly used measure of intersection performance is referred to as the *Degree of Saturation (DOS)*. The DOS represents the flow-to-capacity ratio for the most critical movement on each leg of the intersection. For unsignalised intersections, a DOS of around 0.90 has been typically considered the practical limit, beyond which queues and delays increase disproportionately[5].

The results of this analysis are set out in Table 6.3, and indicate the proposed unsignalised access points can be expected to operate satisfactorily.

Table 6.3: Site Access Intersection – Future Intersection Operation in Peak Hours

Peak Hour	Approach	DOS	Average Delay (sec)	95th Percentile Queue (m)
AM	Davis Road (S)	0.31	0	0
	Davis Road (N)	0.41	0	1
	Site Access	0.49	22	14
PM	Davis Road (S)	0.43	1	0
	Davis Road (N)	0.38	1	3
	Site Access	0.37	27	9

DOS – Degree of Saturation, # - Intersection DOS

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

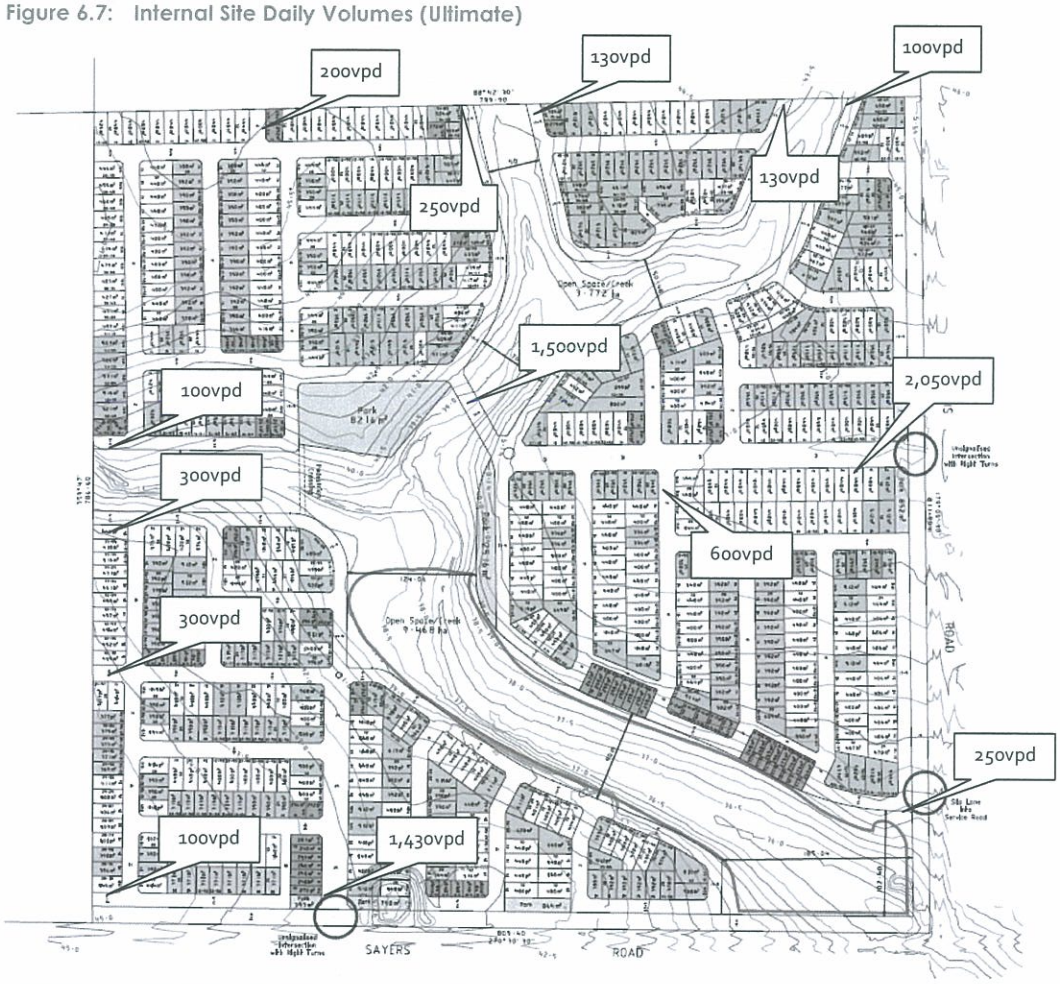
[5] SIDRA INTERSECTION adopts the following criteria for Level of Service assessment:

