

This report only relates to the advertising of the Hatch Court Light Industrial Area, all references contained in this report to the Stirling Crescent Precinct should therefore be disregarded.

PTG/02687

Transport Impact Assessment Hatch Court Light Industrial Area Local Structure Plan

16 July 2026 | Revision F

Prepared for Dynamic Planning and Developments Pty Ltd

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REPORT DETAILS

Document Title	Transport Impact Assessment – Hatch Court Light Industrial Area Local Structure Plan
Project Number	PTG/02687
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F	16 July 2026	Minor update	DR	SJL

1 INTRODUCTION

1.1 Background

PTG Consulting Pty Ltd (PTG) has been commissioned by Dynamic Planning and Developments Pty Ltd to prepare a Transport Impact Assessment (TIA) for the proposed Hatch Court Local Structure Plan (LSP) located at Lots 51, 9, 15, 19, 23, 27, 29, 30, 26, 24, 14 Hatch Court, Lots 20, 26, 30, 34, 38, 42, 46, 50, 54, 58, 62, 29, 37, 51 Stirling Crescent, and Lots 584 and 614 Kalamunda Road in High Wycombe in the City of Kalamunda, WA (“the Site”).

This report has been prepared in accordance with the *Western Australian Planning Commission (WAPC) Transport Assessment Guidelines for Developments: Volume 2 – Planning Schemes, Structure Plans and Activity Centre Plans (2016)* and the Transport Impact Assessment (TIA) Checklist is included at **Appendix A – WAPC Checklist**.

Specifically, this report aims to assess the operations of the proposed Local Structure Plan (LSP) internally and its connections to the adjacent road network, with a focus on traffic volumes, access and accessibility.

This report also outlines the requirements and opportunities associated with traffic and transport within the development, referencing relevant Council and WAPC policies and guidelines as well as best-practice planning within Western Australia.

2 STRUCTURE PLAN PROPOSAL

2.1 Regional Context

The Site is located approximately 3km north of the Maddington Kenwick Strategic Employment Area, 500m from the Hazelmere Industrial Area, 3km northeast of Perth Airport, and 4km from the High Wycombe Train Station, as shown in Figure 1.

Figure 1 Site Location Context



Source: Landgate (2026)

2.2 Site Location

The Site is located at Lots 51, 9, 15, 19, 23, 27, 29, 30, 26, 24, 14 Hatch Court, Lots 20, 26, 30, 34, 38, 42, 46, 50, 54, 58, 62, 29, 37, 51 Stirling Crescent, and Lots 584 and 614 Kalamunda Road, High Wycombe, WA. **Figure 2** shows the location of the proposed structure plan area.

Figure 2 Site Location

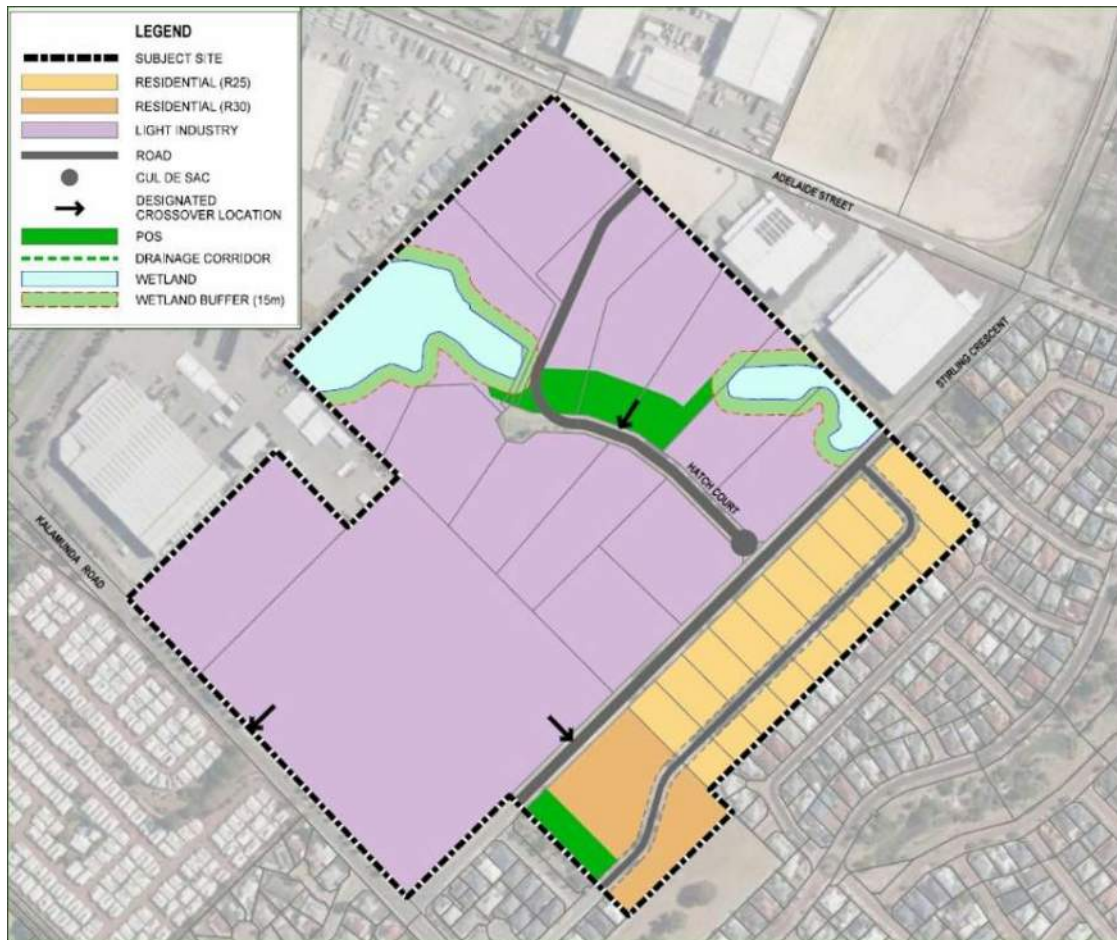


Source: Metromap (2026)

2.3 Proposed Land Uses

The development concept plan is illustrated in Figure 3.

Figure 3 Proposed Local Structure Plan Area



Source: Dynamic Planning and Developments Pty Ltd (June 2026)

2.4 Table of Land Uses and Quantities

The proposed land uses and yields are shown in Table 1. It is noted that existing road reserves are not included in the values presented below.

Table 1 Proposed Land Uses

Proposed Land Uses	Yield
Light Industrial	21.5700 ha
Residential	4.9126 ha (estimated yield of 140 residential lots)
New Road Reserves	1.4088 ha
Public Open Space/Drainage	0.2900 ha
Wetlands and Buffer	3.0591 ha
Wetlands and Buffer	0.6415 ha
Total Structure Plan Area	31.8820 ha

2.5 Major Attractors/Generators

Major attractors and generators within the area surrounding the Site are shown in Figure 4.

Figure 4 Major Attractors/Generators within the Surrounding Area



Source: Metromap (2026)

2.6 Specific Issues

Due to the significant traffic volume, other regional road status and existing residential developments fronting Kalamunda Road adjacent to the LSP site, access directly from the Kalamunda Road frontage of the industrial lots is to be limited to a single crossover, proposed to remain as currently located. According to WAPC Development Control Policy 5.1, where alternative access is or could be made available from side or rear streets or from rights of way, no access shall be permitted to the regional road unless special circumstances apply.

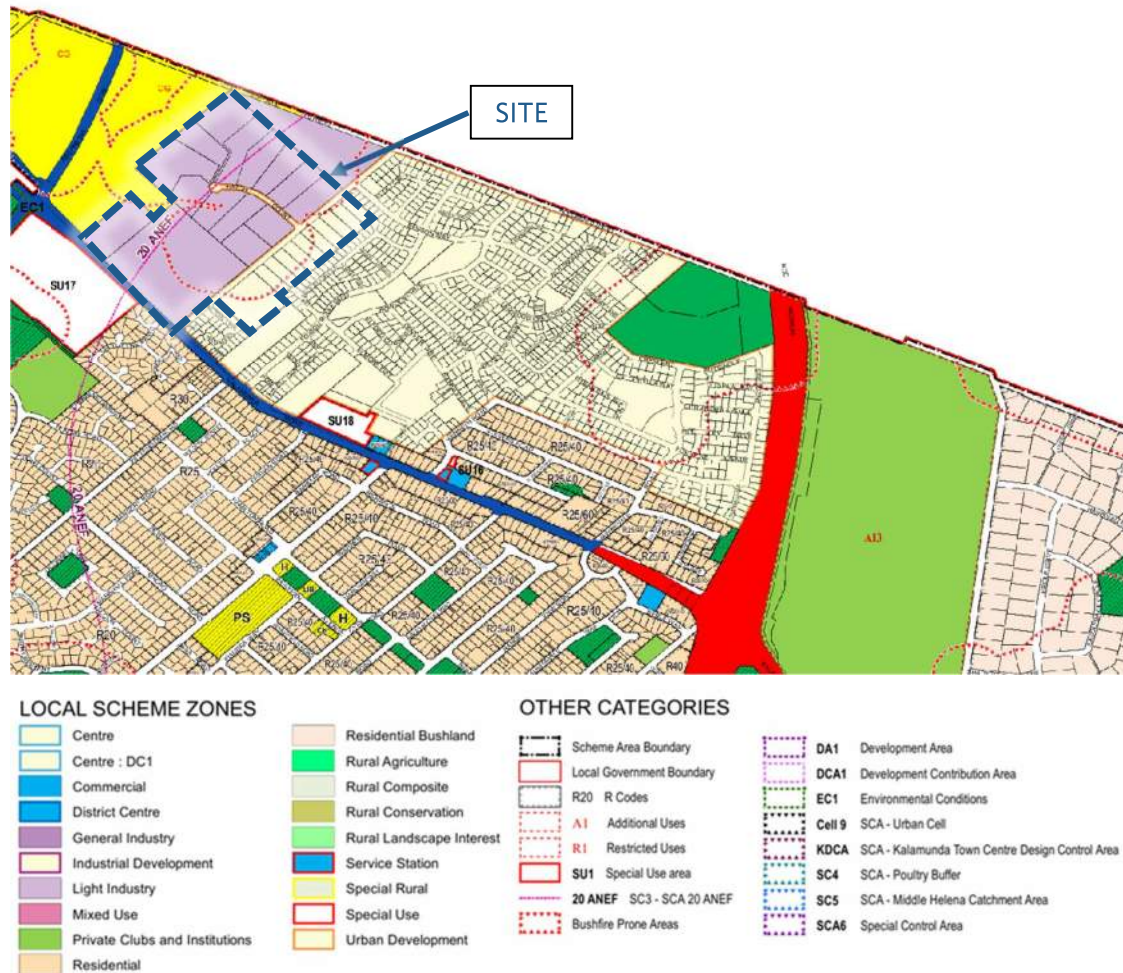
Similarly with Stirling Crescent, no additional crossover access to industrial sites is to be permitted under the LSP for future developments due to the desire to retain as much “residential amenity” for the Stirling Crescent road environment as practicable.

3 EXISTING SITUATION

3.1 Existing Land Uses within 800m of Structure Plan Area

Pursuant to the City of Kalamunda Local Planning Scheme No. 3 (LPS3), the Site is predominately zoned 'Light Industry' with a portion zoned 'Urban Development', as shown in Figure 5. The Site is surrounded by other light industry land uses to the north-east, urban development land uses to the east/south-east and residential land uses to the south.

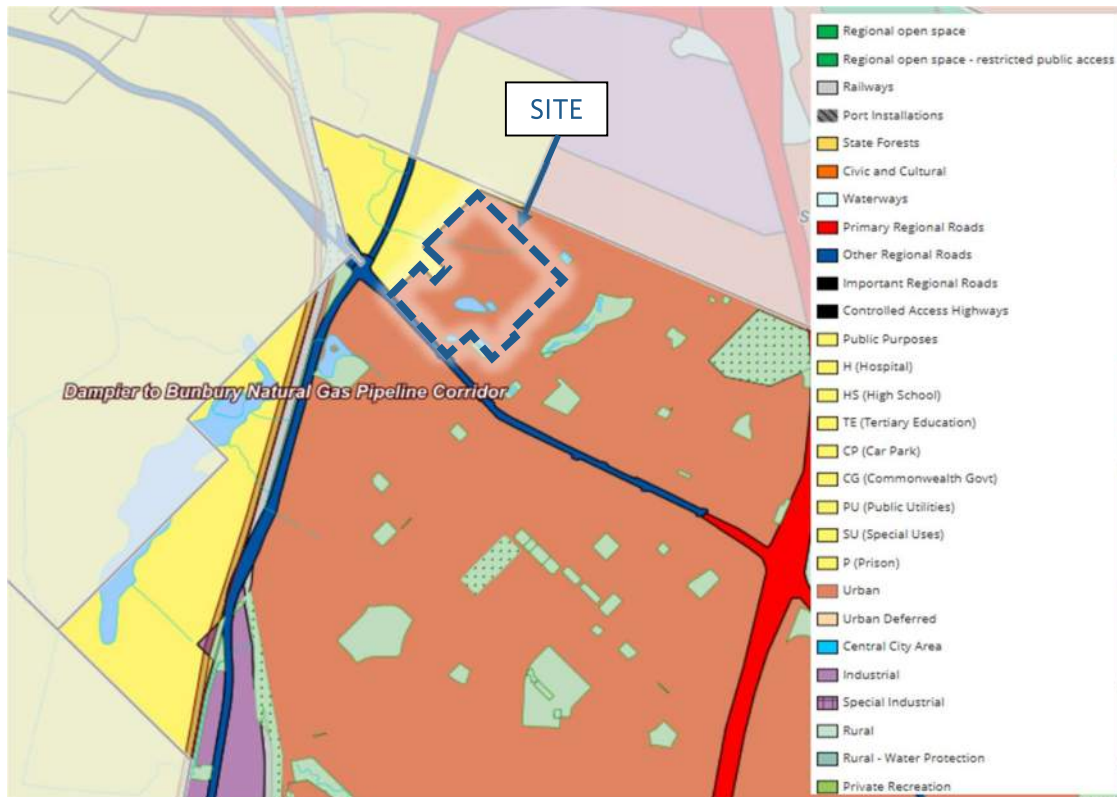
Figure 5 Existing Land Use Zoning



Source: City of Kalamunda Local Planning Scheme No. 3 (LPS3)

The LSP area is currently zoned 'Urban' under the *Metropolitan Region Scheme*, as shown in Figure 6. The Site is surrounded by other 'Urban' and 'Public Purpose' land uses.

Figure 6 Existing zoning for MRS



Source: City of Kalamunda Intramaps (2026)

3.2 Existing Road Network within 2 (or 5) km of Structure Plan

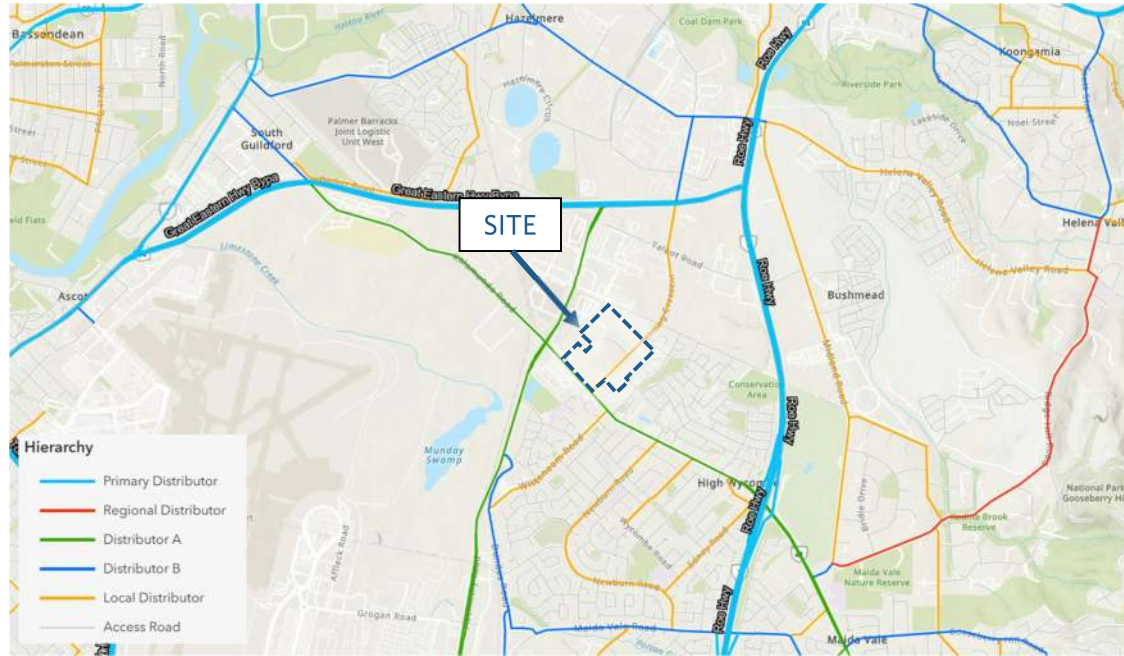
The road network within Western Australia is defined by Main Roads WA Road Hierarchy which describes the function, characteristic and management of each type of road. A description of each road type as per Main Roads WA Road Hierarchy criteria is summarised in **Table 2**.

Table 2 Road Hierarchy Description

Road Type	Description
Primary Distributors	Provide for major regional and inter-regional traffic movement and carry large volumes of generally fast-moving traffic. Some are strategic freight routes, and all are State Roads. They are managed by Main Roads Western Australia.
District Distributor A	Carry traffic between industrial, commercial and residential areas and generally connect to Primary Distributors. These are likely to be truck routes and provide only limited access to adjoining property. They are managed by local government.
District Distributor B	Perform a similar function to type A District Distributors but with reduced capacity due to flow restrictions from access to and roadside parking alongside adjoining property. These are often older roads with a traffic demand in excess of that originally intended. District Distributor A and B roads run between land-use cells and generally not through them, forming a grid which would ideally space them around 1.5 kilometres apart. They are managed by local government.
Regional Distributor	Roads that are not Primary Distributors, but which link significant destinations and are designed for efficient movement of people and goods within and beyond regional areas. They are managed by local government.
Local Distributor (Urban)	Roads that carry traffic within a cell and link District Distributors or Regional Distributors at the boundary, to access roads. The route of Local Distributors should discourage through traffic so that the cell formed by the grid of District Distributors only carries traffic belonging to or serving the area. These roads should accommodate buses but discourage trucks. Urban Local Distributor roads are managed by local government.
Local Distributor (Rural)	Connect to other Rural Distributors and to Rural Access Roads. Not Regional Distributors, but which are designed for efficient movement of people and goods within regional areas. Rural Local Distributor roads are managed by local government.
Access Roads	Provide access to abutting properties with amenity, safety and aesthetic aspects having priority over the vehicle movement function. These roads are bicycle and pedestrian friendly. They are managed by local government.

Figure 7 shows the road hierarchy network and Table 3 provides a summary of the road characteristics of the surrounding road network.

Figure 7 Existing Road Hierarchy



Source: MRWA Road Information Mapping System

Table 3 Existing Road Network

Road Name	Hierarchy	Jurisdiction	No. of Lanes	No. of Paths	Approximate Pavement Width (m)	Speed Limit (km/h)
Great Eastern Highway Bypass	Primary Distributor	MRWA	4 - 6	-	26	70 / 100
Roe Highway	Primary Distributor	MRWA	4 - 6	-	30	70 / 100
Kalamunda Road	Distributor A	LGA	2 - 4	1	7.5 - 18	60
Abernethy Road	Distributor A	LGA	2 - 4	-	10 - 26	60
Stirling Crescent	Local Distributor	LGA	2	1	7.5	60
Adelaide Street	Access Road	LGA	2	1	7.5	50
Hatch Court	Access Road	LGA	2	-	7	50
Peak Court	Access Road	LGA	2	-	10	50

Source: MRWA Road Information Mapping System

3.3 Existing Pedestrian/Cycle Networks within Existing Structure Plan Area

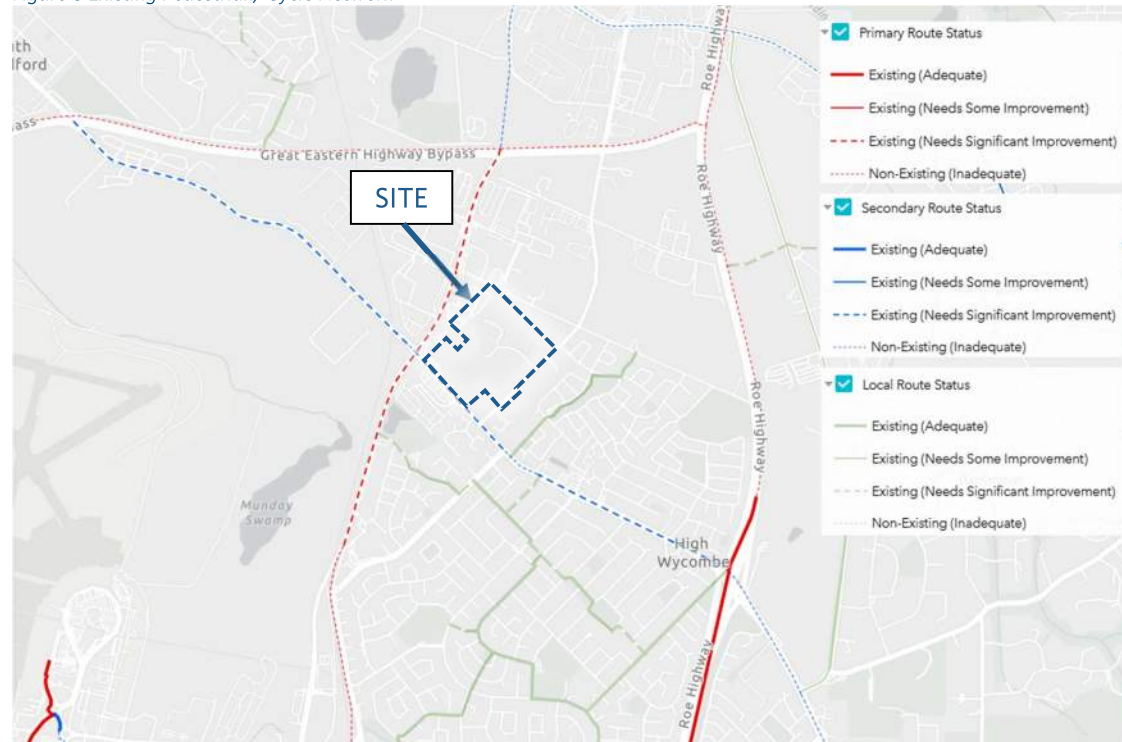
The LSP area has no other existing roads with any existing pedestrian/cycle networks.

3.4 Existing Pedestrian/Cycle Networks within 800m of Structure Plan Area

There is a 2.4m-wide footpath provided along one side of Adelaide Street, Stirling Crescent and Kalamunda Road. In addition, there is also a 1.8m-wide footpath along Wem Mews and Acton Link.

Sealed Shoulders are provided along both sides of Kalamunda Road which connect the Site to Roe Highway and Great Eastern Highway, and both sides of portions of Abernethy Road as shown in Figure 8. As per the LTCN, these routes require significant improvements.

Figure 8 Existing Pedestrian/Cycle Network



Source: Department of Transport Bicycle Network Maps

3.5 Existing Public Transport Services

The nearest bus stops to the Site are located on the southern boundary of the LSP along Kalamunda Road, as highlighted in yellow in Figure 9. These stops service Transperth Bus Route 278 which travel between High Wycombe and Midland Train Stations. Other Public transport facilities in the vicinity of the LSP are illustrated in Figure 10. The service frequencies are summarised in Table 4.

Figure 9 Existing Bus Stop Locations

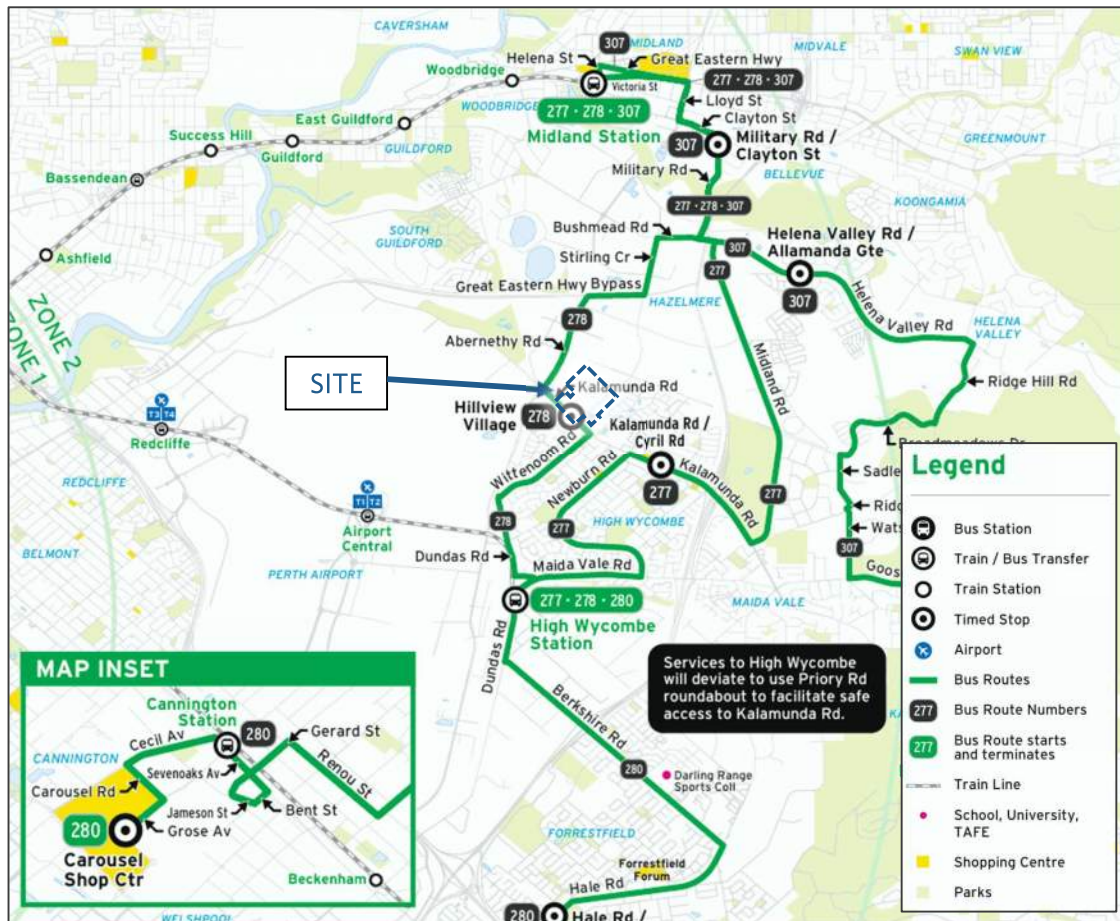


Source: Transperth

Table 4 - Bus Route Description and Frequency

Bus Route	Route Description	Weekday Frequency	Saturday Frequency	Sunday/Holiday Frequency
277	High Wycombe Station - Midland Station	24 - 30 mins	30 mins	30 mins
278	High Wycombe Station - Midland Station	24 - 30 mins	30 mins	30 mins
280	High Wycombe Station - Carousel Shop Ctr	20 - 30 mins	60 mins	60 mins
307	Kalamunda Bus Station - Midland Station	20 - 120 mins	No Service	No Service

Figure 10 Existing Public Transport Services



Source: Transperth

3.6 Existing Traffic Flows

The existing traffic volumes surrounding the LSP area were sourced from the Main Roads WA's Traffic Map database and are summarised in Table 5.

Table 5 Existing Traffic Volumes

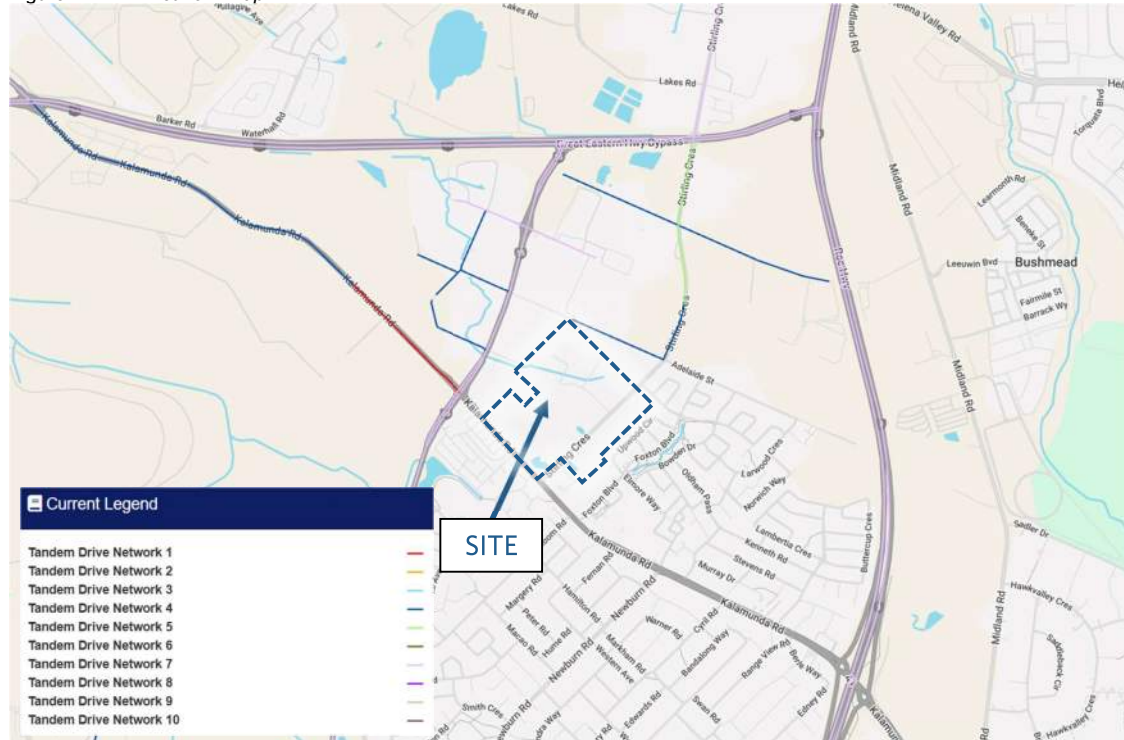
Road Name	Source	Date	AM Peak (vph)	PM Peak (vph)	Weekday (vpd)	HV%
Stirling Crescent South of Great Eastern Highway Bypass	MRWA	2023/24	529	570	6,050	13.3%
Kalamunda Road South of Abernethy Road	MRWA	2023/24	1,067	1,068	12,753	7.6%
Kalamunda Road North of Abernethy Road	MRWA	2023/24	939	1,164	12,382	12.3%
Abernethy Road North of Kalamunda Road	MRWA	2023/24	1,039	1,032	12,649	33.4%
Abernethy Road / Brinsmead Road Intersection	MRWA	2022	811	975	11,649	29.7%

3.7 Existing Restricted Access Vehicle (RAV) Network

The Site is currently not directly connected to the RAV network. The nearest RAV routes are along Stirling Crescent (north of Adelaide Street) (RAV 4/5), Abernethy Road (RAV 7), portions of Kalamunda Road (RAV 1/4) and a portion of Adelaide Street (RAV 4), as shown in **Figure 11**. There is currently a proposed future RAV 7 connection along Adelaide Street as part of the Great Eastern Highway Bypass Interchanges project as discussed in Section 5.1.1.

However, once Peak Court is added to the RAV network, the site could have RAV access onto Adelaide Street and Stirling Crescent (north).

Figure 11 RAV Network Map



Source: Main Roads HVS Network Map

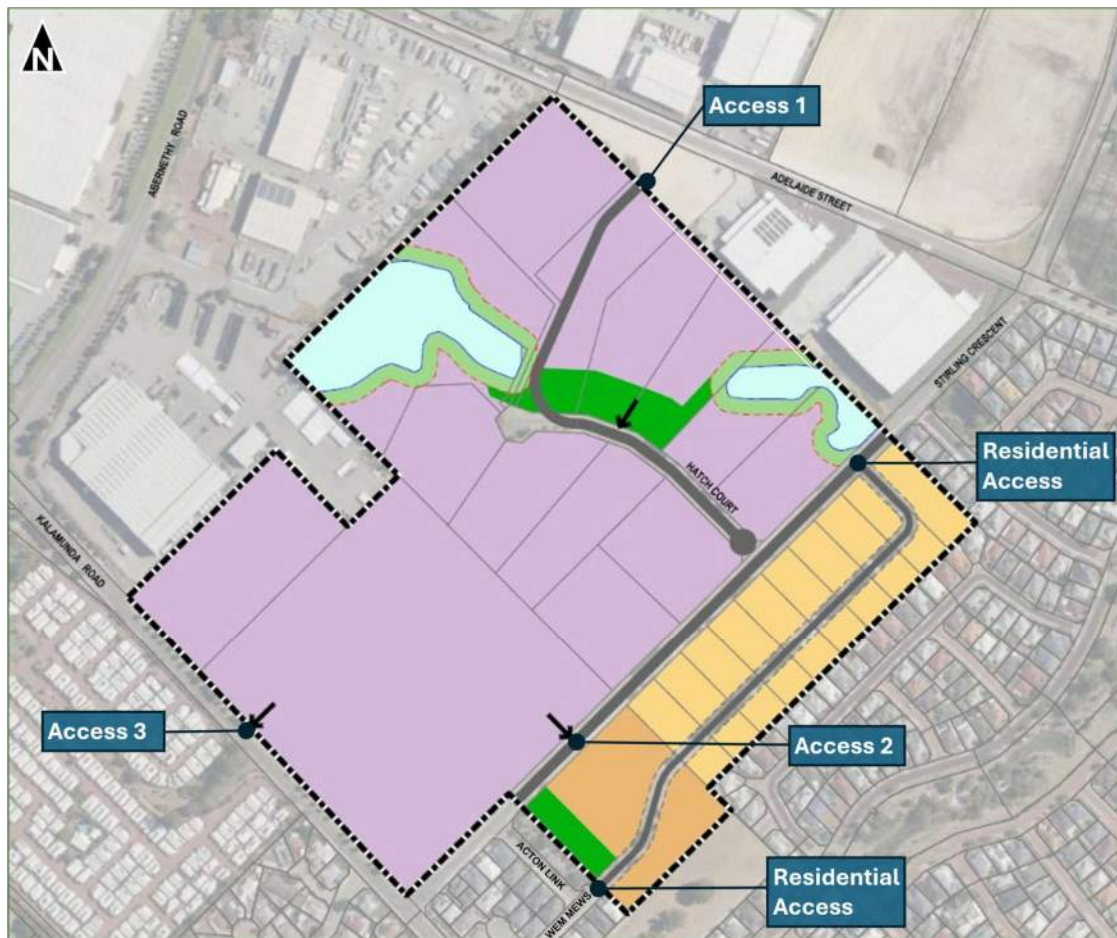
4 PROPOSED INTERNAL TRANSPORT NETWORKS

4.1 Changes/Additions to Existing Road Network of Proposed New Network

The proposed internal road hierarchy and indicative access points to the external network are shown in Figure 12 and described below:

- » Light Industrial Areas along Hatch Court will alternatively be accessed via Adelaide Street through Peak Court (existing stub road) through a proposed road with 20-m road reserve along Lot 13 as the existing connection of Hatch Court with Stirling Crescent will be converted to a cul-de-sac as shown. The road reserve of the currently constructed portion of Hatch Court will remain at 18m wide. The City of Kalamunda acquired Lot 13 for the purpose of the construction of Peak Court, a road link facilitating connection between Adelaide Street and Hatch Court.
- » Lots 200 and 201 will have access crossovers via Kalamunda Road and Stirling Crescent.
- » Residential lots will be accessed directly via Stirling Crescent and through a proposed road connecting Stirling Crescent to Wem Mews, with access back to Stirling Crescent via Acton Link.

Figure 12 Proposed Connections to External Road Network



Source: Dynamic Planning and Developments

As part of the LSP design development process, a high-level assessment was undertaken to evaluate several options for access arrangements as indicated in Table 6.

Table 6 Analysis of Access Arrangements

Option No.	Description	Pros	Cons
Option 1	Extension and construction of LSP Road through from Adelaide Street to Kalamunda Road with Hatch Court converted into a cul-de-sac	Improves overall traffic distribution, reduces pressure on Adelaide Street, supports development of Lot 200, and aligns with planning objectives to keep industrial traffic off Stirling Crescent.	Very costly (\$4.3-\$5.6 million), requires a major intersection upgrade at Kalamunda Road (signals or roundabout), may face strong community opposition, and could have issues with RAV4 route suitability on Kalamunda Road.
Option 2	Retention and modification of Hatch Court / Stirling Crescent intersection to allow access / egress onto Stirling with restricted industrial access	Distributes traffic more evenly and reduces pressure on Adelaide Street at a relatively low cost (about \$915,000).	Conflicts with planning scheme provisions by allowing industrial traffic on Stirling Crescent, may impact nearby residential amenity, does not improve access to Lot 200, and may conflict with existing development approvals.
Option 3 (adopted option for TIA)	Cul-de-sac at Hatch Court and Stirling Crescent with new LSP road connection to Adelaide Street only	Most cost-effective option and aligns with planning objectives and existing approvals while still achieving acceptable traffic performance.	It does not improve access to Lot 200 and results in more traffic being concentrated at the Adelaide Street intersection.
Option 4	Minor extension of option 3 LSP Road to Lot 200 and retention of cul-de-sac at Hatch Court	Relatively low additional cost (around \$600,000), provides some improved access for Lot 200, and may help reduce traffic on Kalamunda Road and Stirling Crescent.	Relies on existing access points, provides uneven benefits across the precinct, may face landowner objections, and complicates cost-sharing arrangements.
Option 5	Extension of option 3 LSP road through to lot 200 and a subsequent extension to Stirling Crescent	Improves traffic distribution and reduces pressure on Adelaide Street at a relatively low cost if funded by the developer	Conflicts with planning provisions by allowing industrial traffic on Stirling Crescent, has uncertain delivery timing, may face landowner objections, and creates uneven cost and benefit distribution across the precinct.

4.2 Road Reservation Widths and Cross Sections

The proposed road connecting Hatch Court to Peak Court (existing stub road intersecting with Adelaide Street) will have a 20m road reserve to allow RAV-4 access. However, the existing road reserve for the currently constructed portion of Hatch Court will remain at 18m wide. The proposed road within the residential lots will be consistent with the surrounding road network and will have a 16m road reserve with its connection to Mews Road adjacent to the Public Open Space (POS).

In accordance with the Liveable Neighbourhoods Guidelines, Access Streets are to accommodate shared pedestrian, bike, and vehicular movements and are capable of accommodating up to 3,000 vehicles per day (projected maximum volumes). For road reserves of up to 16m, which corresponds to Access Street C, the projected maximum volume is up to 3,000 vehicles per day. The Liveable Neighbourhood Guidelines is illustrated in Table 7.

Table 7 Function and characteristics of local streets

Street type and function	Street characteristics	Street name	Max design speed/ target operating speed (km/hr)	Indicative volume range* (vehicles per day)	Indicative street reserve width (metres)+	Indicative road pavement width (metres)
Access streets Access streets are to accommodate shared pedestrian, bike and vehicular movements. The requirements of adjacent land uses should be supported through street design.	Varied formats to suit a range of typical conditions in predominantly residential areas at different densities, and with different traffic volumes. An avenue access street (Access street A) with median is particularly suited to incorporation of a drainage swale. Access street B is a wider undivided street for situations with increased parking and/or traffic demand. The most typical and most common residential street will be Access street C – Yield street. Access street D is for short, low volume and low parking demand streets. In addition, a comprehensively designed variant with 3.5 m travel lane with indented parking, is also specified for very low volume short streets.	Access street A – avenue	50/40	3000	20-24	2 x 3.5 (or 2 x 3.6 under some conditions) plus indented parking.
		Access street B – wider street	50/40	3000	16.5-18	9.7
		Access street C – yield or give way street	50/40	3000	15.4-16	7.2 (7-7.5)
		Access street D – narrow yield or give way street	50/30	1000	14.2	5.5-6
			50/20	150	14.2	3.5 (plus parking indents)

Source: WAPC Liveable Neighbourhoods Guideline 2009

The indicative cross sections for the proposed roads within the structure plan are as shown from Figure 13 to Figure 15.

Figure 13 Indicative Cross Section – Proposed Road for Hatch Court (with existing 18m road reserve width)



Source: Streetsketch

Figure 14 Indicative Cross Section – Proposed Road adjacent to Public Open Space and Residential (16m Reserve)



Source: Streetsketch

Figure 15 Indicative Cross Section – Proposed Internal Road for Hatch Court (20m Reserve)



Source: Streetsketch

4.3 Intersection Controls

As discussed in Section 4.1, the light industrial areas within the LSP, currently accessible through Hatch Court from Stirling Crescent, will instead be accessible via a proposed road extension running from Hatch Court's western end to the Peak Court stub road with the closure of the existing Hatch Court/Stirling Crescent intersection into a cul-de-sac. The new northern connection will be via the Peak Court stub, which has been constructed as a priority-controlled intersection with its junction at Adelaide Street. It is noted that the stop or give way control signs and lines are yet to be installed at the intersection.

The Access Crossovers for Lots 200 and 201 connecting to both Kalamunda Road and Stirling Crescent are to be located as per the existing crossover locations, and the final layout / design of the crossovers will be subject to the future developments requirements as determined through a detailed development application process.

Access to the residential lots will be done via a proposed access street, with a priority-controlled intersection off Stirling Crescent, and which will be connected to the existing Wem Mews, thereby providing residents another access point to Stirling Crescent to the south (through Acton Link). The intersections will be priority controlled with either a stop sign or give way sign (subject to detailed design and Main Roads approval) consistent with the requirements of Liveable Neighbourhoods.

4.4 Speed Limits

The indicative speed limits for roads within the LSP as shown in the previous section are as follows:

- » Hatch Court – 50 km/h
- » Peak Court – 50 km/h

» Proposed Access Road to Residential Area - 50 km/h

4.5 Pedestrian/Cycle Networks and Crossing Facilities

There are no proposed internal pedestrian/cycle networks within the Light Industrial section of the LSP area since access is mainly by personal vehicles and delivery vehicles.

As for the residential section of the LSP area, it is assumed that a 1.8m-wide footpath will be available east of the proposed roadway as shown in

Figure 14 and Figure 15, consistent with the existing footpath available along Wem Mews and the surrounding road network.

4.6 Public Transport Routes

There are no proposed internal public transport routes existing or planned within the LSP area.

5 CHANGES TO EXTERNAL TRANSPORT NETWORKS

5.1 Road Network

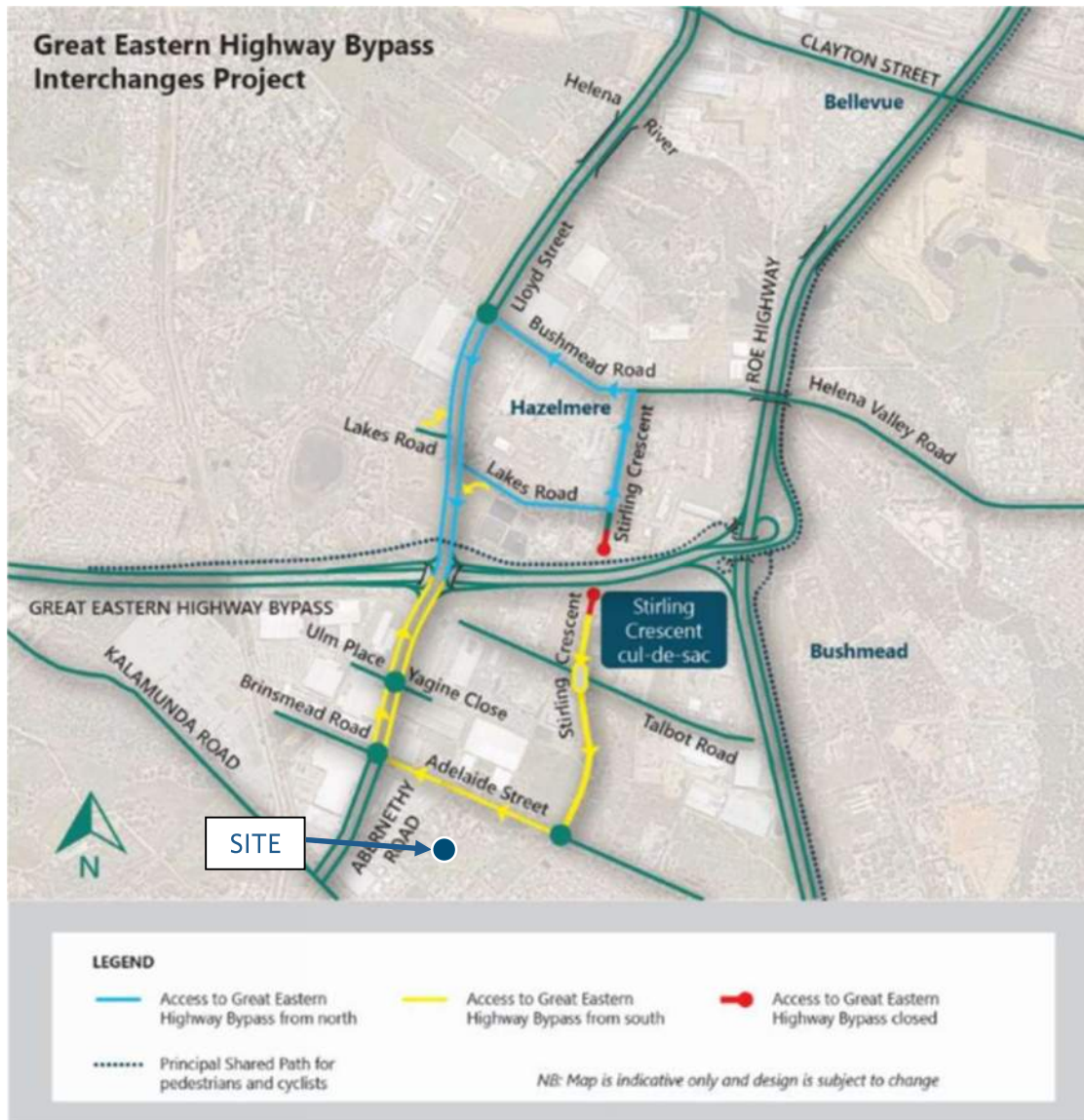
5.1.1 Great Eastern Highway Bypass Interchanges Project

Main Roads WA is undertaking the Great Eastern Highway Bypass Interchanges Project which will have the following components:

- » Lloyd Street will be extended via a bridge over Helena River which will improve access to Midland.
- » Abernethy Road will be elevated to pass over Great Eastern Highway Bypass via a grade separated interchange to alleviate congestion at the signalised intersections of Great Eastern Highway Bypass and Abernethy Road, and Great Eastern Highway Bypass and Stirling Crescent.
- » Parts of Abernethy Road will be duplicated and a RAV 7 compliant intersection with Adelaide Street will be provided.
- » A grade-separated interchange will be built at the crossing of Great Eastern Highway Bypass and Roe Highway to provide free flowing access between the two roads, which is expected to benefit 60,000 road users per day.
- » A new Principal Shared Path (PSP) for pedestrians and cyclists will extend from Roe Highway and Great Eastern Highway Bypass Interchange and connect to the PSP at the Roe Highway and Kalamunda Road Interchange.
- » Corresponding road improvements will be done at Stirling Crescent and Adelaide Street to complement the proposed interchange.
- » Adelaide Street / Stirling Crescent intersection will operate as a roundabout facilitating all vehicle movements.
- » A new roundabout will be built at the intersection of Abernethy Road and Adelaide Street/Brinsmead Road, and Adelaide Street will be extended from its current end point to the new roundabout. Upgrades to the section of Abernethy Road between Kalamunda Road and Dundas Road are currently being finalised with details to be confirmed by MRWA.

According to the Main Roads WA website, pre-construction works have been completed along with upgrades to Adelaide Street. However, major construction works are currently placed on hold to secure approvals needed to commence construction.

Figure 16 Great Eastern Highway Bypass Interchanges Project



Source: MRWA Great Eastern Highway Bypass Interchanges Project – Local Road Design Update – Stirling Crescent, Talbot Road, and Adelaide Street (August 2021)

5.2 Pedestrian/Cycle Networks and Crossing Facilities

As part of the Great Eastern Highway Bypass Interchanges Project, MRWA proposes to construct a new PSP along Great Eastern Highway Bypass and Roe Highway.

Figure 17 shows the Department of Transport’s aspirational future cycling network within the Perth and Peel. The map shows the proposed cycle route hierarchy for the roads surrounding the proposed LSP which is summarised below.

- » Great Eastern Highway Bypass – Primary Route
- » Roe Highway – Primary Route
- » Abernethy Road – Primary Route
- » Kalamunda Road – Primary Route

Figure 17 LTCN Network

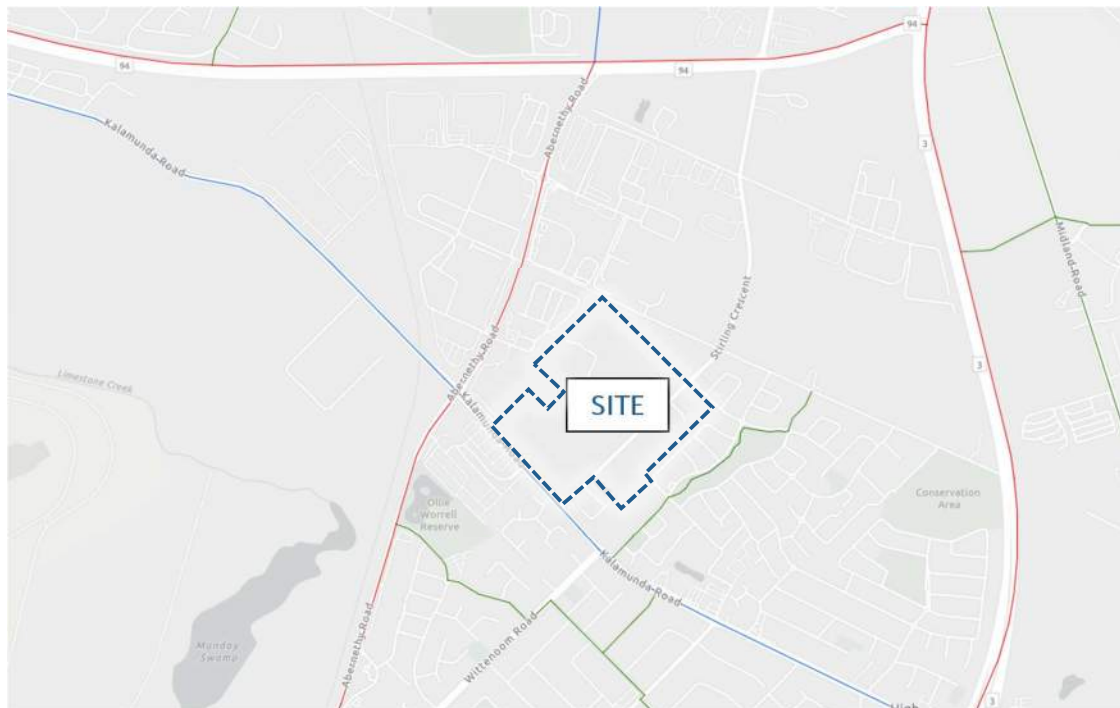


Figure 18 shows the ultimate network plan for the City of Kalamunda Bicycle Plan 2017. No new paths are proposed in the vicinity of the LSP which was to remain rural at the time the Bicycle Plan was prepared. The City of Kalamunda is expected to update the Bicycle Plan later this year.