		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

6.5 Traffic Impact - Daily

On the basis of the anticipated site-generated traffic volumes presented in Section 6.2, it is anticipated that the internal road network will accommodate in the order of 4,600 vehicle movements per day. The anticipated internal daily traffic volumes 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 6.7: Internal Site Daily Volumes (Ultimate)



(adopting a daily traffic generation rate of 6 movements per day)

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 overall development is anticipated to generate approximately 4,600 vehicle movements per day and 460 vehicle movements per hour in the peak periods.

ii The Section 96a Application area (295 dwellings) is anticipated to generate approximately 2,400 vehicle movements per day and 240 vehicle movements per hour in the peak periods.

iii An unsignalised intersection to Davis Road (full turning movements) and service road access to Davis Road (left in only) are provided to the Section 96a Application area.

iv There is adequate capacity at the proposed Davis Road / Site access intersection to accommodate the Section 96a Application traffic.

v There will be sufficient capacity within the surrounding future road network to accommodate the overall site generated traffic, noting that this will be assessed as part of the Riverdale PSP.

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

vii There is no requirement to accommodate buses on the internal subdivision road network however, the site will be serviced by future anticipated bus routes operating on Sayers Road, Davis Road and the connector roads to the north and west of the site.

viii 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

VITM Modelling (AECOM)

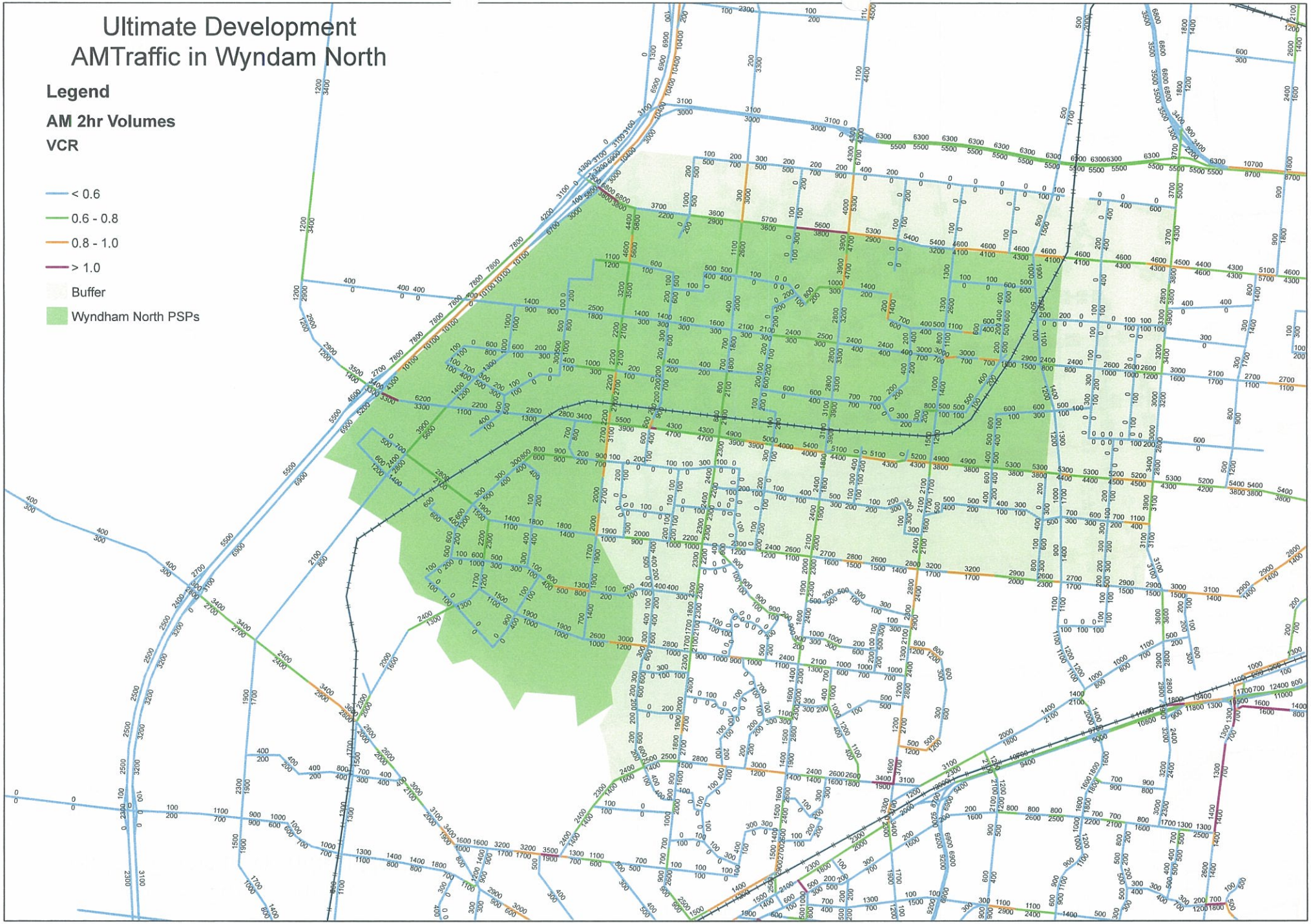
Ultimate Development
AMTraffic in Wyndam North