Figure 18 City of Kalamunda Bicycle Plan 2017 – Proposed Ultimate Cycling Network



Source: City of Kalamunda

5.3 Public Transport Services

PTG has contacted the Public Transport Authority (PTA) and was advised that no significant changes are planned for the existing bus routes surrounding the LSP in the foreseeable future.

6 INTEGRATION WITH SURROUNDING AREA

6.1 Trip Attractors/Generators Within 800 Metres

Significant local attractors/generators within 800m include:

- » Industrial estates along Abernethy Road, north and west of the LSP
- » Matthew Gibney Catholic Primary School, South of Kalamunda Road
- » Residential areas, east of Stirling Crescent and south of Kalamunda Road

6.2 Proposed Changes to Land Uses Within 800 Metres

Within the proximity of the LSP area, the High Wycombe Cell U2 Outline Development Plan has been identified as a proposed change to the land use within the surrounding area. While the proposed changes have mostly been identified to be adjacent to the High Wycombe Shopping Centre Area, most of the proposed changes pertaining to the residential developments east of the LSP area has already been constructed as of latest aerial imagery as shown in Figure 2.

Figure 19 High Wycombe Cell U2 Outline Development Plan



Source: City of Kalamunda

6.3 Travel Desire Lines from Structure Plan to these Attractors / Generators

The main access point to the LSP is anticipated to be via Adelaide Street / Peak Court stub for the industrial lots currently with direct access from Hatch Court, while Lot 200 and Lot 201 will have crossovers via Kalamunda Road and Stirling Crescent (as per existing). There will also be a new intersection connection via Stirling Crescent for the Residential portion of the LSP area.

Trips to and from the proposed LSP are expected to pass through Adelaide Street, Stirling Crescent, and Kalamunda Road to access the wider road network.

Trips from the industrial lots along Hatch Court will utilise Peak Court to exit onto Adelaide Street and pass through Abernethy Road.

Vehicles from Lots 200 and 201 will pass through Kalamunda Road and Stirling Crescent and travel along Abernethy Road or Roe Highway to access the wider road network.

Trips from the residential area are expected to exit via Stirling Crescent and travel along Kalamunda Road to reach shopping centres and schools primarily to the south and southeast of the Site.

6.4 Adequacy and Deficiencies of the External Transport Networks

Subject to the proposed changes to the External Transport Network outlined in Section 5, the adequacy of the external road network and pedestrian/cycle network will be assessed in **Section 7**.

The existing public transport routes are considered adequate to service the LSP area since there are several bus stops and routes within the vicinity of the Site and its accesses.

7 ANALYSIS OF TRANSPORT NETWORKS

7.1 Structure Plan Traffic Generation

The trip generation rates for the land uses within the LSP were based on the rates recommended in the WAPC Transport Impact Assessment Guidelines Volume 2 – Planning Schemes, Structure Plans and Activity Centre Plans, whilst the daily rates and trip directionality percentages have been taken from Transport for New South Wales – Guide to Transport Impact Assessment. Similar to industrial developments surrounding the Site, it is assumed that 30% of the total lot areas will be allocated to associated structures for ‘light industry’ upon full development of the local structure plan.

Table 8 shows the trip generation rates for the proposed land uses, **Table 9** shows the directional distribution and **Table 10** shows the total traffic generated by the proposed LSP.

Table 8 Trip Generation Rates

Land Use	Source	Yield	AM Peak Rate	PM Peak Rate	Daily Rate
Light Industry	WAPC / TfNSW	64,710 m ²	1 trip per 100 m ²	1 trip per 100 m ²	4 trips per 100 m ²
Residential (Low Density)	WAPC	140 dwellings	0.8 trips per dwelling	0.8 trips per dwelling	8.0 trips per dwelling

Table 9 Trip Directionality

Land Use	AM Peak		PM Peak		Daily	
	In	Out	In	Out	In	Out
Light Industrial	80%	20%	20%	80%	50%	50%
Residential (Low Density)	25%	75%	63%	38%	50%	50%

Table 10 Estimated Trip Generation

Land Use	AM Peak Trips		PM Peak Trips		Daily Trips	
	IN	OUT	IN	OUT	IN	OUT
Light Industrial	518	130	130	518	1,295	1,295
Residential (Low Density)	28	84	70	42	560	560
	546	214	200	560	1,855	1,855
	760		760		3,710	

The proposed local structure plan is estimated to generate 760 vehicle trips in each of the AM and PM peak hour periods with an estimated 3,710 vehicle trips daily.

The light Industrial areas are estimated to dominate the share of total trips generated at 648 vehicle trips each in the AM and PM peak hour periods with 2,590 daily vehicle trips (71% of the total daily trips). The residential component of the LSP is estimated to generate 112 vehicle trips each in the AM and PM peak hour periods with at least 1,120 daily vehicle trips (30% of the total daily trips).

7.2 Traffic Distribution

Figure 20 and Figure 21 show the inbound and outbound distribution of the proposed LSP's estimated trip generation for the assumed year of full development. The trip distribution is based the location of the surrounding trip generators and assumes the completion of all works under the Great Eastern Highway Bypass Interchanges Project wherein the Abernethy Road and Adelaide Street will open and operate as a roundabout, and the Stirling Crescent intersection will close at Great Eastern Highway Bypass Road and will be converted into a cul-de-sac. This is expected to cause some traffic currently using Stirling Crescent to be diverted onto Abernethy Road.

Kalamunda Road provides direct connections to Roe Highway and Great Eastern Highway. Considering that the shortest distance to get into and out of the Site is through Access 3, it's reasonable to assume that majority of trips generated by L200 & 201 will utilise this access point. In addition, there is a desire by the City of Kalamunda to reduce industry related traffic on Stirling Crescent, and it is therefore likely, that future development of lot 200 and lot 201 will be encouraged to ensure as much traffic as practicable is kept away from the Stirling Crescent crossover access.

Figure 20 Trip Distribution – Inbound

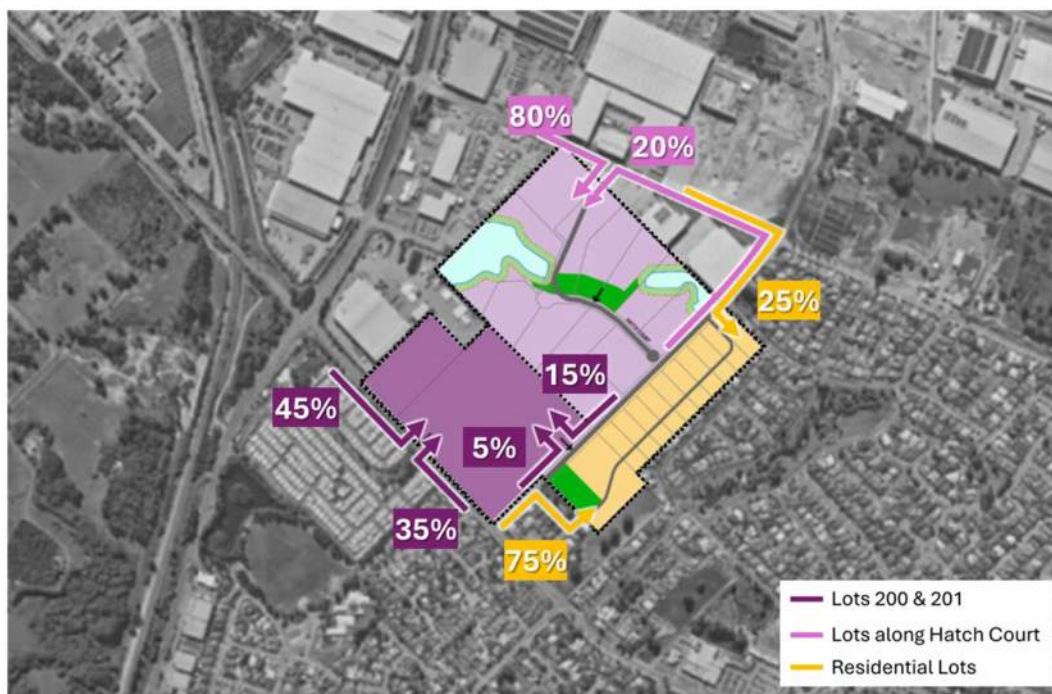
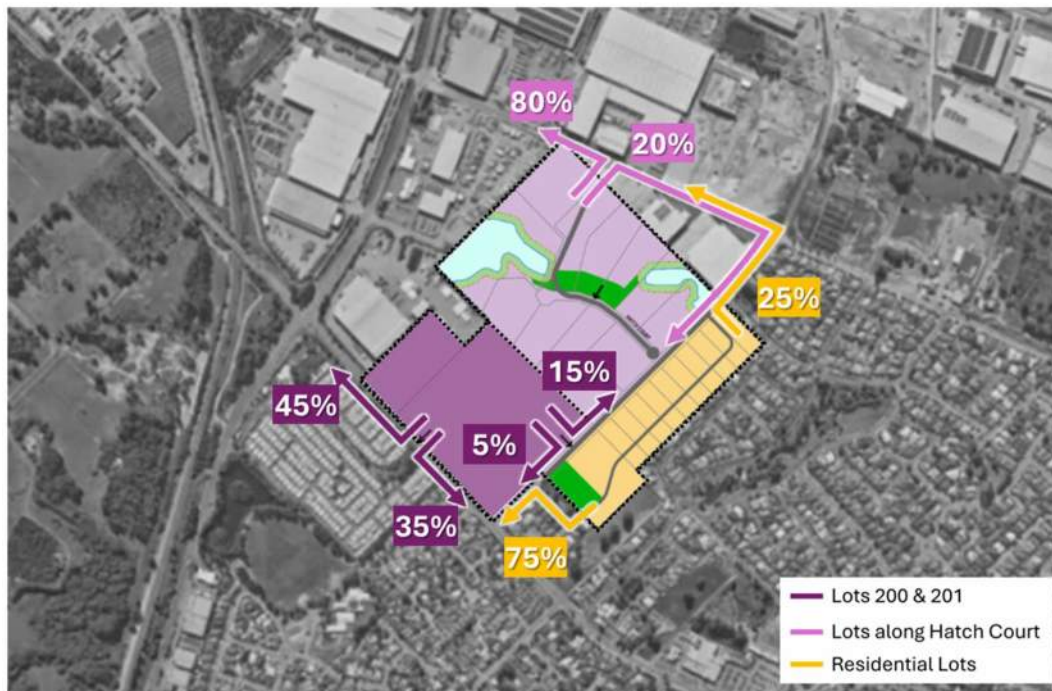


Figure 21 Trip Distribution - Outbound



7.3 Extraneous (Through) Traffic

Background traffic flows are indicated in Figure 23. High-resolution version of the figure is provided in Appendix C.

7.4 Key Intersections Analysis

7.4.1 Analysis Scenarios

A SIDRA analysis has been undertaken for the following key intersections shown in Figure 22:

1. Abernethy Road / Adelaide Street
2. Adelaide Street / Site Access 1 (Peak Court stub road)
3. Adelaide Street / Stirling Crescent
4. Stirling Crescent / Site Access 2
5. Stirling Crescent / Kalamunda Road
6. Kalamunda Road / Site Access 3
7. Kalamunda Road / Abernethy Road

Based on a 15-year horizon, the following scenarios have been adopted:

- » Scenario 1 – 2041 Background Traffic
- » Scenario 2 – 2041 With Development

Figure 22 Key Intersections



Source: Dynamic Planning and Developments

7.4.2 Assessment Parameters

Key assessment parameters and assumptions adopted for the SIDRA analysis are detailed below:

- » Vehicles accessing Lots 200 and 201 will primarily utilise the crossover via Kalamunda Road since this road provides direct access to Roe Highway and Great Eastern Highway.
- » Vehicles coming from northern generators will access Lot 200 via Stirling Crescent.
- » The remaining industrial lots along Hatch Court will be accessed via Adelaide Street through Peak Court.
- » At least 10% of the peak hour trips generated by the LSP's industrial lots are assumed to be heavy vehicle traffic. This number was adopted based on the historic peak hour heavy vehicle numbers along Stirling Crescent (north) and Kalamunda Road.
- » Majority of trips for the residential area will be to places of work, shopping centres, schools, and other generators south of the Site.
- » 25% of residential trips were assumed to be generated by the Midland town centre to the north of the Site.
- » Closure of Great Eastern Highway Bypass / Stirling Crescent Intersection results to re-diversion of traffic from Stirling Crescent to Abernethy Road.
- » Adelaide Street / Abernethy Road / Brinsmead Road and Adelaide Street / Stirling Crescent intersection will operate as a roundabout.

7.4.3 Intersection Performance

The intersections have been analysed using the SIDRA analysis program. This program calculates the performance of intersections based on input parameters, including geometry and traffic volumes. As an output, SIDRA provides values for the Degree of Saturation (DOS), queue lengths, delays, level of service, and 95th Percentile Queue. These parameters are defined as follows:

- » **Degree of Saturation (DOS):** is the ratio of the arrival traffic flow to the capacity of the approach during the same period. The Degree of Saturation ranges from close to zero for varied traffic flow, up to one for saturated flow or capacity.
- » **95% Percentile Queue Length:** is the statistical estimate of the queue length up to or below which 95% of all observed queues would be expected;
- » **Average Delay:** is the average of all travel time delays for vehicles through the intersection. An unsignalised intersection can be considered to be operated at capacity where the average delay exceeds 40 seconds for any movement;
- » **Level of Service (LOS):** is the qualitative measure describing operational conditions within a traffic stream and the perception by motorists and/or passengers. Table 11 provides a description of the different levels of service with the Level of Service Target being LOS D. Exceeding this threshold indicates that the road section is exceeding its practical capacity. Above these values, users of the intersection are likely to experience unsatisfactory queueing and delays during the peak hour periods.

The acceptable value for average delay is according to the thresholds set by the Western Australian Planning Commission (WAPC) as summarised in Table 12 while the practical levels of Degree of Saturation (DOS) are according to the Austroads Guide to Traffic Management criteria as summarised in Table 13. In addition, the *Signal performance Requirements* as set out by Main Roads WA is summarised in Table 14.

Table 11 Level of Service (LoS) Performance Criteria

LOS	Description	Signalised Intersection	Unsignalised Intersection	Roundabout
A	No or minimal delays (best condition). Queues are rarely more than one vehicle	≤10 sec	≤10 sec	≤10 sec
B	Short traffic delays. Occasionally more than one queued vehicle.	10-20 sec	10-15 sec	10-20 sec
C	Average traffic delays. Often more than one queued.	20-35 sec	15-25 sec	20-35 sec
D	Longer traffic delays. Regularly more than one queued vehicle.	35-55 sec	25-35 sec	35-50 sec
E	Very long traffic delays. Traffic demand is near or equal to the practical capacity of the intersection. Almost always more than one queued vehicle.	55-80 sec	35-50 sec	50-70 sec
F	Forced flow conditions with extensive delays caused by geometric and/or operational constraints external to the intersection.	≥80 sec	≥50 sec	≥70 sec

Table 12 WAPC Thresholds for Average Delay

Criteria	Average Delay (sec/veh)
Signalised intersections	
> Average delay for all vehicles passing through the intersection	<55 secs
> Average delay for any individual vehicle, pedestrian or cyclist movement	<65 secs
Priority intersections (roundabouts, give way and stop)	
> Average delay for all vehicles on the non-priority arms (that is, have to give way or stop)	<35 secs
> Average delay for any individual vehicle, pedestrian or cyclist movement	<45 secs
Right turn lanes	
> Exclusive turning movement queue length	Less than available storage (95 th percentile queue)

Source: WAPC Transport Impact Assessment Guidelines Volumes 4 – Individual Developments

Table 13 Austroads Criteria for Degree of Saturation (DOS)

Criteria	Degree of Saturation
Signalised intersections	0.90
Roundabouts	0.85
Sign-controlled intersection	0.80

Source: Austroads Guide to Traffic Management Part 3: Transport Study and Analysis Methods, Section 4.2.4

Table 14 MRWA Signal Performance Requirements

Criteria	Degree of Saturation	Level of Service
1. Opening Year	80% DOS	Intersection LOS D or better
2. STH (i.e., five years)	85% DOS	Intersection LOS D or better
3. MTH (i.e., 10 years)	<100% DOS	Intersection LOS E or better

Source: MRWA Traffic Signals Approval Policy

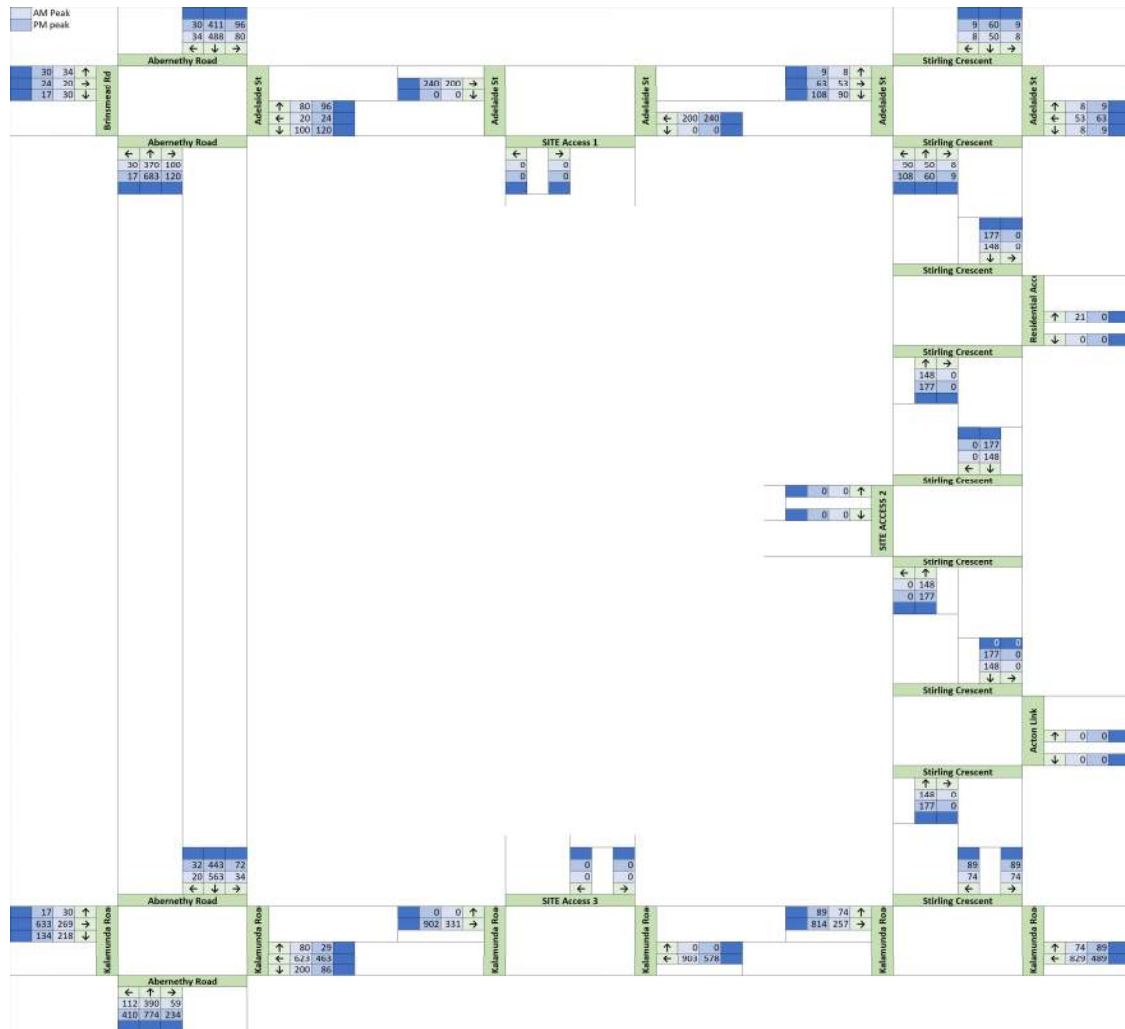
7.4.4 Background Traffic

The following assumptions were made when calculating the background traffic based on traffic volumes from MRWA Traffic Map:

- » The LSP will be fully developed in 15 years' time.
- » An annual growth rate of 1% will be used for the 15-year horizon scenarios.
- » AM peak hour being 10% of ADT
- » PM peak hour is 12% of ADT
- » The Great Eastern Highway Bypass Interchanges Project will be completed by 2041.
- » Stirling Crescent will be closed at the Great Eastern Highway Bypass Road and will be converted into a cul-de-sac. Existing traffic volumes indicate that 6,050 vehicles pass through Stirling Crescent daily, most of which are expected to be diverted towards Abernethy Road once it is closed. The following assumptions were considered for the Stirling Crescent traffic that will be diverted to Abernethy Road:
 - Daily: 1000 vehicles per day (with 13.3% HV) – it is assumed that only this portion of the daily Stirling Crescent traffic will utilise Abernethy Road. The remaining diverted traffic will likely utilise Roe Highway instead.
 - AM Peak: 100 vehicles per hour
 - PM Peak: 120 vehicles per hour
- » 2022 traffic data from MRWA was used for the intersection of Abernethy Road and Kalamunda Road. A 1% growth rate was used to obtain background traffic counts for 2041. Heavy vehicles constitute 33.4% and 7.6% of the total vehicle counts along Abernethy Road and Kalamunda Road, respectively
- » Adelaide Street will have a connection at Abernethy Road by 2041 and will operate as a roundabout, which is expected to increase traffic activity along Adelaide Street. There is currently a proposed RAV 7 connection along Adelaide Street as part of the GEHBI, which will cater to heavy vehicles accessing the Site and surrounding industrial lots. The HV% from traffic data along Abernethy Road was adopted for Adelaide Street.
 - Daily: 3000 vehicles per day (33.4% HV)
 - AM Peak: 300 vehicles per hour
 - PM Peak: 360 vehicles per hour

Traffic data for Scenario 1 (2041) are shown in **Figure 23**. High-resolution version of the figure is provided in **Appendix C**.

Figure 23 Background Traffic Data - Scenario 1 - 2041 Background Traffic



7.4.6 Abernethy Road / Adelaide Street / Brinsmead Road

The SIDRA layout adopted for Abernethy Road / Adelaide Street / Brinsmead Road intersection is shown in **Figure 25**.

The analysis results for the intersection are presented in **Table 15** and **Table 16**, which indicate that the roundabout will operate satisfactorily in both scenarios, with a maximum LOS B, delay of 19.1 seconds, and degree of saturation 0.753. The degree of saturation is below the 0.85 DOS threshold set by Austroads for roundabouts.

Figure 25 SIDRA Layout – Abernethy Road / Adelaide Street / Brinsmead Road

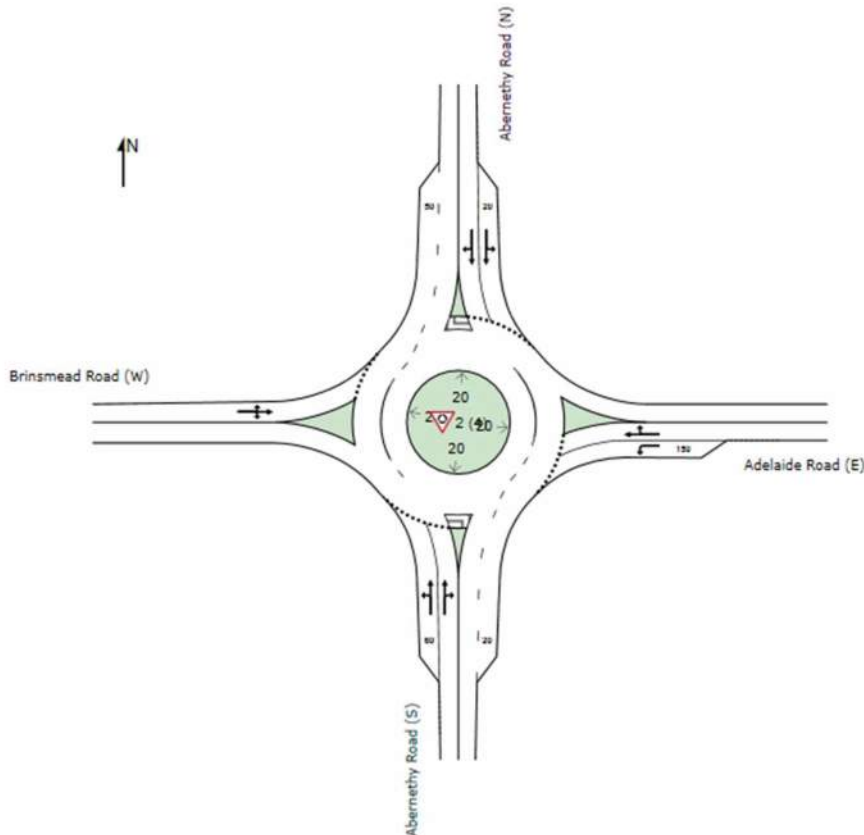


Table 15 SIDRA Results – Abernethy Road / Adelaide Street / Brinsmead Road – Scenario 1

Intersection Approach	Turn	AM Peak				PM Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Abernethy Road (S)	L	0.139	6	A	6.7	0.231	6.3	A	12
	T	0.348	5.6	A	21.3	0.576	6.4	A	46.1
	R	0.348	10.1	B	21.3	0.576	10.7	B	46.1
Adelaide Road (E)	L	0.156	9.2	A	7.4	0.174	8.5	A	8.6
	T	0.175	9.1	A	8.1	0.192	8.5	A	9.3
	R	0.175	13.9	B	8.1	0.192	13.4	B	9.3
	L	0.125	6.2	A	5.6	0.137	6.3	A	6.4

Abernethy Road (N)	T	0.453	5.8	A	29.5	0.4	5.8	A	25.2
	R	0.453	10.4	B	29.5	0.4	10.4	B	25.2
Brinsmead Road (W)	L	0.151	8.6	A	5.9	0.178	12.4	B	7.4
	T	0.151	8.4	A	5.9	0.178	11.2	B	7.4
	R	0.151	13.3	B	5.9	0.178	16.1	B	7.4

Table 16 SIDRA Results Abernethy Road / Adelaide Street / Brinsmead Road – Scenario 2

Intersection Approach	Turn	AM Peak				PM Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Abernethy Road (S)	L	0.045	6.5	A	2	0.302	8.8	A	15.7
	T	0.566	6.4	A	43.9	0.753	11.6	B	92.7
	R	0.566	11.1	B	43.9	0.753	16.3	B	92.7
Adelaide Street (E)	L	0.263	10.9	B	13.8	0.414	10.3	B	23.8
	T	0.275	9.3	A	15.3	0.424	9	A	25.4
	R	0.275	14.5	B	15.3	0.424	13.9	B	25.4
Abernethy Road (N)	L	0.329	7.9	A	17.6	0.207	6.8	A	10.5
	T	0.555	7.8	A	42.3	0.426	6.2	A	28.5
	R	0.555	12.5	B	42.3	0.426	10.8	B	28.5
Adelaide Street (W)	L	0.259	12.5	B	13.3	0.257	16.2	B	11.8
	T	0.259	12.6	B	13.3	0.257	14.1	B	11.8
	R	0.259	17.5	B	13.3	0.257	19.1	B	11.8

7.4.7 Adelaide Street / Site Access 1 – Peak Court

The SIDRA layout adopted for Adelaide Street / Site Access 1 – Peak Court intersection is shown in **Figure 26**. The analysis results for the intersection are presented in **Table 17** and **Table 18**, which show that the access will be able to operate adequately for both scenarios.

Figure 26 SIDRA Layout - Adelaide Street / Site Access 1 at Peak Court

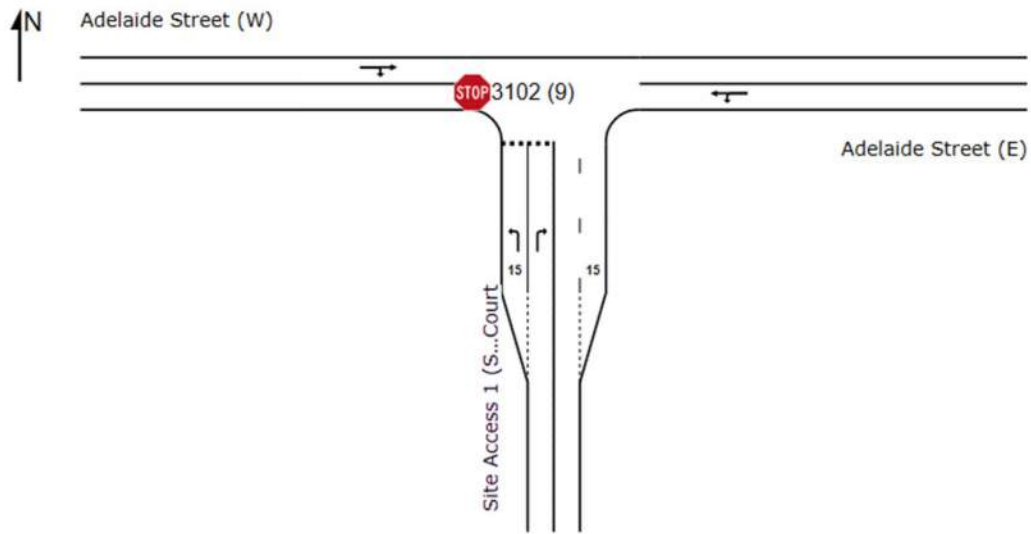


Table 17 SIDRA Results - Adelaide Street / Site Access 1 - Scenario 1

Intersection Approach	Turn	AM Peak				PM Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Site Access 1 - Peak Court (S)	L	0.001	6.5	A	0	0.001	6.7	A	0
	R	0.001	7.8	A	0	0.002	8.5	A	0
Adelaide Street (E)	L	0.143	4.7	A	0	0.172	4.7	A	0
	T	0.143	0	A	0	0.172	0	A	0
Adelaide Street (W)	T	0.143	0	A	0.1	0.172	0	A	0.1
	R	0.143	4.8	A	0.1	0.172	4.8	A	0.1

Table 18 SIDRA Results - Adelaide Street / Site Access 1 - Scenario 2

Intersection Approach	Turn	AM Peak				PM Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Site Access 1 - Peak Court (S)	L	0.057	6.7	A	1.8	0.244	7.3	A	8.7
	R	0.04	12	B	0.9	0.125	10.4	B	3.2
Adelaide Street (E)	L	0.203	5.3	A	0	0.209	4.8	A	0
	T	0.203	0.1	A	0	0.209	0.1	A	0
Adelaide Street (W)	T	0.384	1.6	A	20.5	0.241	0.5	A	5.7
	R	0.384	6.8	A	20.5	0.241	6.4	A	5.7

7.4.8 Adelaide Street / Stirling Crescent

The SIDRA layout adopted for Adelaide Street / Stirling Crescent is shown in Figure 27, which will operate as a roundabout.

The analysis results for the intersection are presented in Table 19 and Table 20. The results indicate that the intersection will operate satisfactorily in both scenarios with a maximum LOS B and will maintain a DOS <0.85.

Figure 27 SIDRA Layout - Adelaide Street / Stirling Crescent

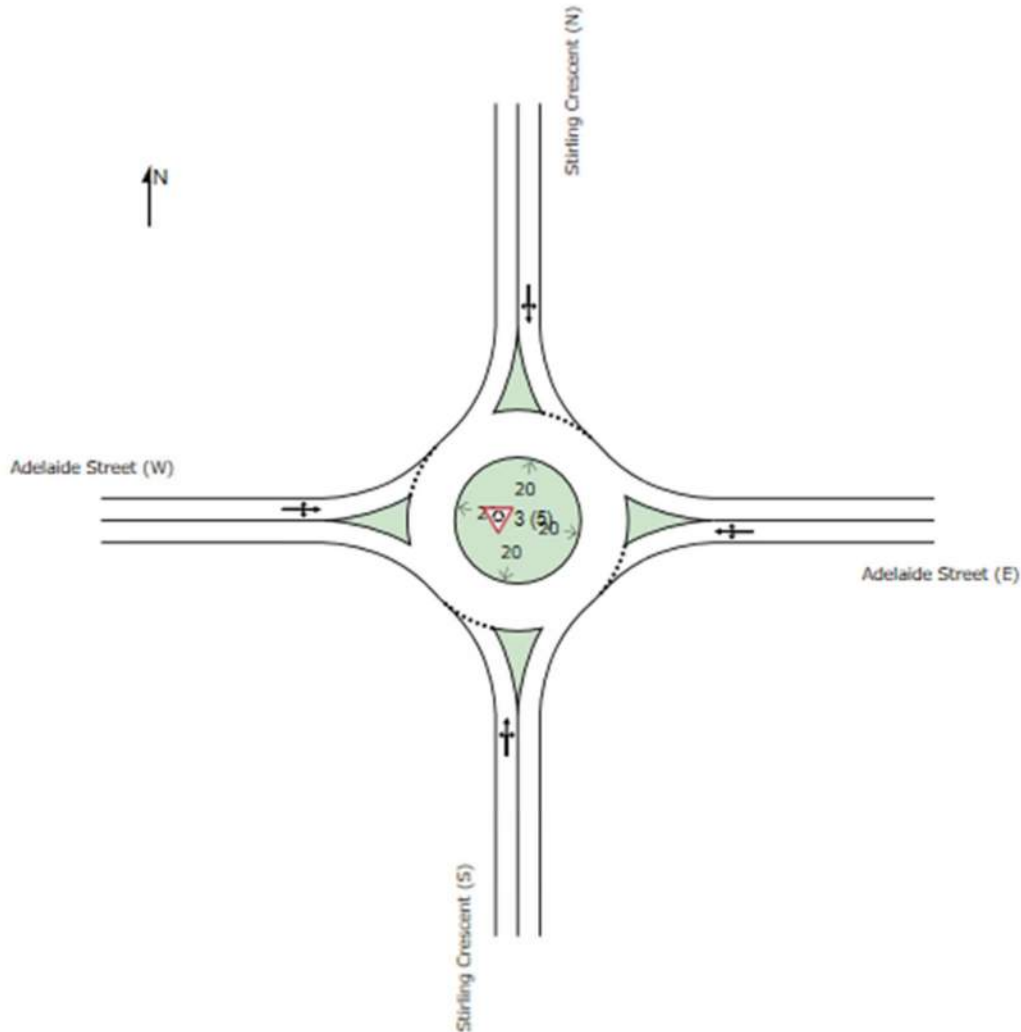


Table 19 SIDRA Results - Adelaide Street / Stirling Crescent - Scenario 1

Intersection Approach	Turn	AM Peak				PM Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Stirling Crescent (S)	L	0.129	4.5	A	5.9	0.156	4.6	A	7.4
	T	0.129	4.7	A	5.9	0.156	4.8	A	7.4
	R	0.129	9.4	A	5.9	0.156	9.5	A	7.4
	L	0.075	5.5	A	3.6	0.092	5.8	A	4.4

Adelaide Street (E)	T	0.075	5.6	A	3.6	0.092	5.9	A	4.4
	R	0.075	10.4	B	3.6	0.092	10.7	B	4.4
Stirling Crescent (N)	L	0.065	5.1	A	2.7	0.08	5.3	A	3.4
	T	0.065	5.3	A	2.7	0.08	5.5	A	3.4
	R	0.065	10	A	2.7	0.08	10.2	B	3.4
Adelaide Street (W)	L	0.141	4.7	A	7.4	0.171	4.9	A	9.2
	T	0.141	4.9	A	7.4	0.171	5	A	9.2
	R	0.141	9.6	A	7.4	0.171	9.8	A	9.2

Table 20 SIDRA Results – Adelaide Street / Stirling Crescent – Scenario 2

Intersection Approach	Turn	AM Peak				PM Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Stirling Crescent (S)	L	0.204	4.5	A	10.3	0.203	4.6	A	10.3
	T	0.204	4.7	A	10.3	0.203	4.8	A	10.3
	R	0.204	9.4	A	10.3	0.203	9.5	A	10.3
Adelaide Street (E)	L	0.081	6	A	3.8	0.103	6.6	A	5
	T	0.081	6.1	A	3.8	0.103	6.8	A	5
	R	0.081	10.9	B	3.8	0.103	11.5	B	5
Stirling Crescent (N)	L	0.07	5.5	A	2.9	0.089	6.1	A	3.8
	T	0.07	5.7	A	2.9	0.089	6.3	A	3.8
	R	0.07	10.4	B	2.9	0.089	10.9	B	3.8
Adelaide Street (W)	L	0.188	4.7	A	10.3	0.251	4.9	A	14.6
	T	0.188	4.9	A	10.3	0.251	5.1	A	14.6
	R	0.188	9.6	A	10.3	0.251	9.8	A	14.6

7.4.9 Stirling Crescent – Site Access 2

The SIDRA layout adopted for Stirling Crescent / Site Access 2 intersection is shown in Figure 28.

The analysis results for the intersection are presented in and Table 21 and Table 22, which show that the access will operate satisfactorily across all legs and will maintain LOS A and DOS <0.8 even during full development.

Figure 28 SIDRA Layout – Stirling Crescent / Site Access 2

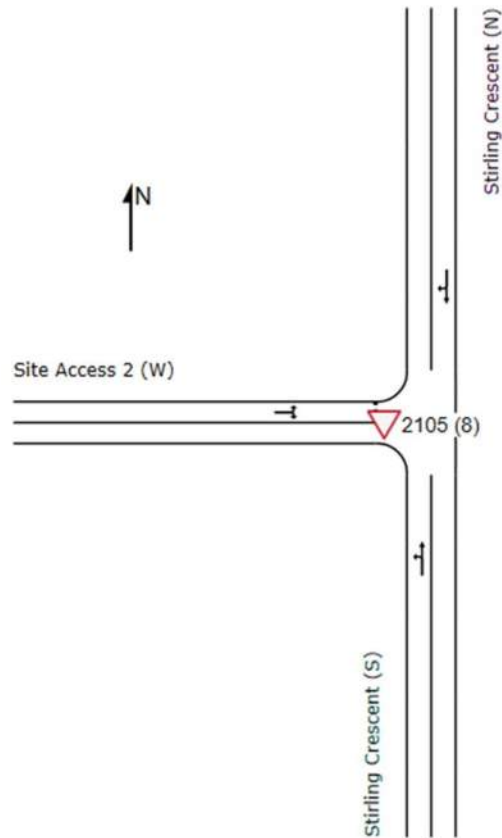


Table 21 SIDRA Results – Stirling Crescent / Site Access 2 – Scenario 1

Intersection Approach	Turn	AM Peak				PM Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Stirling Crescent (S)	L	0.09	5.7	A	0	0.108	5.7	A	0
	T	0.09	0	A	0	0.108	0	A	0
Stirling Crescent (N)	T	0.09	0	A	0.1	0.108	0	A	0.1
	R	0.09	5.7	A	0.1	0.108	5.7	A	0.1
Site Access 2 (W)	L	0.002	5.2	A	0.1	0.002	5.3	A	0.1
	R	0.002	6	A	0.1	0.002	6.3	A	0.1

Table 22 SIDRA Results - Stirling Crescent / Site Access 2 – Scenario 2

Intersection Approach	Turn	AM Peak				PM Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Stirling Crescent (S)	L	0.135	5.7	A	0	0.119	5.7	A	0
	T	0.135	0	A	0	0.119	0	A	0

Stirling Crescent (N)	T	0.097	0.3	A	2	0.152	0	A	0.6
	R	0.097	6.6	A	2	0.152	6.2	A	0.6
Site Access 2 (W)	L	0.011	5.5	A	0.3	0.039	5.4	A	1.1
	R	0.011	6.5	A	0.3	0.039	7.1	A	1.1

7.4.10 Stirling Crescent / Kalamunda Road

The SIDRA layout adopted for Stirling Crescent / Kalamunda Road intersection is shown in **Figure 29**. The results of the analysis for the intersection are presented in **Table 23** and **Table 24**.

It is indicative that overall, the intersection will perform poorly due to the significant delays anticipated for either peak hour periods or assessment scenarios considered.

High volumes of background through traffic along Kalamunda Road causes right turn movements along Stirling Crescent and Kalamunda Road to perform poorly since right-turning vehicles have to wait to be able to safely cross the intersections. This results in a significant buildup of traffic and extended delays.

Future road developments such as the Great Eastern Highway Bypass Interchanges Project and related works are expected to improve overall network performance.

Figure 29 SIDRA Layout - Stirling Crescent / Kalamunda Road

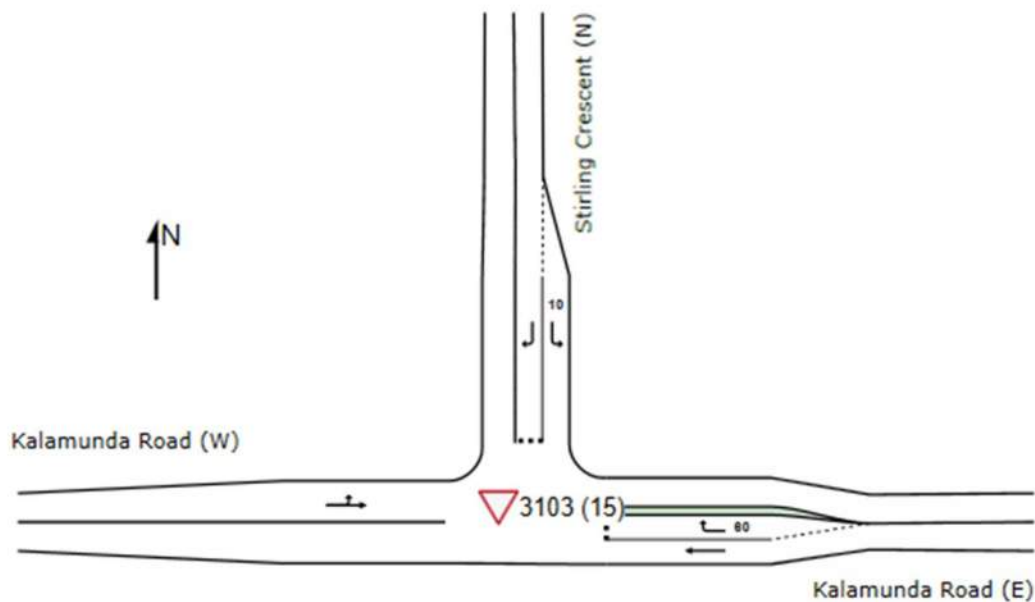


Table 23 SIDRA Results - Stirling Crescent / Kalamunda Road- Scenario 1

Intersection Approach	Turn	AM Peak				PM Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Kalamunda Road (E)	T	0.489	0.5	A	0	0.289	0.2	A	0
	R	0.065	7.1	A	2.2	0.224	14.8	B	6.4
Stirling Crescent (N)	L	0.067	6.9	A	2.2	0.209	16.5	C	5.9
	R	0.76	71.4	F	23.4	1.771	791	F	233.1

Kalamunda Road (W)	L	0.179	5.7	A	0	0.485	5.7	A	0
	T	0.179	0	A	0	0.485	0.1	A	0

Table 24 SIDRA Results – Stirling Crescent / Kalamunda Road – Scenario 2

Intersection Approach	Turn	AM Peak				PM Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Kalamunda Road (E)	T	0.566	0.4	A	0	0.299	0.2	A	0
	R	0.317	20	C	8.9	0.4	20.9	C	11.9
Stirling Crescent (N)	L	0.254	103.6	F	7.1	0.363	40.1	E	11.4
	R	7.985	6535.4	F	508.3	4.944	3684.2	F	684.7
Kalamunda Road (W)	L	0.545	5.7	A	0	0.543	5.7	A	0
	T	0.545	0.1	A	0	0.543	0.1	A	0

Based on SIDRA analysis, the existing intersection at Stirling Crescent / Kalamunda Road will operate at a very poor level at full LSP buildout. A potential mitigation to the poor performance could be the conversion of the intersection into a roundabout layout as shown in **Figure 30**. The results show a significant improvement in intersection performance as seen in **Table 25**, with all legs experiencing LOS A-B and a maximum DOS at 0.566, which is below the Austroads threshold for roundabouts.

It should be noted that while the roundabout performs better than the existing priority-controlled intersection, the capacity of the road reserve to accommodate the modelled roundabout configuration will need to be assessed first. In addition, the proposed Local Structure Plan does not explicitly consider this intersection as a roundabout and this option was only considered in this assessment to present potential mitigation measures.

Alternatively, movement restrictions at this intersection, such as banning right turns, may be implemented as a more cost-effective option but may result in redistribution of traffic and decline of performance in other intersections within the network.

Figure 30 SIDRA Layout – Stirling Crescent / Kalamunda Road – Roundabout

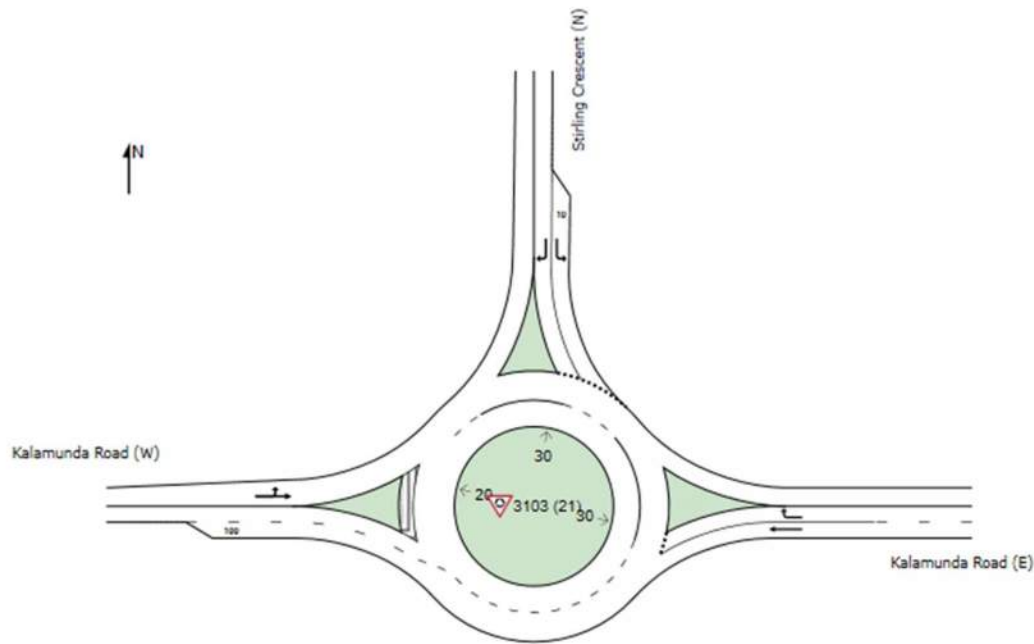


Table 25 SIDRA Results – Stirling Crescent / Kalamunda Road – Scenario 2 – Roundabout

Intersection Approach	Turn	AM Peak				PM Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Kalamunda Road (E)	T	0.566	4.5	A	0	0.299	4.3	A	0
	R	0.116	10.2	B	5.3	0.161	10.8	B	7.4
Stirling Crescent (N)	L	0.164	12.6	B	7.7	0.085	3.7	A	0
	R	0.156	16.7	B	8	0.228	16.5	B	11.8
Kalamunda Road (W)	L	0.545	3.9	A	0	0.543	3.9	A	0
	T	0.545	3.8	A	0	0.543	3.8	A	0

Increasing the intensity of development as proposed within the LSP will result in an increase in the overall traffic and a decrease in intersection performance for non-upgraded intersections. There is no requirement for the intersections to be upgraded, however, the TIA report should provide upgrade options as required by the WAPC guidelines. However, it should be noted that the intersections will operate under worsening LOS in the future, even without development traffic.

7.4.11 Kalamunda Road – Site Access 3

The SIDRA layout adopted for the Kalamunda Road / Site Access 3 is shown in **Figure 31**. The analysis results for the intersection are presented in **Table 26** and **Table 27**.

The results indicate that the intersection operates satisfactorily in Scenario 1, with a maximum delay of 12.7 seconds at LOS B in the PM Peak. In Scenario 2, the maximum delay is anticipated to be 34.4 seconds, which occurs at the right turn lane of Site Access 3 in the AM peak hour period.

Overall, Scenario 2 reflects a shift from free flow to moderately constrained conditions, with the most significant effects on the eastbound approach and site access due to trips generated by the LSP. While performance remains generally acceptable, the increase in queue lengths, particularly on the east approach, may warrant consideration or intersection upgrades if traffic volumes increase further in the future.

Figure 31 SIDRA Layout - Kalamunda Road - Site Access 3

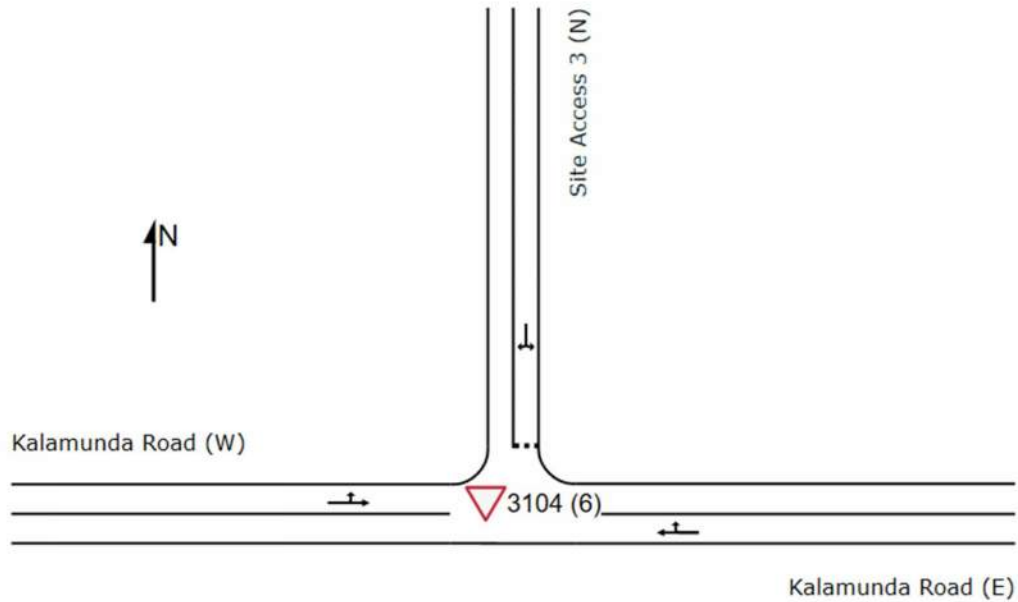


Table 26 SIDRA Results - Kalamunda Road / Site Access 3 - Scenario 1

Intersection Approach	Turn	AM Peak				PM Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Kalamunda Road (E)	T	0.52	0	A	0.1	0.334	0	A	0.2
	R	0.52	5.7	A	0.1	0.334	7	A	0.2
Site Access 3 (N)	L	0.003	6	A	0.1	0.006	12.7	B	0.1
	R	0.003	9.5	A	0.1	0.006	12	B	0.1
Kalamunda Road (W)	L	0.191	5.7	A	0	0.519	5.8	A	0
	T	0.191	0	A	0	0.519	0.2	A	0

Table 27 SIDRA Results - Kalamunda Road / Site Access 3 - Scenario 2

Intersection Approach	Turn	AM Peak				PM Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Kalamunda Road (E)	T	0.762	12.8	B	94.4	0.402	0.8	A	4.9
	R	0.762	28.9	D	94.4	0.402	14.1	B	4.9
	L	0.288	18.5	C	5.2	0.553	19.4	C	15

Site Access 3 (N)	R	0.288	34.4	D	5.2	0.553	19.7	C	15
Kalamunda Road (W)	L	0.628	5.9	A	0	0.557	5.9	A	0
	T	0.628	0.3	A	0	0.557	0.2	A	0

7.4.12 Abernethy Road / Kalamunda Road

The SIDRA layout adopted for the Abernethy Road / Kalamunda Road is shown in **Figure 32**. The analysis results for the intersection are presented in **Table 28** and **Table 29**.