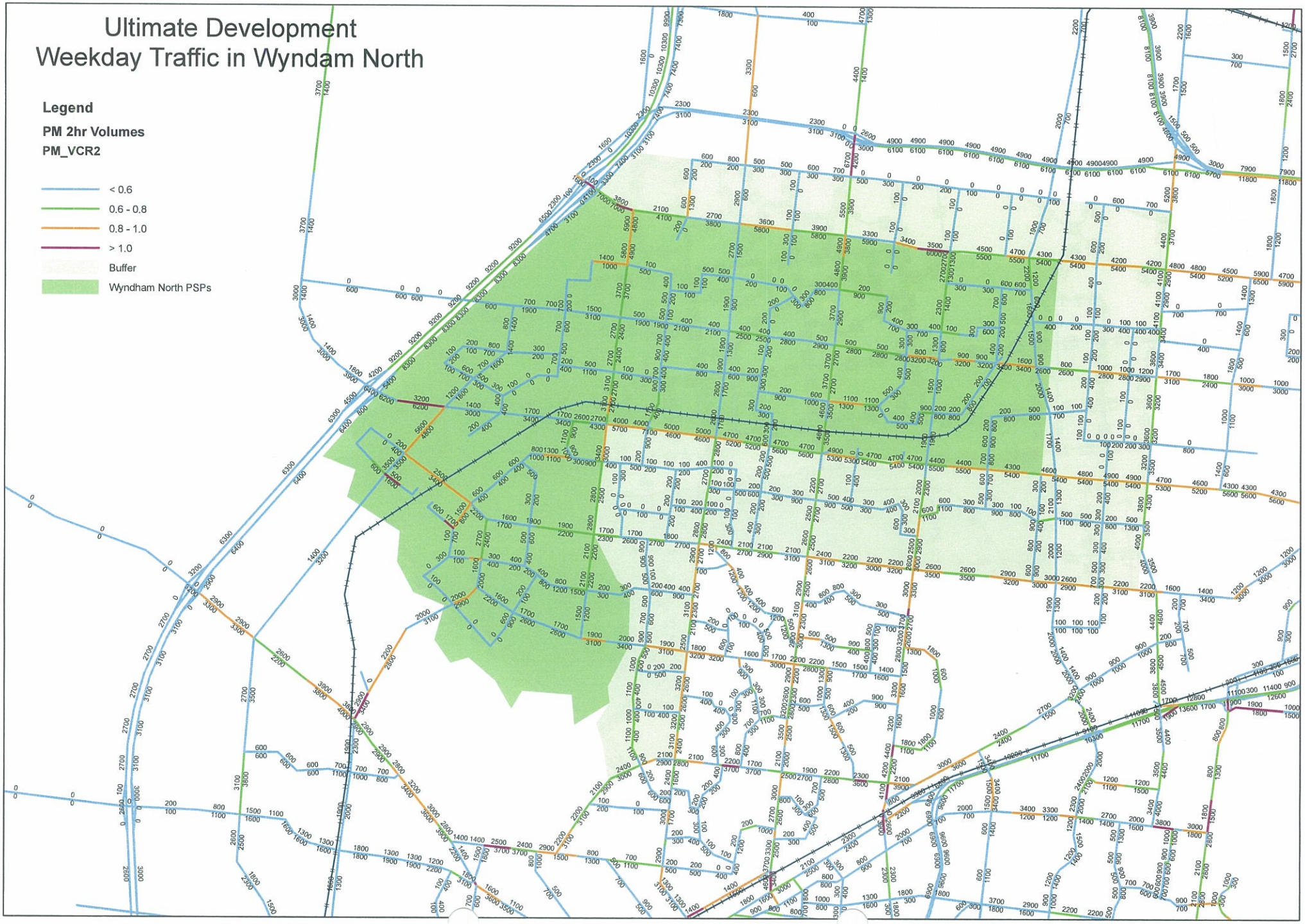
Legend

AM 2hr Volumes

VCR

- < 0.6
- 0.6 - 0.8
- 0.8 - 1.0
- > 1.0
- Buffer
- Wyndham North PSPs




Ultimate Development
Weekday Traffic in Wyndam North
Legend
PM 2hr Volumes
PM_VCR2
< 0.6
0.6 - 0.8
0.8 - 1.0
> 1.0
Buffer
Wyndham North PSPs

Appendix B

SIDRA INTERSECTION Results

AM Peak Hour

MOVEMENT SUMMARY

Site: Site Access - AM Future

Proposed Site Access
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Davis Road (S)											
1	L	19	4.0	0.010	8.3	LOS A	0.0	0.0	0.00	0.67	49.0
2	T	579	4.0	0.305	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		598	4.0	0.305	0.3	NA	0.0	0.0	0.00	0.02	59.6
North: Davis Road (N)											
8	T	782	4.0	0.412	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R	25	4.0	0.027	10.7	LOS B	0.1	0.7	0.50	0.72	46.5
Approach		807	4.0	0.412	0.3	NA	0.1	0.7	0.02	0.02	59.5
West: Site access											
10	L	99	4.0	0.170	10.7	LOS B	0.4	3.0	0.54	0.75	46.5
12	R	99	4.0	0.469	32.6	LOS D	1.9	13.7	0.91	1.06	31.5
Approach		198	4.0	0.469	21.7	LOS C	1.9	13.7	0.72	0.90	37.6
All Vehicles		1603	4.0	0.469	2.9	NA	1.9	13.7	0.10	0.13	55.5