In Scenario 1 several movements operating at LOS F and degrees of saturation exceeding 1.0, particularly on the Abernethy Road south and Kalamunda Road west approaches in the PM. Delays are substantial (up to with very long queues (up to 635 m). Some movements, particularly on the north approach, continue to operate at acceptable levels.

Scenario 2 demonstrates most movements across all approaches operating at LOS F in both peaks. Delays increase further (exceeding 200 seconds), and queues are significantly longer (up to 732 m), indicating more widespread and consistent oversaturation. This may be attributed to the high volumes along Abernethy Road and the diversion of traffic from Stirling Crescent due to the closure of its intersection at Great Eastern Highway Bypass. Further detailed assessment should be undertaken to determine the most suitable mitigation measures.

High volumes of through traffic along Kalamunda Road and Abernethy Road causes turning movements along to perform poorly since vehicles have to wait to be able to safely cross the intersections. This results in a significant buildup of traffic and extended delays.

Overall, the assessment results indicate that the intersection will perform poorly and at capacity with just the projected background traffic growth by 2041. With the introduction of development traffic upon full development (under Scenario 2), the intersection will likely operate beyond its practical capacity, wherein significant delays and queueing are anticipated.

Figure 32 SIDRA Layout – Abernethy Road / Kalamunda Road

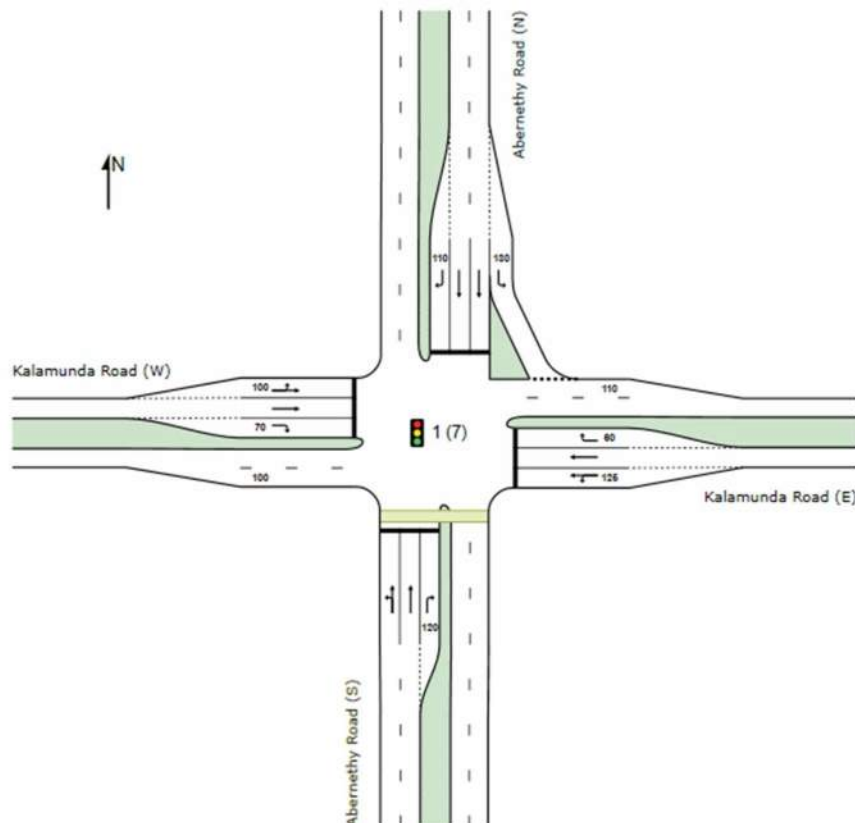


Table 28 SIDRA Results – Abernethy Road / Kalamunda Road – Scenario 1

Intersection Approach	Turn	AM Peak				PM Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Abernethy Road (S)	L	0.711	38.4	D	136.1	1.130	174.5	F	635.2
	T	0.711	52.5	D	136.1	1.13	186.5	F	635.2
	R	0.811	77.3	E	37.4	1.132	203.2	F	233.2
Kalamunda Road (E)	L	0.489	31.3	C	115.4	0.576	34.4	C	82.8
	T	0.811	52.9	D	218	0.956	75.6	E	183.4
	R	0.298	71.8	E	33.6	0.245	72	E	12.3
Abernethy Road (N)	L	0.035	7.1	A	2.3	0.101	13.2	B	11.6
	T	0.811	53.9	D	163.6	0.421	30.3	C	87.7
	R	0.275	70.9	E	11.7	0.155	52.3	D	14.8
Kalamunda Road (W)	L	0.18	26.5	C	36.6	0.739	33	C	110.8
	T	0.275	29.1	C	58.8	1.132	137.3	F	316.1
	R	0.811	64.9	E	106.9	1.131	204.6	F	108.8

Table 29 SIDRA Results – Abernethy Road / Kalamunda Road – Scenario 2

Intersection Approach	Turn	AM Peak				PM Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Abernethy Road (S)	L	0.964	72	E	235.7	1.192	225.1	F	731.7
	T	0.964	85.7	F	235.7	1.192	237.9	F	731.7
	R	0.962	93.1	F	103.8	1.193	255.2	F	319.2
Kalamunda Road (E)	L	0.58	34.3	C	137	0.718	39.2	D	112.1
	T	0.962	86.7	F	313.6	1.191	212.7	F	362.2
	R	0.385	80.6	F	38.1	0.525	80.8	F	25.9
Abernethy Road (N)	L	0.075	8.1	A	5.4	0.114	13.2	B	12.6
	T	0.921	69.7	E	200.6	0.556	32.7	C	120.5
	R	0.135	61.4	E	10.6	0.135	49.7	D	14.3
Kalamunda Road (W)	L	0.218	25.4	C	42.7	0.779	33.4	C	114.9
	T	0.333	33.4	C	68.7	1.192	170.5	F	361.9
	R	0.964	90.3	F	130.5	1.191	257.7	F	123.8

Figure 33 shows the indicative layout of the Abernethy Road / Kalamunda Road intersection with lane duplications, including the addition of right turn lanes at the south and west approach legs. In addition, signal optimisation was also considered.

Results of the analysis in Table 30 show some improvement across all legs with the maximum delay anticipated to be 84.1 seconds for the right turn lane of the south approach leg in the PM peak period. However, this right turn movement will still operate at LOS F with a DOS of 0.952 and with an expected queue length of 93m.

Figure 33 SIDRA Layout - Abernethy Road / Kalamunda Road - With Improvements

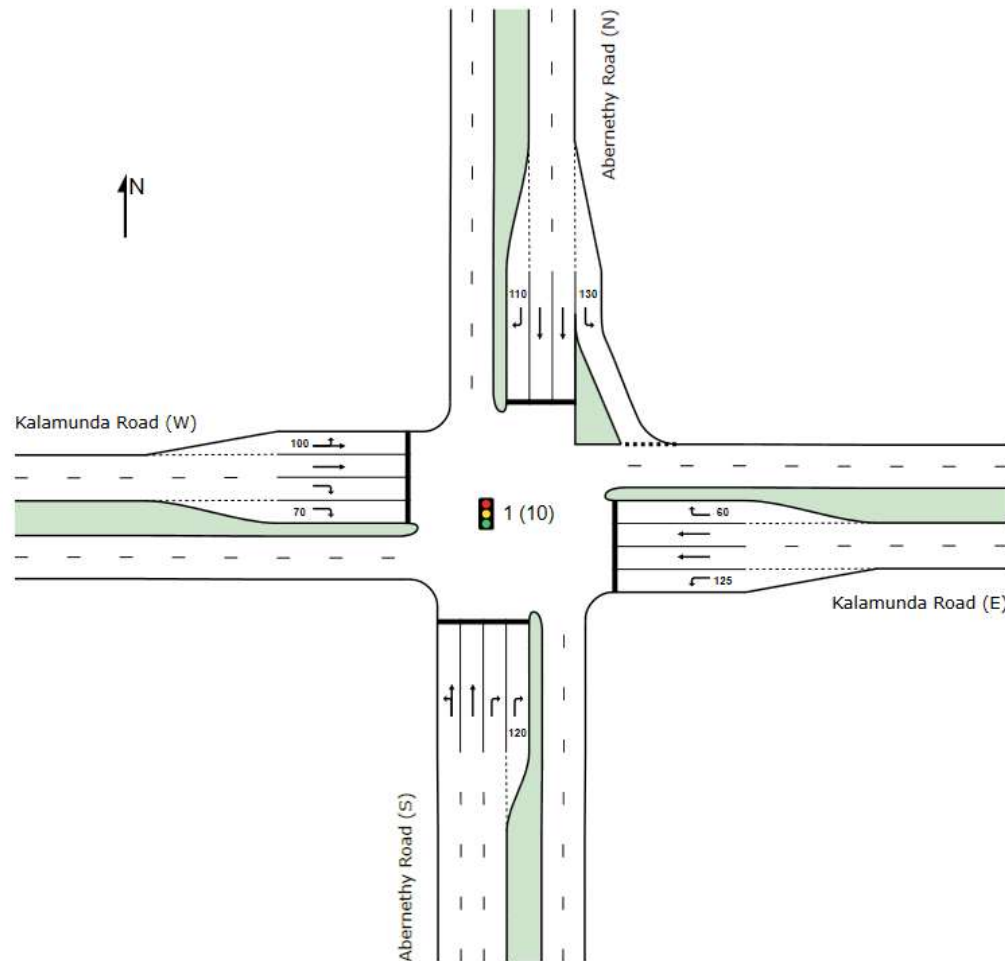


Table 30 SIDRA Results - Abernethy Road / Kalamunda Road - Scenario 2 - With Improvements

Intersection Approach	Turn	AM Peak				PM Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
Abernethy Road (S)	L	0.64	32.2	C	152.3	0.953	61.6	E	413.1
	T	0.640	40.6	D	152.3	0.953	64.2	E	413.1
	R	0.640	69.4	E	42.2	0.952	84.1	F	93
Kalamunda Road (E)	L	0.363	31.7	C	81.4	0.29	32.9	C	53.3
	T	0.640	44.5	D	132	0.712	47	D	101.3
	R	0.511	70	E	40.1	0.645	66.4	E	26.9

Abernethy Road (N)	L	0.067	7.3	A	5	0.101	11.2	B	12.6
	T	0.607	37.9	D	142.4	0.457	25.8	C	106.7
	R	0.179	65.5	E	11.1	0.215	57.3	E	15.7
Kalamunda Road (W)	L	0.324	31.6	C	59.9	0.952	60.2	E	177.8
	T	0.324	38.2	D	60	0.952	72.4	E	177.8
	R	0.640	65.4	E	51.5	0.733	67.7	E	31.1

It is noted that the proposed improvements at this intersection will perform better than the existing configuration. However, the capacity of the road reserve to accommodate these improvements will need to be assessed first. In addition, the proposed Local Structure Plan does not explicitly propose any lane duplications at this intersection and was only considered in this assessment to present potential mitigation measures.

7.5 Access Strategy

As discussed in Section 4.1, all future development traffic will access the site via a defined network of connections. Traffic from light industrial lots currently using Hatch Court will be redirected to Adelaide Street via the proposed Peak Court connection, following the conversion of the Hatch Court/Stirling Crescent intersection to a cul-de-sac.

Light Industry Lots 200 and 201 will be served by access crossovers to Kalamunda Road and Stirling Crescent, while residential access will be provided from Stirling Crescent via a proposed internal road linking to Wem Mews. Overall, the access strategy distributes traffic across multiple connections to support safe and efficient operation.

7.6 Restricted Access Vehicles (RAV) Network

As part of the Great Eastern Highway Bypass Interchanges project, a RAV 7 connection is proposed along Adelaide Street. Heavy vehicles are likely to utilise Adelaide Street to access the industrial area.

7.7 Pedestrian and Cycling Network

As discussed in Section 3.3, no internal pedestrian/cycling network are proposed within the light industry component of the LSP area, reflecting their primary function of accommodating private and heavy vehicle movements associated with the intended land use.

Accordingly, there is a proposed 1.8m-wide footpath along the proposed access road to the residential lots as discussed in Section 4.5 which may be able to connect to the existing footpath located along Stirling Crescent and Wem Mews as discussed in Section 3.4. This connection will facilitate pedestrian permeability and improve accessibility to and within the residential component of the LSP area.

7.8 Public Transport Access

As discussed in Section 3.5, there is an existing route that is available within the southern section of the LSP area which also has a nearby bus stop along Kalamunda Road. A 500-metre walking catchment for the nearest bus stop was conducted, as shown in

Figure 34, as WAPC guidelines indicate that 90% of street addresses within an LSP area should be within this radius of a Transperth Bus Stop. The assessment indicates that Light Industry Lots 200 and 201 fall within the catchment, along with approximately 40% of the proposed residential lots. This demonstrates partial, but not comprehensive, coverage of the LSP area.

Figure 34 Bus Stop Catchment Area (500 metres)



As outlined in **Section 4.6**, no internal public transport routes are currently proposed within the LSP area. Combined with the existing close spacing of stops along Kalamunda Road, this limits the justification for additional services penetrating the site. Consequently, the development is unlikely to meet WAPC accessibility thresholds for public transport in its current form.

A potential future bus route along Stirling Crescent, with a stop near the Hatch Court cul-de-sac, could improve overall accessibility. However, delivery of such a service is contingent on broader development progression and funding availability and therefore cannot be relied upon at this stage.

8 SAFETY ISSUES

8.1 Crash Assessment

A crash assessment for the surrounding road network of the Site has been completed using Main Roads WA Reporting Centre. The assessment covers all the recorded crashes for the 5-year period between 1 January 2020 to 31 December 2024 along the roads surrounding the Site.

The crash locations and severity of these crashes for intersection and midblock crashes are illustrated in Figure 35 while Table 31 to Table 38 provides the summary of all crashes that occurred within the vicinity of the Site.

Table 31 Total Crashes

Crash Nature	Fatal	Hospital	Medical	PDO Major	PDO Minor	Total Crashes
Right Turn Thru	-	-	-	1		1
Right Angle	-	-	3	5	1	9
Rear End	-	1	6	6	5	18
Sideswipe Same Direction	-	-	-	3	1	4
Hit Animal	-	-	-	1		1
Hit Object	-	-	-	2	1	3
Unspecified	-	-	-	2	1	3
Total	-	1	9	20	9	39

Table 32 Stirling Crescent – Adelaide St Intersection Crashes

Crash Nature	Fatal	Hospital	Medical	PDO Major	PDO Minor	Total Crashes
Right Angle	-	-	1	4	-	5
Unspecified	-	-	-	2	-	2
Total	-	-	1	6	-	7

Table 33 Stirling Crescent – Kalamunda Rd Intersection Crashes

Crash Nature	Fatal	Hospital	Medical	PDO Major	PDO Minor	Total Crashes
Right Angle	-	-	2	1	-	3
Rear End	-	-	1	2	-	3
Right Turn Thru	-	-	-	1	1	2
Hit Object	-	-	-	-	1	1
Total	-	-	3	4	2	9

Table 34 Kalamunda Rd - Abernethy Rd Intersection Crashes

Crash Nature	Fatal	Hospital	Medical	PDO Major	PDO Minor	Total Crashes
Right Angle	-	-	1	-	-	1
Rear End	-	-	3	4	2	9
Sideswipe Same Dirn	-	-	-	-	1	1
Hit Object	-	-	-	1	-	1
Unspecified	-	-	-	-	1	1
Total	-	-	4	5	4	13

Table 35 Adelaide St - Abernethy Rd Intersection Crashes

Crash Nature	Fatal	Hospital	Medical	PDO Major	PDO Minor	Total Crashes
Rear End	-	1	-	-	-	1
Total	-	1	-	-	-	1

Table 36 Stirling Crescent Midblock Crashes

Crash Nature	Fatal	Hospital	Medical	PDO Major	PDO Minor	Total Crashes
Right Angle	-	-	-	-	1	1
Rear End	-	-	-	-	1	11
Sideswipe Same Dirn	-	-	-	1	-	
Hit Animal	-	-	-	1	-	1
Total	-	-	-	2	2	4

Table 37 Kalamunda Road Midblock Crashes

Crash Nature	Fatal	Hospital	Medical	PDO Major	PDO Minor	Total Crashes
Rear End	-	-	1	-	1	2
Sideswipe Same Dirn	-	-	-	1	-	1
Hit Object	-	-	-	1	-	1
Total	-	-	1	2	1	4

Table 38 Abernethy Road Midblock Crashes

Crash Nature	Fatal	Hospital	Medical	PDO Major	PDO Minor	Total Crashes
--------------	-------	----------	---------	-----------	-----------	---------------

Sideswipe Same Dirn	-	-	-	1	-	1
Total	-	-	-	-	-	1

Figure 35 Crash Locations



Source: Main Roads WA Reporting Centre

Crash data is summarised as follows:

- » A total of thirty-nine (39) crashes were recorded within the vicinity of the Site, with no fatal crashes recorded.
- » Seven (7) crashes were located at the intersection of Stirling Crescent and Adelaide Street which resulted in 1 Medical and 6 PDO Major.
- » Nine (9) crashes were recorded at the intersection of Stirling Crescent and Kalamunda Road which resulted in 3 Medical, 4 PDO Major, and 2 PDO Minor.
- » Thirteen (13) crashes occurred at the intersection of Kalamunda Road and Abernethy Road which resulted in 4 Medical, 5 PDO Major, and 4 PDO Minor.
- » One (1) intersection crash is recorded at Abernethy Road – Adelaide Street.
- » Four (4) midblock crashes were recorded along Stirling Crescent between Adelaide Street and Kalamunda Road, with two (2) crashes resulting in major property damage.
- » Four (4) midblock crashes were recorded along Kalamunda Road, between Stirling Crescent and Abernethy Road which resulted in 1 Medical crash.
- » One (1) midblock crash was reported along Abernethy Road, between Kalamunda Road and Adelaide Street.

Overall, the recorded crash history does not indicate any significant road safety issues that are likely to be exacerbated by the development of the LSP. The distribution of crashes in the study area generally corresponds to the higher traffic volumes along Kalamunda Road.

The number of crashes recorded at the Stirling Crescent/Adelaide Street intersection is indicative of the current 'rural' type road layout with growing traffic volumes resulting from the surrounding residential and industrial developments.

There are two significant planned changes to the road network that will likely reduce the frequency and severity of crashes at this location in the near future:

- » Closure of Stirling Crescent at Great Eastern Highway Bypass will significantly reduce the volume of traffic using Stirling Crescent as a through route between Kalamunda Road and Great Eastern Highway Bypass. Due to the altered access arrangements, this traffic will likely divert via Kalamunda and Abernethy Roads, with only local traffic using Stirling Crescent.
- » Construction of a roundabout at the Stirling Crescent / Adelaide Street intersection. The roundabout intersection will likely eliminate right-angle crashes at this intersection as well as reduce the speed of vehicles through the intersection.

9 CONCLUSIONS

This Transport Impact Assessment has been prepared in accordance with the *WAPC Transport Assessment Guidelines for Developments: Volume 2 – Planning Schemes, Structure Plans and Activity Centre Plans* (2016).

The following conclusions have been made in regard to the proposed Local Structure Plan:

- » The proposed LSP is located in a predominantly residential area with industrial lots within High Wycombe in the City of Kalamunda. It is bounded by Kalamunda Road, Stirling Crescent, and Adelaide Street.
- » The proposed LSP is estimated to yield 21.57 ha of industrial land and 4.9126 ha of residential lots.
- » Public transport is considered to be good since there are several bus stops and routes along the Site's boundaries.
- » Access strategy to the proposed LSP areas is summarised as follows:
 - Industrial lots will have at least three (3) access points: one will be via Adelaide Street through Peak Court and for industrial lots fronting Hatch Court. For industrial lots within Lots 200 and 201, one access point is proposed along Stirling Crescent, and another access point is proposed along Kalamunda Road, and
 - An intersection at Stirling Crescent connecting to Wem Mews Road and Acton Link is proposed for access to the residential lots.
- » Due to the significant traffic volume, Other Regional Road status and existing residential developments fronting Kalamunda Road adjacent to the LSP site, access directly from the Kalamunda Road frontage is to be limited to a single crossover, proposed to remain as currently located. Similarly with Stirling Crescent, no additional crossovers are to be permitted under the LSP for future developments due to the desire to retain as much "residential amenity" for the Stirling Crescent road environment as practicable.
- » Pedestrian and cycle routes are considered to be average since there are discontinuities in the network and some roads do not have dedicated pedestrian paths.
- » Analysis of the key intersections on the external road network has been undertaken with the following conclusions:
 - The Abernethy Road / Adelaide Street / Brinsmead Road roundabout is expected to perform satisfactorily on either assessment scenarios considered.
 - The Adelaide Street / Site Access 1 – Peak Court intersection is expected to maintain satisfactory performance in both scenarios with most legs experiencing LOS A.
 - The Adelaide Street / Stirling Crescent roundabout is also expected to operate satisfactorily in both scenarios with a maximum LOS B and DOS <0.85.
 - The Stirling Crescent / Site Access 2 intersection is expected to maintain LOS A and DOS <0.8 even after full development.
 - The Kalamunda Road / Stirling Crescent Intersection is anticipated to operate beyond practical capacity considering the 2041 background traffic volumes only. The intersection's performance will further deteriorate considering the addition of LSP-generated traffic with significant delays and vehicle queueing anticipated particularly at the north leg's (Stirling Crescent) right turning lane. It is noted that the roundabout configuration is considered as a potential mitigation measure only and that the ability to accommodate a roundabout within the existing available road reserve would need to be investigated in detail. Alternatively, movement restrictions at this intersection, such as banning right turns, may be implemented as a more cost-effective option but may result in redistribution of traffic and decline of performance in other intersections within the network.
 - The Kalamunda Road / Site Access 3 intersection will generally operate satisfactorily in both assessment scenarios. However, Scenario 2 reflects a shift to moderately constrained conditions, with impacts concentrated on the eastbound approach and site access; while performance remains acceptable, increased queuing may warrant future monitoring or upgrades.
 - Analysis of the Abernethy Road / Kalamunda Road intersection indicates that the intersection operates under poor conditions in both scenarios, with Scenario 1 showing several movements, particularly on the Abernethy Road south and Kalamunda Road west approaches, operating at LOS F in the PM peak. In Scenario 2, performance is further degraded, with most movements operating at LOS F in both peak periods, indicating widespread oversaturation likely associated with high traffic volumes on Abernethy Road and redistributed traffic. SIDRA analysis show that the considered potential mitigation measure such as lane duplication and signal optimisation will result in significant improvements in the performance of the intersection.

Appendix A

WAPC Checklist



APPENDIX A – WAPC CHECKLIST

Item	Status	Comments/Proposal
Summary		
Introduction/Background	Section 1	
Structure Plan Proposal		
Regional Context	Section 2	
Proposed Land Uses	Section 2	
Table Of Land Uses and Quantities	Section 2	
Major Attractors/Generators	Section 2	
Specific Issues	Section 2	
Existing Situation		
Existing Land Uses within Structure Plan	Section 3	
Existing Land Uses within 800 Metres of Structure Plan Area	Section 3	
Existing Road Network within 2 (or 5) km of Structure Plan Area	Section 3	
Existing Pedestrian/Cycle Networks within Structure Plan Area	Section 3	
Existing Pedestrian/Cycle Networks within 800m of Structure Plan Area	Section 3	
Existing Public Transport Services	Section 3	
Existing Traffic Flows	Section 3	
Existing Restricted Access Vehicle	Section 3	
Proposed Internal Transport Networks		
Connections to External Road Network	Section 4	
Road Reservation Widths and Cross Sections	Section 4	
Intersection Controls	Section 4	
Speed Limits	Section 4	
Pedestrian/Cycle Networks and Crossing Facilities	Section 4	
Public Transport Routes	Section 4	
Changes to External Transport Networks		
Road Network	Section 5	
Pedestrian/Cycle Networks and Crossing Facilities	Section 5	
Public Transport Services	Section 5	
Integration With Surrounding Area		
Trip Attractors/Generators Within 800 Metres	Section 6	

Proposed Changes to Land Uses Within 800 Metres	Section 6	
Travel Desire Lines from Structure Plan to These Attractors/Generators	Section 6	
Adequacy and Deficiencies of External Transport Networks	Section 6	
Analysis of External Transport Networks		
Structure Plan Generated Traffic	Section 7	
Traffic Distribution	Section 7	
Extraneous Traffic	Section 7	
Background Traffic	Section 7	
Daily Traffic Summary	Section 7	
Intersection Performance	Section 7	
Key Intersection Analysis	Section 7	
Sensitivity Analysis	Section 7	
Access Strategy	Section 7	
Restricted Access Vehicle Network	Section 7	
Pedestrian and Cycling Network	Section 7	
Public Transport Access		
Safety Issues	Section 8	
Conclusions	Section 9	

Appendix B

Concept LSP Layout

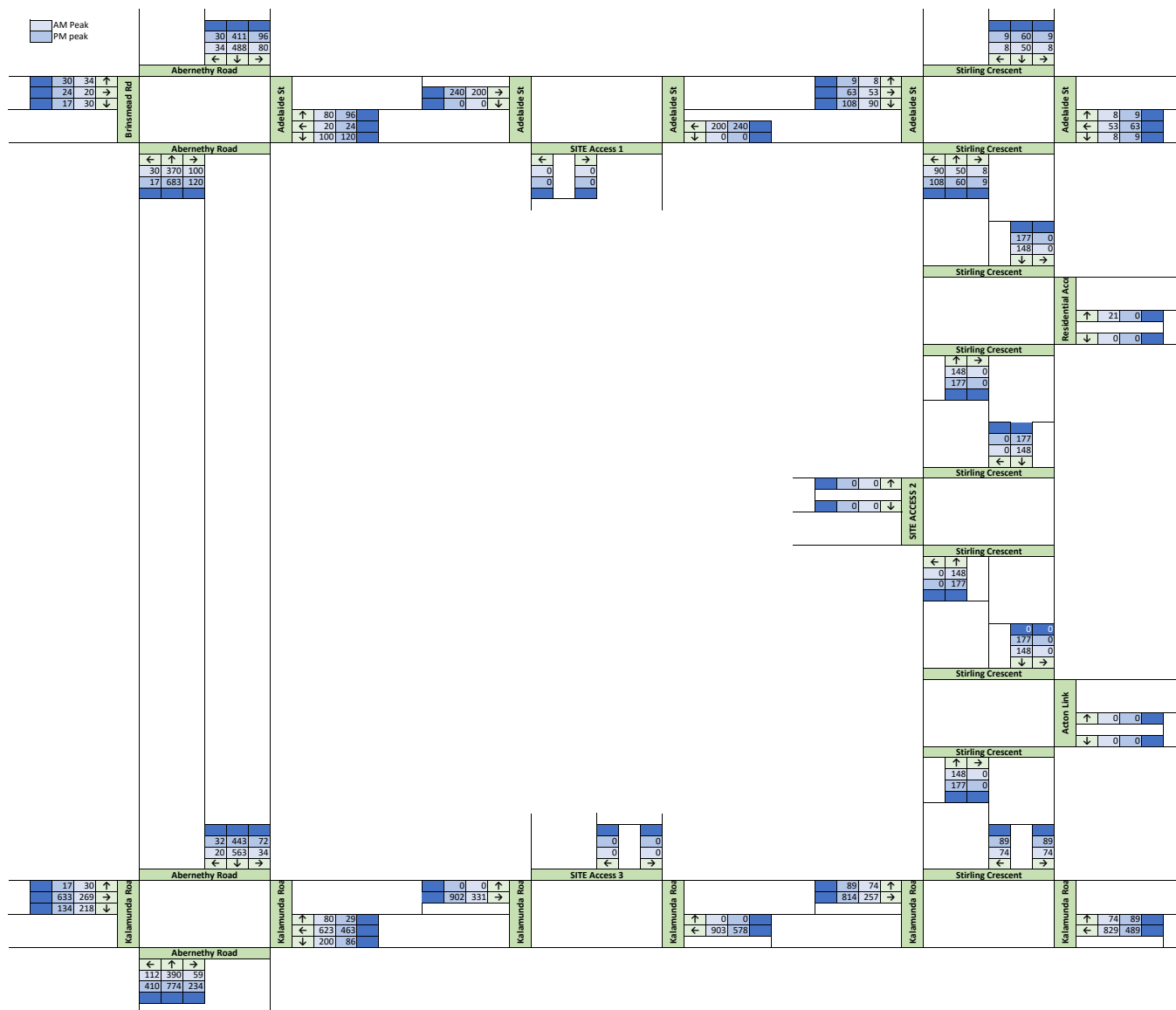




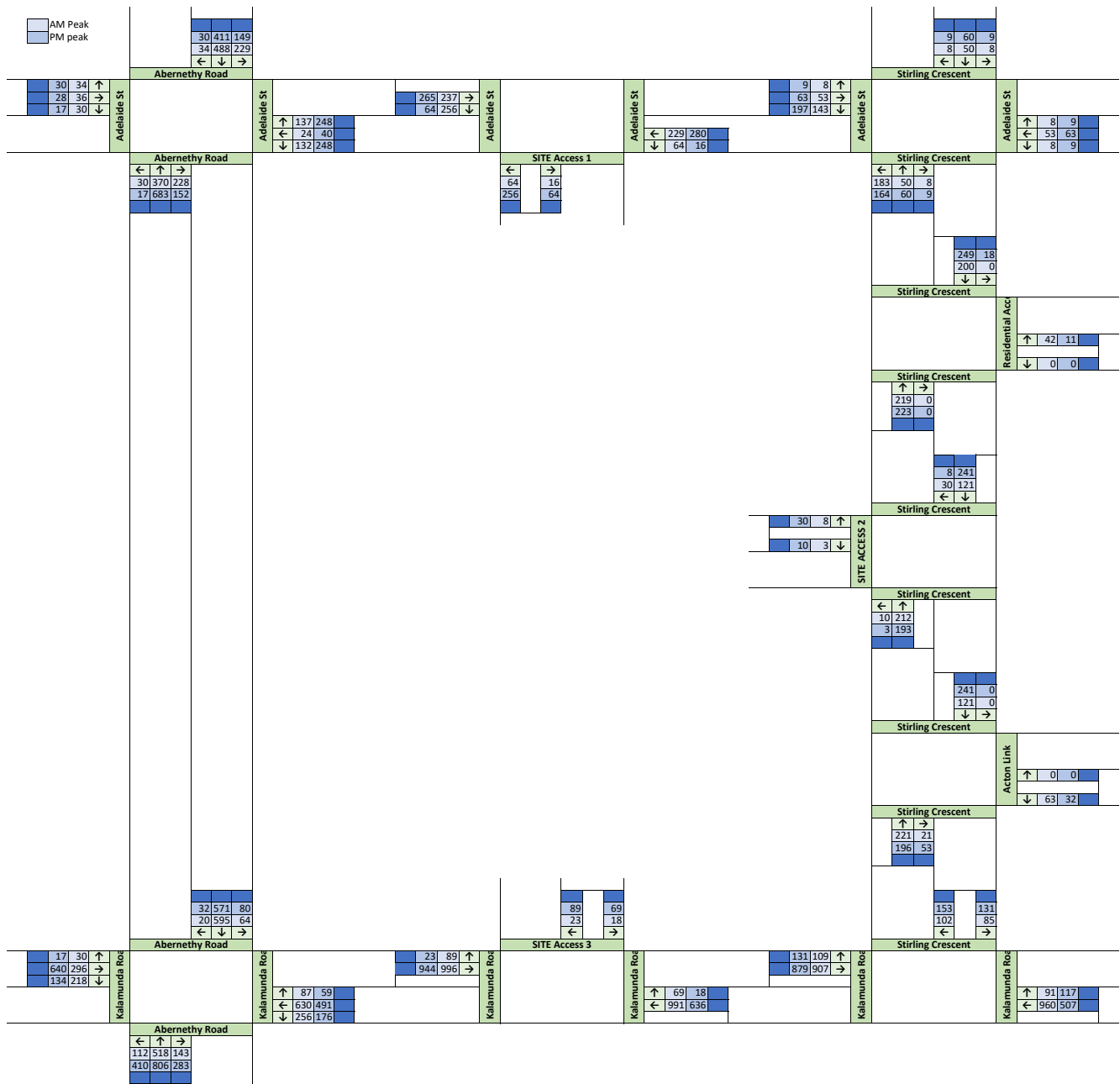
Appendix C

Traffic Volume Diagrams





S1: 2041 BACKGROUND TRAFFIC



S2: 2041 BACKGROUND + DEVELOPMENT TRAFFIC

Appendix D

SIDRA Results



MOVEMENT SUMMARY



Site: [2 (4)] I-1 Adelaide St/Abernethy Rd (S1: BG 2041 - AM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Cycles	Number of Cycles	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh.]	[Dist]		Rate to Depart		
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Abernethy Road (S)															
1	L2	All MCs	32	33.4	32	33.4	0.139	6.0	LOS A	0.7	6.7	0.42	0.50	0.42	46.8
2	T1	All MCs	389	33.4	389	33.4	0.348	5.6	LOS A	2.4	21.3	0.44	0.50	0.44	50.4
3	R2	All MCs	105	33.4	105	33.4	0.348	10.1	LOS B	2.4	21.3	0.44	0.51	0.44	49.2
Approach			526	33.4	526	33.4	0.348	6.6	LOS A	2.4	21.3	0.44	0.50	0.44	49.9
East: Adelaide Road (E)															
4	L2	All MCs	105	33.4	105	33.4	0.156	9.2	LOS A	0.8	7.4	0.68	0.70	0.68	49.3
5	T1	All MCs	21	33.4	21	33.4	0.175	9.1	LOS A	0.9	8.1	0.69	0.76	0.69	40.8
6	R2	All MCs	84	33.4	84	33.4	0.175	13.9	LOS B	0.9	8.1	0.69	0.76	0.69	40.1
Approach			211	33.4	211	33.4	0.175	11.1	LOS B	0.9	8.1	0.69	0.73	0.69	44.8
North: Abernethy Road (N)															
7	L2	All MCs	84	33.4	84	33.4	0.125	6.2	LOS A	0.6	5.6	0.43	0.55	0.43	48.6
8	T1	All MCs	514	33.4	514	33.4	0.453	5.8	LOS A	3.3	29.5	0.49	0.50	0.49	50.5
9	R2	All MCs	36	33.4	36	33.4	0.453	10.4	LOS B	3.3	29.5	0.49	0.50	0.49	42.3
Approach			634	33.4	634	33.4	0.453	6.1	LOS A	3.3	29.5	0.48	0.50	0.48	49.8
West: Brinsmead Road (W)															
10	L2	All MCs	36	42.7	36	42.7	0.151	8.6	LOS A	0.6	5.9	0.59	0.73	0.59	43.8
11	T1	All MCs	21	42.7	21	42.7	0.151	8.4	LOS A	0.6	5.9	0.59	0.73	0.59	45.4
12	R2	All MCs	32	42.7	32	42.7	0.151	13.3	LOS B	0.6	5.9	0.59	0.73	0.59	46.1
Approach			88	42.7	88	42.7	0.151	10.2	LOS B	0.6	5.9	0.59	0.73	0.59	45.1
All Vehicles			1459	34.0	1459	34.0	0.453	7.2	LOS A	3.3	29.5	0.50	0.55	0.50	48.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY



Site: [2 (5)] I-1 Adelaide St/Abernethy Rd (S1: BG 2041 - PM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Cycles	Number of Cycles	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]									
			veh/h	%	veh/h	%	v/c	sec		[Veh. veh	[Dist] m		Rate to Depart		km/h
South: Abernethy Road (S)															
1	L2	All MCs	18	33.4	18	33.4	0.231	6.3	LOS A	1.3	12.0	0.47	0.51	0.47	46.5
2	T1	All MCs	719	33.4	719	33.4	0.576	6.4	LOS A	5.1	46.1	0.57	0.53	0.57	49.9
3	R2	All MCs	126	33.4	126	33.4	0.576	10.7	LOS B	5.1	46.1	0.60	0.53	0.60	48.7
Approach			863	33.4	863	33.4	0.576	7.0	LOS A	5.1	46.1	0.57	0.53	0.57	49.7
East: Adelaide Road (E)															
4	L2	All MCs	126	33.4	126	33.4	0.174	8.5	LOS A	1.0	8.6	0.66	0.67	0.66	49.6
5	T1	All MCs	25	33.4	25	33.4	0.192	8.5	LOS A	1.0	9.3	0.67	0.72	0.67	41.2
6	R2	All MCs	101	33.4	101	33.4	0.192	13.4	LOS B	1.0	9.3	0.67	0.72	0.67	40.4
Approach			253	33.4	253	33.4	0.192	10.5	LOS B	1.0	9.3	0.66	0.70	0.66	45.2
North: Abernethy Road (N)															
7	L2	All MCs	101	33.4	101	33.4	0.137	6.3	LOS A	0.7	6.4	0.45	0.56	0.45	48.5
8	T1	All MCs	433	33.4	433	33.4	0.400	5.8	LOS A	2.8	25.2	0.50	0.50	0.50	50.4
9	R2	All MCs	32	33.4	32	33.4	0.400	10.4	LOS B	2.8	25.2	0.50	0.50	0.50	42.3
Approach			565	33.4	565	33.4	0.400	6.2	LOS A	2.8	25.2	0.49	0.51	0.49	49.7
West: Brinsmead Road (W)															
10	L2	All MCs	32	42.7	32	42.7	0.178	12.4	LOS B	0.8	7.4	0.73	0.83	0.73	41.8
11	T1	All MCs	25	42.7	25	42.7	0.178	11.2	LOS B	0.8	7.4	0.73	0.83	0.73	43.4
12	R2	All MCs	18	42.7	18	42.7	0.178	16.1	LOS B	0.8	7.4	0.73	0.83	0.73	44.4
Approach			75	42.7	75	42.7	0.178	12.9	LOS B	0.8	7.4	0.73	0.83	0.73	43.1
All Vehicles			1756	33.8	1756	33.8	0.576	7.5	LOS A	5.1	46.1	0.56	0.56	0.56	48.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 **Site: [3102 (9)] I-2_Adelaide St/Site Access 1 - Peak Court**

(S1: BG 2041 - AM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

NA

Site Category: (None)

Stop (Two-Way)

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance													
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %	Arrival Flows [Total HV] veh/h %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. Dist] veh m		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Site Access 1 (S) - Peak Court													
30	L2	All MCs	1 10.0	1 10.0	0.001	6.5	LOS A	0.0	0.0	0.32	0.52	0.32	47.5
32	R2	All MCs	1 10.0	1 10.0	0.001	7.8	LOS A	0.0	0.0	0.43	0.58	0.43	46.8
Approach			2 10.0	2 10.0	0.001	7.2	LOS A	0.0	0.0	0.37	0.55	0.37	47.1
East: Adelaide Street (E)													
21	L2	All MCs	1 10.0	1 10.0	0.143	4.7	LOS A	0.0	0.0	0.00	0.00	0.00	47.9
22	T1	All MCs	211 33.4	211 33.4	0.143	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach			212 33.3	212 33.3	0.143	0.1	NA	0.0	0.0	0.00	0.00	0.00	49.9
West: Adelaide Street (W)													
28	T1	All MCs	211 33.4	211 33.4	0.143	0.0	LOS A	0.0	0.1	0.00	0.00	0.00	50.0
29	R2	All MCs	1 10.0	1 10.0	0.143	4.8	LOS A	0.0	0.1	0.00	0.00	0.00	49.3
Approach			212 33.3	212 33.3	0.143	0.0	NA	0.0	0.1	0.00	0.00	0.00	49.9
All Vehicles			425 33.2	425 33.2	0.143	0.1	NA	0.0	0.1	0.00	0.01	0.00	49.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akcelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: C:\Users\SebastianCano\OneDrive - Protest Engineering\Desktop\WORK\Projects\PTG02687 - TIA - Hatch Court Light Industrial Area
LSP\20260707 SIDRA Update\PTG.02687_Hatch Court Light Industrial Area Sidra_sc_2026-07-07.sipx

MOVEMENT SUMMARY

 **Site: [3102 (10)] I-2_Adelaide St/Site Access 1 - Peak Court**
(S1: BG 2041 - PM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

NA
Site Category: (None)
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance													
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %	Arrival Flows [Total HV] veh/h %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh Dist] veh m		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Site Access 1 (S) - Peak Court													
30	L2	All MCs	1 10.0	1 10.0	0.001	6.7	LOS A	0.0	0.0	0.35	0.52	0.35	47.4
32	R2	All MCs	1 10.0	1 10.0	0.002	8.5	LOS A	0.0	0.0	0.47	0.60	0.47	46.3
Approach			2 10.0	2 10.0	0.002	7.6	LOS A	0.0	0.0	0.41	0.56	0.41	46.9
East: Adelaide Street (E)													
21	L2	All MCs	1 10.0	1 10.0	0.172	4.7	LOS A	0.0	0.0	0.00	0.00	0.00	47.9
22	T1	All MCs	253 33.4	253 33.4	0.172	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach			254 33.3	254 33.3	0.172	0.1	NA	0.0	0.0	0.00	0.00	0.00	49.9
West: Adelaide Street (W)													
28	T1	All MCs	253 33.4	253 33.4	0.172	0.0	LOS A	0.0	0.1	0.00	0.00	0.00	50.0
29	R2	All MCs	1 10.0	1 10.0	0.172	4.8	LOS A	0.0	0.1	0.00	0.00	0.00	49.3
Approach			254 33.3	254 33.3	0.172	0.0	NA	0.0	0.1	0.00	0.00	0.00	50.0
All Vehicles			509 33.2	509 33.2	0.172	0.1	NA	0.0	0.1	0.00	0.00	0.00	49.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 **Site: [3 (4)] I-3_Stirling Crescent/Adelaide Street (S1: BG 2041 - AM Peak)**
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance													
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Cycles
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh]	[Dist m]		Rate to Depart
South: Stirling Crescent (S)													
1	L2	All MCs	95	13.3	95	13.3	0.129	4.5	LOS A	0.8	5.9	0.28	0.46
2	T1	All MCs	53	13.3	53	13.3	0.129	4.7	LOS A	0.8	5.9	0.28	0.46
3	R2	All MCs	8	13.3	8	13.3	0.129	9.4	LOS A	0.8	5.9	0.28	0.46
Approach			156	13.3	156	13.3	0.129	4.8	LOS A	0.8	5.9	0.28	0.46
East: Adelaide Street (E)													
4	L2	All MCs	8	33.4	8	33.4	0.075	5.5	LOS A	0.4	3.6	0.39	0.49
5	T1	All MCs	56	33.4	56	33.4	0.075	5.6	LOS A	0.4	3.6	0.39	0.49
6	R2	All MCs	8	33.4	8	33.4	0.075	10.4	LOS B	0.4	3.6	0.39	0.49
Approach			73	33.4	73	33.4	0.075	6.2	LOS A	0.4	3.6	0.39	0.49
North: Stirling Crescent (N)													
7	L2	All MCs	8	13.3	8	13.3	0.065	5.1	LOS A	0.4	2.7	0.39	0.49
8	T1	All MCs	53	13.3	53	13.3	0.065	5.3	LOS A	0.4	2.7	0.39	0.49
9	R2	All MCs	8	13.3	8	13.3	0.065	10.0	LOS A	0.4	2.7	0.39	0.49
Approach			69	13.3	69	13.3	0.065	5.8	LOS A	0.4	2.7	0.39	0.49
West: Adelaide Street (W)													
10	L2	All MCs	8	33.4	8	33.4	0.141	4.7	LOS A	0.8	7.4	0.27	0.53
11	T1	All MCs	56	33.4	56	33.4	0.141	4.9	LOS A	0.8	7.4	0.27	0.53
12	R2	All MCs	95	33.4	95	33.4	0.141	9.6	LOS A	0.8	7.4	0.27	0.53
Approach			159	33.4	159	33.4	0.141	7.7	LOS A	0.8	7.4	0.27	0.53
All Vehicles			457	23.5	457	23.5	0.141	6.2	LOS A	0.8	7.4	0.31	0.49

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY



Site: [3 (5)] I-3_Stirling Crescent/Adelaide Street (S1: BG 2041 - PM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh.]	[Dist]				km/h
South: Stirling Crescent (S)															
1	L2	All MCs	114	13.3	114	13.3	0.156	4.6	LOS A	0.9	7.4	0.31	0.46	0.31	50.8
2	T1	All MCs	63	13.3	63	13.3	0.156	4.8	LOS A	0.9	7.4	0.31	0.46	0.31	52.7
3	R2	All MCs	9	13.3	9	13.3	0.156	9.5	LOS A	0.9	7.4	0.31	0.46	0.31	50.0
Approach			186	13.3	186	13.3	0.156	4.9	LOS A	0.9	7.4	0.31	0.46	0.31	51.5
East: Adelaide Street (E)															
4	L2	All MCs	9	33.4	9	33.4	0.092	5.8	LOS A	0.5	4.4	0.43	0.51	0.43	49.0
5	T1	All MCs	66	33.4	66	33.4	0.092	5.9	LOS A	0.5	4.4	0.43	0.51	0.43	49.7
6	R2	All MCs	9	33.4	9	33.4	0.092	10.7	LOS B	0.5	4.4	0.43	0.51	0.43	49.7
Approach			85	33.4	85	33.4	0.092	6.4	LOS A	0.5	4.4	0.43	0.51	0.43	49.6
North: Stirling Crescent (N)															
7	L2	All MCs	9	13.3	9	13.3	0.080	5.3	LOS A	0.4	3.4	0.43	0.51	0.43	51.2
8	T1	All MCs	63	13.3	63	13.3	0.080	5.5	LOS A	0.4	3.4	0.43	0.51	0.43	51.7
9	R2	All MCs	9	13.3	9	13.3	0.080	10.2	LOS B	0.4	3.4	0.43	0.51	0.43	50.5
Approach			82	13.3	82	13.3	0.080	6.1	LOS A	0.4	3.4	0.43	0.51	0.43	51.5
West: Adelaide Street (W)															
10	L2	All MCs	9	33.4	9	33.4	0.171	4.9	LOS A	1.0	9.2	0.30	0.53	0.30	49.7
11	T1	All MCs	66	33.4	66	33.4	0.171	5.0	LOS A	1.0	9.2	0.30	0.53	0.30	48.7
12	R2	All MCs	114	33.4	114	33.4	0.171	9.8	LOS A	1.0	9.2	0.30	0.53	0.30	47.0
Approach			189	33.4	189	33.4	0.171	7.8	LOS A	1.0	9.2	0.30	0.53	0.30	47.7
All Vehicles			543	23.5	543	23.5	0.171	6.4	LOS A	1.0	9.2	0.34	0.50	0.34	49.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▼ Site: [2105 (8)] I-4_Stirling Crescent/Site Access 2 (S1: BG 2041 - AM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

NA
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance													
Mov ID	Turn	Mov Class	Demand Flows	Arrival Flows	Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Cycles Rate to Depart	Number of Cycles	Aver. Speed
			[Total HV] veh/h	[Total HV] veh/h				[Veh. veh	Dist] m				km/h
South: Stirling Crescent (S)													
21	L2	All MCs	1 10.0	1 10.0	0.090	5.7	LOS A	0.0	0.0	0.00	0.00	0.00	53.8
22	T1	All MCs	156 13.3	156 13.3	0.090	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			157 13.3	157 13.3	0.090	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
North: Stirling Crescent (N)													
28	T1	All MCs	156 13.3	156 13.3	0.090	0.0	LOS A	0.0	0.1	0.00	0.00	0.00	59.9
29	R2	All MCs	1 10.0	1 10.0	0.090	5.7	LOS A	0.0	0.1	0.00	0.00	0.00	50.9
Approach			157 13.3	157 13.3	0.090	0.0	NA	0.0	0.1	0.00	0.00	0.00	59.9
West: Site Access 2 (W)													
30	L2	All MCs	1 10.0	1 10.0	0.002	5.2	LOS A	0.0	0.1	0.30	0.51	0.30	44.9
32	R2	All MCs	1 10.0	1 10.0	0.002	6.0	LOS A	0.0	0.1	0.30	0.51	0.30	45.4
Approach			2 10.0	2 10.0	0.002	5.6	LOS A	0.0	0.1	0.30	0.51	0.30	45.1
All Vehicles			316 13.3	316 13.3	0.090	0.1	NA	0.0	0.1	0.00	0.01	0.00	59.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▼ Site: [2105 (9)] I-4_Stirling Crescent/Site Access 2 (S1: BG 2041 - PM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

NA
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance														
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %	Arrival Flows [Total HV] veh/h %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. Dist] veh m		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h	
South: Stirling Crescent (S)														
21	L2	All MCs	1 10.0	1 10.0	0.108	5.7	LOS A	0.0	0.0	0.00	0.00	0.00	53.8	
22	T1	All MCs	186 13.3	186 13.3	0.108	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9	
Approach			187 13.3	187 13.3	0.108	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9	
North: Stirling Crescent (N)														
28	T1	All MCs	186 13.3	186 13.3	0.108	0.0	LOS A	0.0	0.1	0.00	0.00	0.00	59.9	
29	R2	All MCs	1 10.0	1 10.0	0.108	5.7	LOS A	0.0	0.1	0.00	0.00	0.00	50.9	
Approach			187 13.3	187 13.3	0.108	0.0	NA	0.0	0.1	0.00	0.00	0.00	59.9	
West: Site Access 2 (W)														
30	L2	All MCs	1 10.0	1 10.0	0.002	5.3	LOS A	0.0	0.1	0.33	0.51	0.33	44.8	
32	R2	All MCs	1 10.0	1 10.0	0.002	6.3	LOS A	0.0	0.1	0.33	0.51	0.33	45.3	
Approach			2 10.0	2 10.0	0.002	5.8	LOS A	0.0	0.1	0.33	0.51	0.33	45.1	
All Vehicles			377 13.3	377 13.3	0.108	0.1	NA	0.0	0.1	0.00	0.01	0.00	59.7	

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akcelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▼ Site: [3103 (12)] I-5_Stirling Crescent/Kalamunda Road (S1:
BG 2041 - AM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