Level of Service (LOS) Method: Delay (HCM 2000)
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model used.

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SIDRA INTERSECTION

PM Peak Hour

MOVEMENT SUMMARY

Site: Site Access - PM Future

Proposed Site Access
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Davis Road (S)											
1	L	56	4.0	0.031	8.3	LOS A	0.0	0.0	0.00	0.67	49.0
2	T	811	4.0	0.426	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		866	4.0	0.426	0.5	NA	0.0	0.0	0.00	0.04	59.1
North: Davis Road (N)											
8	T	724	4.0	0.361	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R	75	4.0	0.109	12.7	LOS B	0.4	2.9	0.61	0.67	44.6
Approach		799	4.0	0.361	1.2	NA	0.4	2.9	0.06	0.08	58.1
West: Site access											
10	L	49	4.0	0.101	12.2	LOS B	0.3	1.9	0.61	0.61	45.1
12	R	49	4.0	0.367	40.6	LOS E	1.2	8.7	0.93	1.02	28.2
Approach		99	4.0	0.367	26.5	LOS D	1.2	8.7	0.77	0.82	34.7
All Vehicles		1764	4.0	0.426	2.3	NA	1.2	8.7	0.07	0.11	56.5

Level of Service (LOS) Method: Delay (HCM 2000)
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model used.