NA
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh. veh	Dist] m				km/h
			veh/h	%	veh/h	%	v/c	sec							
East: Kalamunda Road (E)															
28	T1	All MCs	873	7.6	873	7.6	0.489	0.5	LOS A	0.0	0.0	0.00	0.00	0.00	59.6
29	R2	All MCs	78	7.6	78	7.6	0.065	7.1	LOS A	0.3	2.2	0.43	0.62	0.43	49.2
Approach			951	7.6	951	7.6	0.489	1.1	NA	0.3	2.2	0.04	0.05	0.04	58.2
North: Stirling Crescent (N)															
30	L2	All MCs	78	13.3	78	13.3	0.067	6.9	LOS A	0.3	2.2	0.36	0.60	0.36	47.7
32	R2	All MCs	78	13.3	78	13.3	0.760	71.4	LOS F	2.8	23.4	0.97	1.20	1.78	20.0
Approach			156	13.3	156	13.3	0.760	39.1	LOS E	2.8	23.4	0.67	0.90	1.07	30.9
West: Kalamunda Road (W)															
21	L2	All MCs	78	7.6	78	7.6	0.179	5.7	LOS A	0.0	0.0	0.00	0.13	0.00	50.9
22	T1	All MCs	271	7.6	271	7.6	0.179	0.0	LOS A	0.0	0.0	0.00	0.13	0.00	58.1
Approach			348	7.6	348	7.6	0.179	1.3	NA	0.0	0.0	0.00	0.13	0.00	56.4
All Vehicles			1455	8.2	1455	8.2	0.760	5.2	NA	2.8	23.4	0.09	0.16	0.14	52.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▼ Site: [3103 (18)] I-5_Stirling Crescent/Kalamunda Road (S1:
BG 2041 - PM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

NA
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand		Arrival		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Rate	Number of Cycles to Depart	Aver. Speed
			Flows		Flows					[Veh. Dist]					
			[Total HV] veh/h	%	[Total HV] veh/h	%				veh	m				
East: Kalamunda Road (E)															
28	T1	All MCs	515	7.6	515	7.6	0.289	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
29	R2	All MCs	94	7.6	94	7.6	0.224	14.8	LOS B	0.8	6.4	0.79	0.93	0.85	44.6
Approach			608	7.6	608	7.6	0.289	2.5	NA	0.8	6.4	0.12	0.14	0.13	55.8
North: Stirling Crescent (N)															
30	L2	All MCs	94	13.3	94	13.3	0.209	16.5	LOS C	0.7	5.9	0.74	0.90	0.78	44.0
32	R2	All MCs	94	13.3	94	13.3	1.771	791.0	LOS F	27.9	233.1	1.00	2.92	8.79	4.5
Approach			187	13.3	187	13.3	1.771	403.7	LOS F	27.9	233.1	0.87	1.91	4.79	9.8
West: Kalamunda Road (W)															
21	L2	All MCs	94	7.6	94	7.6	0.485	5.7	LOS A	0.0	0.0	0.00	0.06	0.00	51.5
22	T1	All MCs	857	7.6	857	7.6	0.485	0.1	LOS A	0.0	0.0	0.00	0.06	0.00	58.8
Approach			951	7.6	951	7.6	0.485	0.6	NA	0.0	0.0	0.00	0.06	0.00	58.1
All Vehicles			1746	8.2	1746	8.2	1.771	44.5	NA	27.9	233.1	0.14	0.29	0.56	35.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akcelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▼ Site: [3104 (8)] I-6_Kalamunda Road/Site Access 3 (S1: BG
2041 - AM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

NA
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh	Dist] m				km/h
East: Kalamunda Road (E)															
28	T1	All MCs	951	7.6	951	7.6	0.520	0.0	LOS A	0.0	0.1	0.00	0.00	0.00	60.0
29	R2	All MCs	1	10.0	1	10.0	0.520	5.7	LOS A	0.0	0.1	0.00	0.00	0.00	46.3
Approach			952	7.6	952	7.6	0.520	0.0	NA	0.0	0.1	0.00	0.00	0.00	60.0
North: Site Access 3 (N)															
30	L2	All MCs	1	10.0	1	10.0	0.003	6.0	LOS A	0.0	0.1	0.49	0.58	0.49	38.4
32	R2	All MCs	1	10.0	1	10.0	0.003	9.5	LOS A	0.0	0.1	0.49	0.58	0.49	42.0
Approach			2	10.0	2	10.0	0.003	7.7	LOS A	0.0	0.1	0.49	0.58	0.49	40.5
West: Kalamunda Road (W)															
21	L2	All MCs	1	10.0	1	10.0	0.191	5.7	LOS A	0.0	0.0	0.00	0.00	0.00	53.4
22	T1	All MCs	348	7.6	348	7.6	0.191	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			349	7.6	349	7.6	0.191	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
All Vehicles			1303	7.6	1303	7.6	0.520	0.0	NA	0.0	0.1	0.00	0.00	0.00	59.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▼ Site: [3104 (9)] I-6_Kalamunda Road/Site Access 3 (S1: BG
2041 - PM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

NA
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Cycles	Number of Cycles	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh.]	[Dist]		Rate to Depart		
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
East: Kalamunda Road (E)															
28	T1	All MCs	608	7.6	608	7.6	0.334	0.0	LOS A	0.0	0.2	0.00	0.00	0.00	59.9
29	R2	All MCs	1	10.0	1	10.0	0.334	7.0	LOS A	0.0	0.2	0.00	0.00	0.00	46.2
Approach			609	7.6	609	7.6	0.334	0.0	NA	0.0	0.2	0.00	0.00	0.00	59.9
North: Site Access 3 (N)															
30	L2	All MCs	1	10.0	1	10.0	0.006	12.7	LOS B	0.0	0.1	0.74	0.81	0.74	34.6
32	R2	All MCs	1	10.0	1	10.0	0.006	12.0	LOS B	0.0	0.1	0.74	0.81	0.74	39.0
Approach			2	10.0	2	10.0	0.006	12.3	LOS B	0.0	0.1	0.74	0.81	0.74	37.1
West: Kalamunda Road (W)															
21	L2	All MCs	1	10.0	1	10.0	0.519	5.8	LOS A	0.0	0.0	0.00	0.00	0.00	53.2
22	T1	All MCs	949	7.6	949	7.6	0.519	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	59.5
Approach			951	7.6	951	7.6	0.519	0.2	NA	0.0	0.0	0.00	0.00	0.00	59.5
All Vehicles			1562	7.6	1562	7.6	0.519	0.1	NA	0.0	0.2	0.00	0.00	0.00	59.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akcelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 **Site: [1 (3)] I-7_Kalamunda Road/Abernethy Road (S1: BG 2041 - AM Peak)**
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 122.0 seconds (Site User-Given Cycle Time)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Cycles	Number of Cycles	Aver. Speed
			[Total HV]		[Total HV]					[Veh.	Dist]		Rate to Depart		
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Abernethy Road (S)															
1	L2	All MCs	118	33.4	118	33.4	0.711	38.4	LOS D	15.1	136.1	0.97	0.86	1.01	31.8
2	T1	All MCs	411	33.4	411	33.4	0.711	52.5	LOS D	15.1	136.1	0.98	0.86	1.01	33.3
3	R2	All MCs	62	33.4	62	33.4	* 0.811	77.3	LOS E	4.2	37.4	1.00	0.91	1.34	24.4
Approach			591	33.4	591	33.4	0.811	52.3	LOS D	15.1	136.1	0.98	0.86	1.04	31.9
East: Kalamunda Road (E)															
4	L2	All MCs	211	7.6	211	7.6	0.489	31.3	LOS C	15.5	115.4	0.80	0.77	0.80	36.2
5	T1	All MCs	656	7.6	656	7.6	* 0.811	52.9	LOS D	29.2	218.0	0.93	0.88	0.98	35.2
6	R2	All MCs	84	7.6	84	7.6	0.298	71.8	LOS E	4.5	33.6	0.92	0.77	0.92	29.4
Approach			951	7.6	951	7.6	0.811	49.8	LOS D	29.2	218.0	0.90	0.84	0.94	31.4
North: Abernethy Road (N)															
7	L2	All MCs	36	33.4	36	33.4	0.035	7.1	LOS A	0.3	2.3	0.16	0.72	0.16	45.1
8	T1	All MCs	593	33.4	593	33.4	* 0.811	53.9	LOS D	18.2	163.6	1.00	0.96	1.13	31.9
9	R2	All MCs	21	33.4	21	33.4	0.275	70.9	LOS E	1.3	11.7	0.99	0.71	0.99	27.1
Approach			649	33.4	649	33.4	0.811	51.9	LOS D	18.2	163.6	0.95	0.94	1.07	32.2
West: Kalamunda Road (W)															
10	L2	All MCs	32	7.6	32	7.6	0.180	26.5	LOS C	4.9	36.6	0.71	0.62	0.71	39.6
11	T1	All MCs	283	7.6	283	7.6	0.275	29.1	LOS C	7.9	58.8	0.73	0.62	0.73	39.5
12	R2	All MCs	229	7.6	229	7.6	* 0.811	64.9	LOS E	14.3	106.9	1.00	0.92	1.16	28.5
Approach			544	7.6	544	7.6	0.811	44.1	LOS D	14.3	106.9	0.84	0.75	0.91	33.8
All Vehicles			2735	19.3	2735	19.3	0.811	49.7	LOS D	29.2	218.0	0.92	0.85	0.99	32.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

 **Site: [1 (6)] I-7_Kalamunda Road/Abernethy Road (S1: BG 2041 - PM Peak)**
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 111.0 seconds (Site User-Given Cycle Time)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Cycles	Number of Cycles	Aver. Speed
			[Total HV]		[Total HV]										
			veh/h	%	veh/h	%	v/c	sec		[Veh. veh	[Dist] m		Rate to Depart		km/h
South: Abernethy Road (S)															
1	L2	All MCs	432	33.4	432	33.4	* 1.130	174.5	LOS F	70.5	635.2	1.00	1.60	2.15	15.6
2	T1	All MCs	815	33.4	815	33.4	1.130	186.5	LOS F	70.5	635.2	1.00	1.81	2.17	16.0
3	R2	All MCs	246	33.4	246	33.4	* 1.132	203.2	LOS F	25.9	233.2	1.00	1.46	2.29	13.8
Approach			1493	33.4	1493	33.4	1.132	185.8	LOS F	70.5	635.2	1.00	1.69	2.18	15.1
East: Kalamunda Road (E)															
4	L2	All MCs	91	7.6	91	7.6	0.576	34.4	LOS C	11.1	82.8	0.95	0.80	0.95	32.1
5	T1	All MCs	487	7.6	487	7.6	0.956	75.6	LOS E	24.6	183.4	0.99	1.09	1.31	27.6
6	R2	All MCs	31	7.6	31	7.6	0.245	72.0	LOS E	1.7	12.3	0.98	0.72	0.98	28.0
Approach			608	7.6	608	7.6	0.956	69.3	LOS E	24.6	183.4	0.98	1.03	1.24	26.6
North: Abernethy Road (N)															
7	L2	All MCs	76	33.4	76	33.4	0.101	13.2	LOS B	1.3	11.6	0.53	1.27	0.53	28.1
8	T1	All MCs	466	33.4	466	33.4	0.421	30.3	LOS C	9.7	87.7	0.82	0.69	0.82	40.2
9	R2	All MCs	34	33.4	34	33.4	0.155	52.3	LOS D	1.6	14.8	0.91	0.73	0.91	31.5
Approach			576	33.4	576	33.4	0.421	29.3	LOS C	9.7	87.7	0.78	0.77	0.78	37.6
West: Kalamunda Road (W)															
10	L2	All MCs	18	7.6	18	7.6	0.739	33.0	LOS C	14.9	110.8	1.00	0.88	1.06	32.9
11	T1	All MCs	666	7.6	666	7.6	* 1.132	137.3	LOS F	42.4	316.1	1.00	1.38	1.76	18.6
12	R2	All MCs	141	7.6	141	7.6	1.131	204.6	LOS F	14.6	108.8	1.00	1.39	2.34	15.0
Approach			825	7.6	825	7.6	1.132	146.5	LOS F	42.4	316.1	1.00	1.37	1.85	17.3
All Vehicles			3502	22.8	3502	22.8	1.132	130.6	LOS F	70.5	635.2	0.96	1.35	1.71	18.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

 **Site: [2 (2)] I-1 Adelaide St/Abernethy Rd (S2: BG 2041+Dev - AM Peak)**

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Cycles	Number of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh.]	Dist]		Rate to Depart		km/h
South: Abernethy Road (S)															
1	L2	All MCs	32	33.4	32	33.4	0.045	6.5	LOS A	0.2	2.0	0.47	0.58	0.47	46.8
2	T1	All MCs	389	33.4	389	33.4	0.566	6.4	LOS A	4.9	43.9	0.66	0.59	0.66	49.0
3	R2	All MCs	240	33.4	240	33.4	0.566	11.1	LOS B	4.9	43.9	0.66	0.59	0.66	48.1
Approach			661	33.4	661	33.4	0.566	8.1	LOS A	4.9	43.9	0.65	0.59	0.65	48.6
East: Adelaide Road (E)															
4	L2	All MCs	139	33.4	139	33.4	0.263	10.9	LOS B	1.5	13.8	0.78	0.75	0.78	48.1
5	T1	All MCs	25	33.4	25	33.4	0.275	9.3	LOS A	1.7	15.3	0.78	0.76	0.78	40.5
6	R2	All MCs	144	33.4	144	33.4	0.275	14.5	LOS B	1.7	15.3	0.78	0.76	0.78	39.8
Approach			308	33.4	308	33.4	0.275	12.4	LOS B	1.7	15.3	0.78	0.75	0.78	43.7
North: Abernethy Road (N)															
7	L2	All MCs	241	33.4	241	33.4	0.329	7.9	LOS A	2.0	17.6	0.64	0.65	0.64	47.0
8	T1	All MCs	514	33.4	514	33.4	0.555	7.8	LOS A	4.7	42.3	0.73	0.65	0.78	48.9
9	R2	All MCs	36	33.4	36	33.4	0.555	12.5	LOS B	4.7	42.3	0.73	0.65	0.78	40.8
Approach			791	33.4	791	33.4	0.555	8.1	LOS A	4.7	42.3	0.70	0.65	0.74	48.1
West: Brinsmead Road (W)															
10	L2	All MCs	36	42.7	36	42.7	0.259	12.5	LOS B	1.4	13.3	0.80	0.81	0.80	40.5
11	T1	All MCs	38	42.7	38	42.7	0.259	12.6	LOS B	1.4	13.3	0.80	0.81	0.80	42.1
12	R2	All MCs	32	42.7	32	42.7	0.259	17.5	LOS B	1.4	13.3	0.80	0.81	0.80	43.3
Approach			105	42.7	105	42.7	0.259	14.0	LOS B	1.4	13.3	0.80	0.81	0.80	42.0
All Vehicles			1865	33.9	1865	33.9	0.566	9.1	LOS A	4.9	43.9	0.70	0.65	0.72	47.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 **Site: [2 (3)] I-1 Adelaide St/Abernethy Rd (S2: BG 2041+Dev - PM Peak)**

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance													
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %	Arrival Flows [Total HV] veh/h %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh Dist] veh m		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Abernethy Road (S)													
1	L2	All MCs	18 33.4	18 33.4	0.302	8.8	LOS A	1.7	15.7	0.67	0.65	0.67	45.3
2	T1	All MCs	719 33.4	719 33.4	0.753	11.6	LOS B	10.3	92.7	0.87	0.81	1.08	46.4
3	R2	All MCs	160 33.4	160 33.4	0.753	16.3	LOS B	10.3	92.7	0.93	0.85	1.20	44.9
Approach			897 33.4	897 33.4	0.753	12.4	LOS B	10.3	92.7	0.88	0.81	1.09	46.1
East: Adelaide Road (E)													
4	L2	All MCs	261 33.4	261 33.4	0.414	10.3	LOS B	2.6	23.8	0.77	0.74	0.81	48.3
5	T1	All MCs	42 33.4	42 33.4	0.424	9.0	LOS A	2.8	25.4	0.77	0.75	0.80	40.7
6	R2	All MCs	261 33.4	261 33.4	0.424	13.9	LOS B	2.8	25.4	0.77	0.75	0.80	39.9
Approach			564 33.4	564 33.4	0.424	11.9	LOS B	2.8	25.4	0.77	0.75	0.80	43.9
North: Abernethy Road (N)													
7	L2	All MCs	157 33.4	157 33.4	0.207	6.8	LOS A	1.2	10.5	0.52	0.59	0.52	48.1
8	T1	All MCs	433 33.4	433 33.4	0.426	6.2	LOS A	3.2	28.5	0.58	0.53	0.58	50.0
9	R2	All MCs	32 33.4	32 33.4	0.426	10.8	LOS B	3.2	28.5	0.58	0.53	0.58	41.9
Approach			621 33.4	621 33.4	0.426	6.6	LOS A	3.2	28.5	0.57	0.55	0.57	49.2
West: Brinsmead Road (W)													
10	L2	All MCs	32 42.7	32 42.7	0.257	16.2	LOS B	1.2	11.8	0.83	0.89	0.83	39.5
11	T1	All MCs	29 42.7	29 42.7	0.257	14.1	LOS B	1.2	11.8	0.83	0.89	0.83	41.2
12	R2	All MCs	18 42.7	18 42.7	0.257	19.1	LOS B	1.2	11.8	0.83	0.89	0.83	42.5
Approach			79 42.7	79 42.7	0.257	16.1	LOS B	1.2	11.8	0.83	0.89	0.83	40.9
All Vehicles			2161 33.7	2161 33.7	0.753	10.7	LOS B	10.3	92.7	0.76	0.72	0.86	46.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 **Site: [3102 (7)] I-2_Adelaide St/Site Access 1 - Peak Court**

(S2: BG 2041+Dev - AM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

NA

Site Category: (None)

Stop (Two-Way)

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Cycles Rate to Depart	Aver. Number of Cycles	Aver. Speed
			[Total HV]	[Total HV]											
			veh/h	%	veh/h	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Site Access 1 (S) - Peak Court															
30	L2	All MCs	67	10.0	67	10.0	0.057	6.7	LOS A	0.2	1.8	0.36	0.59	0.36	47.4
32	R2	All MCs	17	10.0	17	10.0	0.040	12.0	LOS B	0.1	0.9	0.65	0.85	0.65	44.0
Approach			84	10.0	84	10.0	0.057	7.8	LOS A	0.2	1.8	0.42	0.65	0.42	46.7
East: Adelaide Street (E)															
21	L2	All MCs	67	10.0	67	10.0	0.203	5.3	LOS A	0.0	0.0	0.00	0.12	0.00	47.0
22	T1	All MCs	241	33.4	241	33.4	0.203	0.1	LOS A	0.0	0.0	0.00	0.12	0.00	48.7
Approach			308	28.3	308	28.3	0.203	1.2	NA	0.0	0.0	0.00	0.12	0.00	48.3
West: Adelaide Street (W)															
28	T1	All MCs	249	33.4	249	33.4	0.384	1.6	LOS A	2.3	20.5	0.46	0.53	0.50	45.8
29	R2	All MCs	269	10.0	269	10.0	0.384	6.8	LOS A	2.3	20.5	0.46	0.53	0.50	45.9
Approach			519	21.2	519	21.2	0.384	4.3	NA	2.3	20.5	0.46	0.53	0.50	45.9
All Vehicles			912	22.6	912	22.6	0.384	3.6	NA	2.3	20.5	0.30	0.40	0.32	46.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akcelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: C:\Users\SebastianCano\OneDrive - Protest Engineering\Desktop\WORK\Projects\PTG02687 - TIA - Hatch Court Light Industrial Area
LSP\20260707 SIDRA Update\PTG.02687_Hatch Court Light Industrial Area Sidra_sc_2026-07-07.sipx

MOVEMENT SUMMARY

 **Site: [3102 (8)] I-2_Adelaide St/Site Access 1 - Peak Court**

(S2: BG 2041+Dev - PM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

NA

Site Category: (None)

Stop (Two-Way)

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Cycles	Number of Cycles	Aver. Speed
			[Total HV]	[Total HV]											
			veh/h	%	veh/h	%	v/c	sec		[Veh. veh	[Dist] m		Rate to Depart		km/h
South: Site Access 1 (S) - Peak Court															
30	L2	All MCs	269	10.0	269	10.0	0.244	7.3	LOS A	1.1	8.7	0.45	0.66	0.45	47.1
32	R2	All MCs	67	10.0	67	10.0	0.125	10.4	LOS B	0.4	3.2	0.58	0.82	0.58	45.0
Approach			337	10.0	337	10.0	0.244	8.0	LOS A	1.1	8.7	0.48	0.69	0.48	46.7
East: Adelaide Street (E)															
21	L2	All MCs	17	10.0	17	10.0	0.209	4.8	LOS A	0.0	0.0	0.00	0.03	0.00	47.6
22	T1	All MCs	295	33.4	295	33.4	0.209	0.1	LOS A	0.0	0.0	0.00	0.03	0.00	49.6
Approach			312	32.1	312	32.1	0.209	0.3	NA	0.0	0.0	0.00	0.03	0.00	49.4
West: Adelaide Street (W)															
28	T1	All MCs	279	33.4	279	33.4	0.241	0.5	LOS A	0.6	5.7	0.20	0.24	0.20	48.1
29	R2	All MCs	67	10.0	67	10.0	0.241	6.4	LOS A	0.6	5.7	0.20	0.24	0.20	47.8
Approach			346	28.8	346	28.8	0.241	1.7	NA	0.6	5.7	0.20	0.24	0.20	48.1
All Vehicles			995	23.5	995	23.5	0.244	3.4	NA	1.1	8.7	0.23	0.33	0.23	47.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akcelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: C:\Users\SebastianCano\OneDrive - Protest Engineering\Desktop\WORK\Projects\PTG02687 - TIA - Hatch Court Light Industrial Area
LSP\20260707 SIDRA Update\PTG.02687_Hatch Court Light Industrial Area Sidra_sc_2026-07-07.sipx

MOVEMENT SUMMARY

 **Site: [3 (2)] I-3_Stirling Crescent/Adelaide Street (S2: BG 2041+Dev - AM Peak)**
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Cycles	Number of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh.]	[Dist]		Rate to Depart		km/h
South: Stirling Crescent (S)															
1	L2	All MCs	193	13.3	193	13.3	0.204	4.5	LOS A	1.3	10.3	0.30	0.46	0.30	51.0
2	T1	All MCs	53	13.3	53	13.3	0.204	4.7	LOS A	1.3	10.3	0.30	0.46	0.30	52.9
3	R2	All MCs	8	13.3	8	13.3	0.204	9.4	LOS A	1.3	10.3	0.30	0.46	0.30	50.2
Approach			254	13.3	254	13.3	0.204	4.7	LOS A	1.3	10.3	0.30	0.46	0.30	51.4
East: Adelaide Street (E)															
4	L2	All MCs	8	33.4	8	33.4	0.081	6.0	LOS A	0.4	3.8	0.46	0.53	0.46	48.8
5	T1	All MCs	56	33.4	56	33.4	0.081	6.1	LOS A	0.4	3.8	0.46	0.53	0.46	49.5
6	R2	All MCs	8	33.4	8	33.4	0.081	10.9	LOS B	0.4	3.8	0.46	0.53	0.46	49.5
Approach			73	33.4	73	33.4	0.081	6.7	LOS A	0.4	3.8	0.46	0.53	0.46	49.4
North: Stirling Crescent (N)															
7	L2	All MCs	8	13.3	8	13.3	0.070	5.5	LOS A	0.4	2.9	0.45	0.52	0.45	51.1
8	T1	All MCs	53	13.3	53	13.3	0.070	5.7	LOS A	0.4	2.9	0.45	0.52	0.45	51.6
9	R2	All MCs	8	13.3	8	13.3	0.070	10.4	LOS B	0.4	2.9	0.45	0.52	0.45	50.4
Approach			69	13.3	69	13.3	0.070	6.3	LOS A	0.4	2.9	0.45	0.52	0.45	51.4
West: Adelaide Street (W)															
10	L2	All MCs	8	33.4	8	33.4	0.188	4.7	LOS A	1.1	10.3	0.28	0.55	0.28	49.4
11	T1	All MCs	56	33.4	56	33.4	0.188	4.9	LOS A	1.1	10.3	0.28	0.55	0.28	48.4
12	R2	All MCs	151	33.4	151	33.4	0.188	9.6	LOS A	1.1	10.3	0.28	0.55	0.28	46.8
Approach			215	33.4	215	33.4	0.188	8.2	LOS A	1.1	10.3	0.28	0.55	0.28	47.3
All Vehicles			611	22.8	611	22.8	0.204	6.4	LOS A	1.3	10.3	0.33	0.50	0.33	49.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 **Site: [3 (3)] I-3_Stirling Crescent/Adelaide Street (S2: BG 2041+Dev - PM Peak)**
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Cycles	Number of Cycles to Depart	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Stirling Crescent (S)															
1	L2	All MCs	173	13.3	173	13.3	0.203	4.6	LOS A	1.3	10.3	0.33	0.46	0.33	50.8
2	T1	All MCs	63	13.3	63	13.3	0.203	4.8	LOS A	1.3	10.3	0.33	0.46	0.33	52.7
3	R2	All MCs	9	13.3	9	13.3	0.203	9.5	LOS A	1.3	10.3	0.33	0.46	0.33	50.0
Approach			245	13.3	245	13.3	0.203	4.9	LOS A	1.3	10.3	0.33	0.46	0.33	51.3
East: Adelaide Street (E)															
4	L2	All MCs	9	33.4	9	33.4	0.103	6.6	LOS A	0.6	5.0	0.53	0.56	0.53	48.4
5	T1	All MCs	66	33.4	66	33.4	0.103	6.8	LOS A	0.6	5.0	0.53	0.56	0.53	49.1
6	R2	All MCs	9	33.4	9	33.4	0.103	11.5	LOS B	0.6	5.0	0.53	0.56	0.53	49.2
Approach			85	33.4	85	33.4	0.103	7.3	LOS A	0.6	5.0	0.53	0.56	0.53	49.0
North: Stirling Crescent (N)															
7	L2	All MCs	9	13.3	9	13.3	0.089	6.1	LOS A	0.5	3.8	0.52	0.56	0.52	50.8
8	T1	All MCs	63	13.3	63	13.3	0.089	6.3	LOS A	0.5	3.8	0.52	0.56	0.52	51.2
9	R2	All MCs	9	13.3	9	13.3	0.089	10.9	LOS B	0.5	3.8	0.52	0.56	0.52	50.1
Approach			82	13.3	82	13.3	0.089	6.8	LOS A	0.5	3.8	0.52	0.56	0.52	51.0
West: Adelaide Street (W)															
10	L2	All MCs	9	33.4	9	33.4	0.251	4.9	LOS A	1.6	14.6	0.32	0.55	0.32	49.2
11	T1	All MCs	66	33.4	66	33.4	0.251	5.1	LOS A	1.6	14.6	0.32	0.55	0.32	48.1
12	R2	All MCs	207	33.4	207	33.4	0.251	9.8	LOS A	1.6	14.6	0.32	0.55	0.32	46.5
Approach			283	33.4	283	33.4	0.251	8.5	LOS A	1.6	14.6	0.32	0.55	0.32	47.0
All Vehicles			696	23.9	696	23.9	0.251	6.9	LOS A	1.6	14.6	0.37	0.52	0.37	49.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [2105 (6)] I-4_Stirling Crescent/Site Access 2 (S2: BG 2041+Dev - AM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

NA
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Cycles	Number of Depart	Aver. Speed
			[Total HV]	[Total HV]						[Veh.	Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Stirling Crescent (S)															
21	L2	All MCs	11	10.0	11	10.0	0.135	5.7	LOS A	0.0	0.0	0.00	0.03	0.00	53.6
22	T1	All MCs	223	13.3	223	13.3	0.135	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	59.6
Approach			234	13.2	234	13.2	0.135	0.3	NA	0.0	0.0	0.00	0.03	0.00	59.3
North: Stirling Crescent (N)															
28	T1	All MCs	127	13.3	127	13.3	0.097	0.3	LOS A	0.2	2.0	0.16	0.20	0.16	57.9
29	R2	All MCs	32	10.0	32	10.0	0.097	6.6	LOS A	0.2	2.0	0.16	0.20	0.16	49.5
Approach			159	12.6	159	12.6	0.097	1.5	NA	0.2	2.0	0.16	0.20	0.16	55.9
West: Site Access 2 (W)															
30	L2	All MCs	8	10.0	8	10.0	0.011	5.5	LOS A	0.0	0.3	0.34	0.53	0.34	44.8
32	R2	All MCs	3	10.0	3	10.0	0.011	6.5	LOS A	0.0	0.3	0.34	0.53	0.34	45.3
Approach			12	10.0	12	10.0	0.011	5.8	LOS A	0.0	0.3	0.34	0.53	0.34	44.9
All Vehicles			404	12.9	404	12.9	0.135	0.9	NA	0.2	2.0	0.07	0.11	0.07	57.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akcelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▼ Site: [2105 (7)] I-4_Stirling Crescent/Site Access 2 (S2: BG 2041+Dev - PM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

NA
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance													
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h	Arrival Flows [Total HV] veh/h	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. Dist] veh m		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Stirling Crescent (S)													
21	L2	All MCs	3 10.0	3 10.0	0.119	5.7	LOS A	0.0	0.0	0.00	0.01	0.00	53.7
22	T1	All MCs	203 13.3	203 13.3	0.119	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.8
Approach			206 13.2	206 13.2	0.119	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.7
North: Stirling Crescent (N)													
28	T1	All MCs	254 13.3	254 13.3	0.152	0.0	LOS A	0.1	0.6	0.03	0.03	0.03	59.6
29	R2	All MCs	8 10.0	8 10.0	0.152	6.2	LOS A	0.1	0.6	0.03	0.03	0.03	50.7
Approach			262 13.2	262 13.2	0.152	0.2	NA	0.1	0.6	0.03	0.03	0.03	59.3
West: Site Access 2 (W)													
30	L2	All MCs	32 10.0	32 10.0	0.039	5.4	LOS A	0.1	1.1	0.34	0.55	0.34	44.7
32	R2	All MCs	11 10.0	11 10.0	0.039	7.1	LOS A	0.1	1.1	0.34	0.55	0.34	45.3
Approach			42 10.0	42 10.0	0.039	5.9	LOS A	0.1	1.1	0.34	0.55	0.34	44.9
All Vehicles			511 13.0	511 13.0	0.152	0.6	NA	0.1	1.1	0.04	0.06	0.04	57.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akcelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [3103 (9)] I-5_Stirling Crescent/Kalamunda Road (S2:
BG 2041+Dev - AM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

NA
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]						[Veh.]	Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
East: Kalamunda Road (E)															
28	T1	All MCs	1011	7.6	1011	7.6	0.566	0.4	LOS A	0.0	0.0	0.00	0.00	0.00	59.4
29	R2	All MCs	96	7.6	96	7.6	0.317	20.0	LOS C	1.1	8.9	0.86	0.99	1.03	41.8
Approach			1106	7.6	1106	7.6	0.566	2.1	NA	1.1	8.9	0.07	0.09	0.09	56.6
North: Stirling Crescent (N)															
30	L2	All MCs	89	13.3	89	13.3	0.254	103.6	LOS F	0.8	7.1	0.80	0.95	0.91	42.4
32	R2	All MCs	107	13.3	107	13.3	7.985	6535.4	LOS F	60.7	508.3	1.00	1.83	4.70	2.4
Approach			197	13.3	197	13.3	7.985	3611.8	LOS F	60.7	508.3	0.91	1.43	2.97	4.4
West: Kalamunda Road (W)															
21	L2	All MCs	115	7.6	115	7.6	0.545	5.7	LOS A	0.0	0.0	0.00	0.06	0.00	51.4
22	T1	All MCs	955	7.6	955	7.6	0.545	0.1	LOS A	0.0	0.0	0.00	0.06	0.00	58.7
Approach			1069	7.6	1069	7.6	0.545	0.7	NA	0.0	0.0	0.00	0.06	0.00	57.8
All Vehicles			2373	8.1	2373	8.1	7.985	300.9	NA	60.7	508.3	0.11	0.19	0.29	26.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akcelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▼ Site: [3103 (15)] I-5_Stirling Crescent/Kalamunda Road (S2:
BG 2041+Dev - PM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

NA
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh	Dist] m				km/h
East: Kalamunda Road (E)															
28	T1	All MCs	534	7.6	534	7.6	0.299	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
29	R2	All MCs	123	7.6	123	7.6	0.400	20.9	LOS C	1.5	11.9	0.87	1.02	1.14	41.3
Approach			657	7.6	657	7.6	0.400	4.1	NA	1.5	11.9	0.16	0.19	0.21	53.8
North: Stirling Crescent (N)															
30	L2	All MCs	138	13.3	138	13.3	0.363	40.1	LOS E	1.4	11.4	0.81	0.99	1.04	42.2
32	R2	All MCs	161	13.3	161	13.3	4.944	3684.2	LOS F	81.8	684.7	1.00	3.38	10.94	2.7
Approach			299	13.3	299	13.3	4.944	2003.3	LOS F	81.8	684.7	0.91	2.27	6.37	5.5
West: Kalamunda Road (W)															
21	L2	All MCs	138	7.6	138	7.6	0.543	5.7	LOS A	0.0	0.0	0.00	0.08	0.00	51.3
22	T1	All MCs	925	7.6	925	7.6	0.543	0.1	LOS A	0.0	0.0	0.00	0.08	0.00	58.5
Approach			1063	7.6	1063	7.6	0.543	0.8	NA	0.0	0.0	0.00	0.08	0.00	57.5
All Vehicles			2019	8.4	2019	8.4	4.944	298.4	NA	81.8	684.7	0.19	0.44	1.01	22.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akcelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 **Site: [3103 (21)] I-5_Stirling Crescent/Kalamunda Road - Conversion (S2: BG 2041+Dev - AM Peak)**
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

NA
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh.]	[Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
East: Kalamunda Road (E)															
28	T1	All MCs	1011	7.6	1011	7.6	0.566	4.5	LOS A	0.0	0.0	0.00	0.36	0.00	53.0
29	R2	All MCs	96	7.6	96	7.6	0.116	10.2	LOS B	0.7	5.3	0.37	0.60	0.37	51.3
Approach			1106	7.6	1106	7.6	0.566	5.0	LOS A	0.7	5.3	0.03	0.38	0.03	52.7
North: Stirling Crescent (N)															
30	L2	All MCs	89	13.3	89	13.3	0.164	12.6	LOS B	0.9	7.7	0.78	0.75	0.78	48.8
32	R2	All MCs	107	13.3	107	13.3	0.156	16.7	LOS B	1.0	8.0	0.78	0.76	0.78	45.4
Approach			197	13.3	197	13.3	0.164	14.8	LOS B	1.0	8.0	0.78	0.76	0.78	47.1
West: Kalamunda Road (W)															
21	L2	All MCs	115	7.6	115	7.6	0.545	3.9	LOS A	0.0	0.0	0.00	0.37	0.00	54.2
22	T1	All MCs	955	7.6	955	7.6	0.545	3.8	LOS A	0.0	0.0	0.00	0.37	0.00	51.0
Approach			1069	7.6	1069	7.6	0.545	3.8	LOS A	0.0	0.0	0.00	0.37	0.00	51.5
All Vehicles			2373	8.1	2373	8.1	0.566	5.3	LOS A	1.0	8.0	0.08	0.41	0.08	51.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 **Site: [3103 (22)] I-5_Stirling Crescent/Kalamunda Road - with improvements - Conversion (S2: BG 2041+Dev - PM Peak)**
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

NA
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]						[Veh.]	[Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
East: Kalamunda Road (E)															
28	T1	All MCs	534	7.6	534	7.6	0.299	4.3	LOS A	0.0	0.0	0.00	0.36	0.00	53.2
29	R2	All MCs	123	7.6	123	7.6	0.161	10.8	LOS B	0.9	7.4	0.46	0.62	0.46	51.1
Approach			657	7.6	657	7.6	0.299	5.5	LOS A	0.9	7.4	0.09	0.41	0.09	52.5
North: Stirling Crescent (N)															
30	L2	All MCs	138	13.3	138	13.3	0.085	3.7	LOS A	0.0	0.0	0.00	0.43	0.00	53.7
32	R2	All MCs	161	13.3	161	13.3	0.228	16.5	LOS B	1.4	11.8	0.79	0.77	0.79	45.5
Approach			299	13.3	299	13.3	0.228	10.6	LOS B	1.4	11.8	0.43	0.61	0.43	49.4
West: Kalamunda Road (W)															
21	L2	All MCs	138	7.6	138	7.6	0.543	3.9	LOS A	0.0	0.0	0.00	0.38	0.00	54.2
22	T1	All MCs	925	7.6	925	7.6	0.543	3.8	LOS A	0.0	0.0	0.00	0.38	0.00	51.0
Approach			1063	7.6	1063	7.6	0.543	3.8	LOS A	0.0	0.0	0.00	0.38	0.00	51.6
All Vehicles			2019	8.4	2019	8.4	0.543	5.4	LOS A	1.4	11.8	0.09	0.42	0.09	51.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▼ Site: [3104 (6)] I-6_Kalamunda Road/Site Access 3 (S2: BG 2041+Dev - AM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

NA
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh	Dist] m				km/h
East: Kalamunda Road (E)															
28	T1	All MCs	1043	7.6	1043	7.6	0.762	12.8	LOS B	11.9	94.4	0.23	0.28	0.98	42.7
29	R2	All MCs	73	10.0	73	10.0	0.762	28.9	LOS D	11.9	94.4	0.23	0.28	0.98	32.9
Approach			1116	7.8	1116	7.8	0.762	13.9	NA	11.9	94.4	0.23	0.28	0.98	42.1
North: Site Access 3 (N)															
30	L2	All MCs	19	10.0	19	10.0	0.288	18.5	LOS C	0.6	5.2	0.90	0.99	1.02	26.1
32	R2	All MCs	24	10.0	24	10.0	0.288	34.4	LOS D	0.6	5.2	0.90	0.99	1.02	31.4
Approach			43	10.0	43	10.0	0.288	27.4	LOS D	0.6	5.2	0.90	0.99	1.02	29.4
West: Kalamunda Road (W)															
21	L2	All MCs	94	10.0	94	10.0	0.628	5.9	LOS A	0.0	0.0	0.00	0.05	0.00	52.5
22	T1	All MCs	1048	7.6	1048	7.6	0.628	0.3	LOS A	0.0	0.0	0.00	0.05	0.00	58.5
Approach			1142	7.8	1142	7.8	0.628	0.8	NA	0.0	0.0	0.00	0.05	0.00	57.9
All Vehicles			2301	7.8	2301	7.8	0.762	7.6	NA	11.9	94.4	0.13	0.18	0.50	48.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akcelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▼ Site: [3104 (7)] I-6_Kalamunda Road/Site Access 3 (S2: BG 2041+Dev - PM Peak)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

NA
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh	Dist] m				km/h
East: Kalamunda Road (E)															
28	T1	All MCs	669	7.6	669	7.6	0.402	0.8	LOS A	0.6	4.9	0.08	0.09	0.10	58.1
29	R2	All MCs	19	10.0	19	10.0	0.402	14.1	LOS B	0.6	4.9	0.08	0.09	0.10	44.8
Approach			688	7.7	688	7.7	0.402	1.1	NA	0.6	4.9	0.08	0.09	0.10	57.7
North: Site Access 3 (N)															
30	L2	All MCs	73	10.0	73	10.0	0.553	19.4	LOS C	1.8	15.0	0.89	1.08	1.33	29.9
32	R2	All MCs	94	10.0	94	10.0	0.553	19.7	LOS C	1.8	15.0	0.89	1.08	1.33	35.0
Approach			166	10.0	166	10.0	0.553	19.5	LOS C	1.8	15.0	0.89	1.08	1.33	33.1
West: Kalamunda Road (W)															
21	L2	All MCs	24	10.0	24	10.0	0.557	5.9	LOS A	0.0	0.0	0.00	0.01	0.00	53.0
22	T1	All MCs	994	7.6	994	7.6	0.557	0.2	LOS A	0.0	0.0	0.00	0.01	0.00	59.2
Approach			1018	7.7	1018	7.7	0.557	0.4	NA	0.0	0.0	0.00	0.01	0.00	59.0
All Vehicles			1873	7.9	1873	7.9	0.557	2.4	NA	1.8	15.0	0.11	0.14	0.16	54.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akcelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 **Site: [1 (5)] I-7_Kalamunda Road/Abernethy Road (S2: BG 2041+Dev - AM Peak)**
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 122.0 seconds (Site User-Given Cycle Time)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Cycles	Number of Cycles	Aver. Speed
			[Total HV]	[Total HV]											
			veh/h	%	veh/h	%	v/c	sec		[Veh. veh	Dist] m		Rate to Depart		km/h
South: Abernethy Road (S)															
1	L2	All MCs	118	33.4	118	33.4	* 0.964	72.0	LOS E	26.2	235.7	1.00	1.21	1.45	24.5
2	T1	All MCs	545	33.4	545	33.4	0.964	85.7	LOS F	26.2	235.7	1.00	1.22	1.45	25.5
3	R2	All MCs	151	33.4	151	33.4	* 0.962	93.1	LOS F	11.5	103.8	1.00	1.11	1.58	21.8
Approach			814	33.4	814	33.4	0.964	85.1	LOS F	26.2	235.7	1.00	1.20	1.47	24.7
East: Kalamunda Road (E)															
4	L2	All MCs	269	7.6	269	7.6	0.580	34.3	LOS C	18.4	137.0	0.86	0.81	0.86	34.7
5	T1	All MCs	663	7.6	663	7.6	* 0.962	86.7	LOS F	42.1	313.6	0.98	1.14	1.27	27.2
6	R2	All MCs	92	7.6	92	7.6	0.385	80.6	LOS F	5.1	38.1	0.96	0.77	0.96	28.5
Approach			1024	7.6	1024	7.6	0.962	72.4	LOS E	42.1	313.6	0.94	1.02	1.13	25.8
North: Abernethy Road (N)															
7	L2	All MCs	67	33.4	67	33.4	0.075	8.1	LOS A	0.6	5.4	0.27	0.86	0.27	41.9
8	T1	All MCs	626	33.4	626	33.4	0.921	69.7	LOS E	22.3	200.6	1.00	1.13	1.33	28.1
9	R2	All MCs	21	33.4	21	33.4	0.135	61.4	LOS E	1.2	10.6	0.94	0.71	0.94	29.1
Approach			715	33.4	715	33.4	0.921	63.6	LOS E	22.3	200.6	0.93	1.09	1.22	28.9
West: Kalamunda Road (W)															
10	L2	All MCs	32	7.6	32	7.6	0.218	25.4	LOS C	5.7	42.7	0.76	0.65	0.76	38.1
11	T1	All MCs	312	7.6	312	7.6	0.333	33.4	LOS C	9.2	68.7	0.78	0.66	0.78	37.8
12	R2	All MCs	229	7.6	229	7.6	0.964	90.3	LOS F	17.5	130.5	1.00	1.10	1.51	23.9
Approach			573	7.6	573	7.6	0.964	55.7	LOS E	17.5	130.5	0.87	0.84	1.07	30.3
All Vehicles			3125	20.2	3125	20.2	0.964	70.6	LOS E	42.1	313.6	0.94	1.05	1.23	26.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

 **Site: [1 (7)] I-7_Kalamunda Road/Abernethy Road (S2: BG 2041+Dev - PM Peak)**
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 111.0 seconds (Site User-Given Cycle Time)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Abernethy Road (S)															
1	L2	All MCs	432	33.4	432	33.4	* 1.192	225.1	LOS F	81.3	731.7	1.00	1.78	2.47	13.4
2	T1	All MCs	848	33.4	848	33.4	1.192	237.9	LOS F	81.3	731.7	1.00	2.03	2.48	13.8
3	R2	All MCs	298	33.4	298	33.4	* 1.193	255.2	LOS F	35.5	319.2	1.00	1.60	2.56	12.0
Approach			1578	33.4	1578	33.4	1.193	237.7	LOS F	81.3	731.7	1.00	1.88	2.49	13.0
East: Kalamunda Road (E)															
4	L2	All MCs	185	7.6	185	7.6	0.718	39.2	LOS D	15.0	112.1	0.98	0.86	1.02	31.1
5	T1	All MCs	517	7.6	517	7.6	1.191	212.7	LOS F	48.6	362.2	1.00	1.67	2.21	14.3
6	R2	All MCs	62	7.6	62	7.6	0.525	80.8	LOS F	3.5	25.9	1.00	0.76	1.00	27.5
Approach			764	7.6	764	7.6	1.191	159.9	LOS F	48.6	362.2	0.99	1.40	1.82	16.3
North: Abernethy Road (N)															
7	L2	All MCs	84	33.4	84	33.4	0.114	13.2	LOS B	1.4	12.6	0.54	1.27	0.54	28.0
8	T1	All MCs	601	33.4	601	33.4	0.556	32.7	LOS C	13.4	120.5	0.87	0.75	0.87	39.1
9	R2	All MCs	34	33.4	34	33.4	0.135	49.7	LOS D	1.6	14.3	0.89	0.72	0.89	32.1
Approach			719	33.4	719	33.4	0.556	31.2	LOS C	13.4	120.5	0.83	0.81	0.83	37.2
West: Kalamunda Road (W)															
10	L2	All MCs	18	7.6	18	7.6	0.779	33.4	LOS C	15.4	114.9	1.00	0.92	1.11	32.2
11	T1	All MCs	674	7.6	674	7.6	* 1.192	170.5	LOS F	48.5	361.9	1.00	1.50	1.96	16.4
12	R2	All MCs	141	7.6	141	7.6	1.191	257.7	LOS F	16.6	123.8	1.00	1.48	2.62	13.0
Approach			833	7.6	833	7.6	1.192	182.3	LOS F	48.5	361.9	1.00	1.49	2.06	15.2
All Vehicles			3894	22.8	3894	22.8	1.193	172.5	LOS F	81.3	731.7	0.97	1.50	1.96	16.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

 **Site: [1 (10)] I-7_Kalamunda Road/Abernethy Road - with Improvements (S2: BG 2041+Dev - AM Peak)**
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80.0 seconds (Site Optimum Cycle Time - Minimum Delay)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]		[Total HV]					[Veh.]	Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Abernethy Road (S)															
1	L2	All MCs	118	33.4	118	33.4	0.753	28.5	LOS C	13.0	117.5	0.97	0.91	1.07	37.1
2	T1	All MCs	545	33.4	545	33.4	* 0.753	33.9	LOS C	13.0	117.5	0.97	0.91	1.08	39.2
3	R2	All MCs	151	33.4	151	33.4	* 0.662	49.6	LOS D	3.2	28.9	1.00	0.84	1.17	30.7
Approach			814	33.4	814	33.4	0.753	36.0	LOS D	13.0	117.5	0.98	0.90	1.10	37.1
East: Kalamunda Road (E)															
4	L2	All MCs	269	7.6	269	7.6	0.381	24.2	LOS C	7.5	56.1	0.76	0.78	0.76	40.1
5	T1	All MCs	663	7.6	663	7.6	* 0.753	33.7	LOS C	13.0	96.7	0.99	0.90	1.09	37.4
6	R2	All MCs	92	7.6	92	7.6	0.601	47.0	LOS D	3.8	28.0	1.00	0.81	1.07	31.7
Approach			1024	7.6	1024	7.6	0.753	32.4	LOS C	13.0	96.7	0.93	0.86	1.00	37.4
North: Abernethy Road (N)															
7	L2	All MCs	67	33.4	67	33.4	0.069	7.3	LOS A	0.5	4.2	0.23	0.84	0.23	41.7
8	T1	All MCs	626	33.4	626	33.4	0.723	31.1	LOS C	11.9	107.0	0.97	0.87	1.04	39.9
9	R2	All MCs	21	33.4	21	33.4	0.185	46.4	LOS D	0.8	7.5	0.97	0.70	0.97	33.1
Approach			715	33.4	715	33.4	0.723	29.3	LOS C	11.9	107.0	0.90	0.87	0.96	39.8
West: Kalamunda Road (W)															
10	L2	All MCs	32	7.6	32	7.6	0.387	24.3	LOS C	5.8	43.0	0.88	0.73	0.88	39.4
11	T1	All MCs	312	7.6	312	7.6	0.387	29.2	LOS C	5.8	43.0	0.89	0.73	0.89	39.6
12	R2	All MCs	229	7.6	229	7.6	* 0.753	49.4	LOS D	4.9	36.6	1.00	0.90	1.24	32.6
Approach			573	7.6	573	7.6	0.753	37.0	LOS D	5.8	43.0	0.93	0.80	1.03	36.3
All Vehicles			3125	20.2	3125	20.2	0.753	33.5	LOS C	13.0	117.5	0.93	0.86	1.02	37.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

 **Site: [1 (9)] I-7_Kalamunda Road/Abernethy Road - with Improvements (S2: BG 2041+Dev - PM Peak)**
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130.0 seconds (Site Optimum Cycle Time - Minimum Delay)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]		[Total HV]					[Veh.]	Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Abernethy Road (S)															
1	L2	All MCs	432	33.4	432	33.4	* 0.902	49.6	LOS D	44.3	398.6	1.00	0.99	1.14	31.2
2	T1	All MCs	848	33.4	848	33.4	0.902	52.0	LOS D	44.3	398.6	1.00	1.02	1.15	32.9
3	R2	All MCs	298	33.4	298	33.4	0.901	83.2	LOS F	11.0	98.9	1.00	1.03	1.38	23.4
Approach			1578	33.4	1578	33.4	0.902	57.3	LOS E	44.3	398.6	1.00	1.01	1.19	30.3
East: Kalamunda Road (E)															
4	L2	All MCs	185	7.6	185	7.6	0.284	36.6	LOS D	8.2	61.3	0.75	0.77	0.75	34.9
5	T1	All MCs	517	7.6	517	7.6	0.678	53.4	LOS D	15.4	114.9	0.98	0.83	0.98	31.0
6	R2	All MCs	62	7.6	62	7.6	0.756	81.9	LOS F	4.3	32.1	1.00	0.86	1.23	24.3
Approach			764	7.6	764	7.6	0.756	51.7	LOS D	15.4	114.9	0.93	0.82	0.95	30.8
North: Abernethy Road (N)															
7	L2	All MCs	84	33.4	84	33.4	0.099	11.6	LOS B	1.6	14.4	0.44	1.31	0.44	32.3
8	T1	All MCs	601	33.4	601	33.4	0.429	27.4	LOS C	13.2	118.5	0.74	0.65	0.74	41.5
9	R2	All MCs	34	33.4	34	33.4	0.204	64.6	LOS E	2.0	18.1	0.95	0.73	0.95	28.5
Approach			719	33.4	719	33.4	0.429	27.3	LOS C	13.2	118.5	0.72	0.73	0.72	39.5
West: Kalamunda Road (W)															
10	L2	All MCs	18	7.6	18	7.6	* 0.901	53.8	LOS D	24.8	184.5	1.00	1.06	1.24	27.8
11	T1	All MCs	674	7.6	674	7.6	0.901	68.3	LOS E	24.8	184.5	1.00	1.06	1.24	27.0
12	R2	All MCs	141	7.6	141	7.6	0.858	82.8	LOS F	5.0	37.6	1.00	0.93	1.39	25.1
Approach			833	7.6	833	7.6	0.901	70.4	LOS E	24.8	184.5	1.00	1.04	1.27	26.7
All Vehicles			3894	22.8	3894	22.8	0.902	53.4	LOS D	44.3	398.6	0.93	0.93	1.07	30.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)



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