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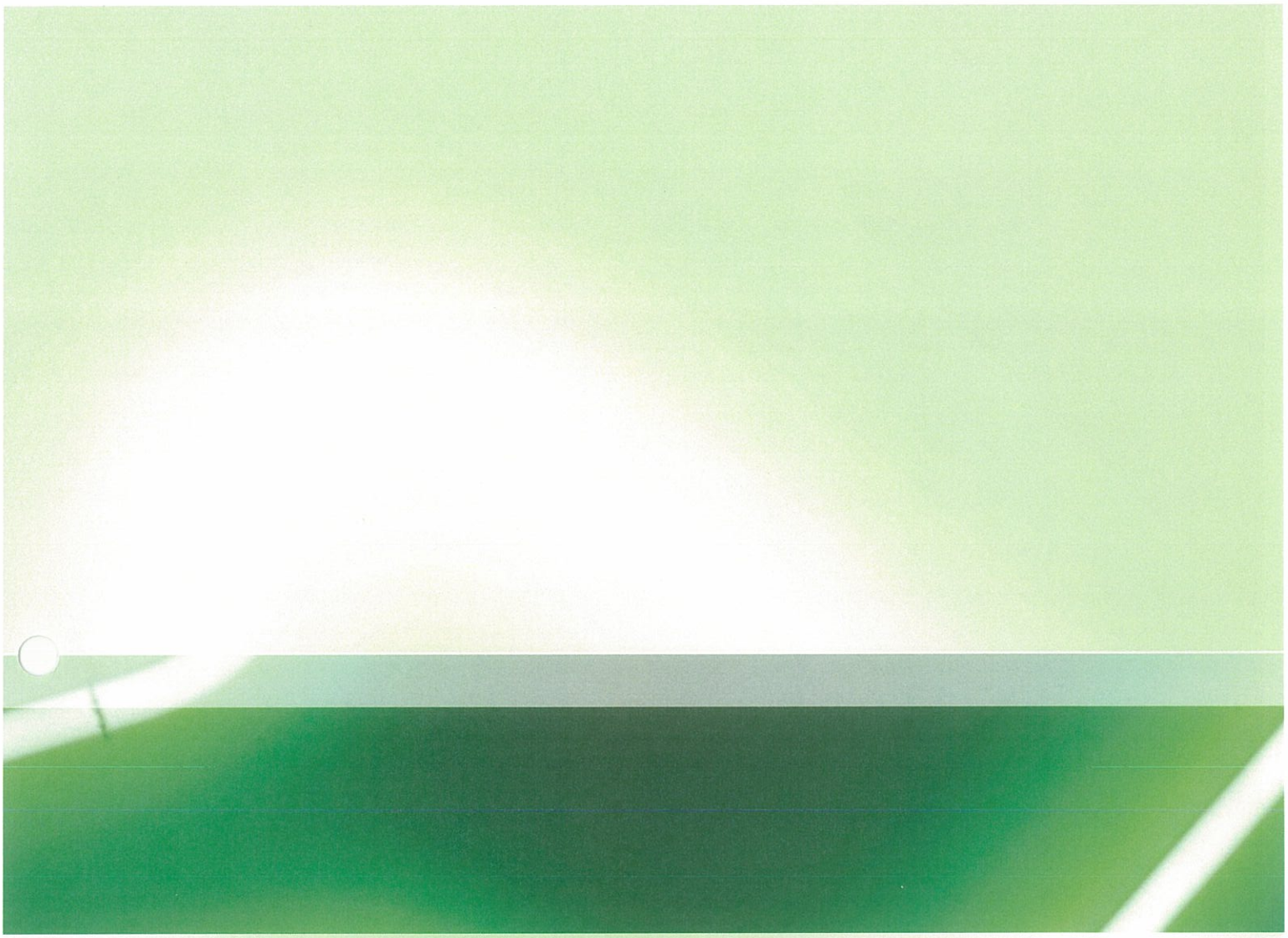
SIDRA INTERSECTION



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