Empirical Traffic Advisory

Riverlea - Precinct 3A

Land Division Masterplan

Transport Impact Assessment

#eta1000045

DATE

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1 INTRODUCTION

1.1 Background

Riverlea is a major development which will form a new township in the northern area of greater Adelaide. The township will provide approximately 12,000 dwellings, a district centre, neighbourhood centres, educational facilities, mixed use precincts and recreation precincts to cater for 33,000 residents. The development will be undertaken over 20 years.

Key to the development is the street and road network which will provide access for the daily services and needs of the community. A master plan has been prepared for the whole township, Precincts 1 and 2 now in progress to create the township. Precinct 3A is the first part of the next precinct to be developed along Riverlea Boulevard.

1.2 Purpose of this Report

This report sets out an assessment of the anticipated traffic and transport implications of the proposed development in Precinct 3A, including consideration of the:

- existing and estimated traffic conditions surrounding the site;
- traffic generation characteristics of the proposed development;
- proposed access arrangements for the site;
- overview of the layout based on integration with Precinct 2;
- transport impact of the development proposal on the surrounding township road network.

1.3 References

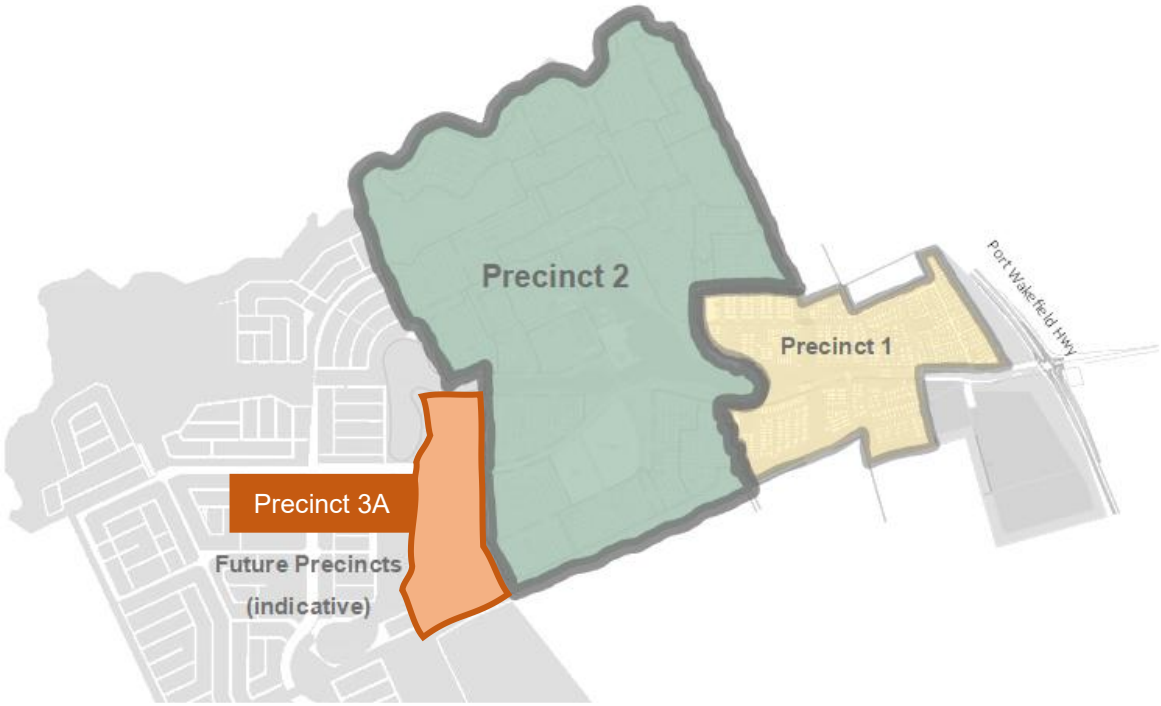
In preparing this report, reference has been made to a number of background documents, including:

- Riverlea - Precinct 2 Masterplan, Transport Impact Assessment, ETA 30 September 2024
- Masterplan for the proposed development provided by Walker Corp (dated 4th June 2013)
- Precinct 2 masterplan provided by Walker Corp (August 2022)
- '*Buckland Park Traffic Impact Assessment*' Parsons Brinckerhoff Australia Pty Ltd, 1 April 2009
- Riverlea Precinct 2 Traffic Assessment, GTA Consultants, 2015
- various technical data as referenced in this report
- other documents as nominated.

2 EXISTING CONDITIONS

The subject site is located within the Riverlea development, on the south-western corner of Precinct 2. The location of the site can be seen in Figure 2.1.

Figure 2.1: Site and Surrounding Environs



(Basemap courtesy of Walker Corp)

3 DEVELOPMENT PROPOSAL

The proposed development includes the provision of land located within Precicnt 3, labelled Precinct 3a, which is located directly adjacent the south-western corner of Precinct 2. Precinct 3a is proposed to comprise of approximately 738 low and medium density dwellings.

In the short term, access is proposed to be provided via Intersection 6, with connection to the northern and southern roads into the respective dwelling areas. Once future Precicnt 3 stages are completed, additional connections to Riverlea Boulevard would be available to the south.

The precinct road network will comprise of collector and local access roads, and some laneways.

The proposed site layout can be seen in Figure 3.1

Figure 3.1: Precinct 3A Layout

Source: Alexander Symonds

4 TRAFFIC ASSESSMENT

4.1 Previous Assessment

The traffic assessment for the previously approved Riverlea township was undertaken by Parsons Brinkerhoff (2013). The assessment was undertaken on the site master plan and did not consider individual precincts. However, the traffic assessment did include traffic generation of the master plan at 5-year intervals based on the anticipated dwelling occupancy.

ETA has also undertaken previous assessment of Precinct 2 in the report dated 30 September 2024, and supplementary report currently being prepared as part of a separate application..

4.2 Traffic Generation

4.2.1 Design Rates

The traffic generation rate of 8 trips per dwelling per day, and 0.85 trips per dwelling per hour (peak hour) as an average across all low to medium dwellings provides a robust method of traffic demand estimation, and has been used in the previous Riverlea traffic assessments for Precinct 2.

Precinct 3a comprises 738 dwellings (low and medium density) which will result in approximately 5,904 trips per day and approximately 627 trips per hour during the peak hours.

Based on the principles in the Precinct 2 assessments, the traffic associated with the commercial/retail uses within Precinct 2 are anticipated to be associated with Precinct 2 and 3a residents and not “passing trade” from along Port Wakefield Highway. Hence it can be assumed that approximately 30% of all traffic generated by Precinct 3a will be internal to the Precinct 2 and 3a sites.

4.2.2 Distribution and Assignment

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

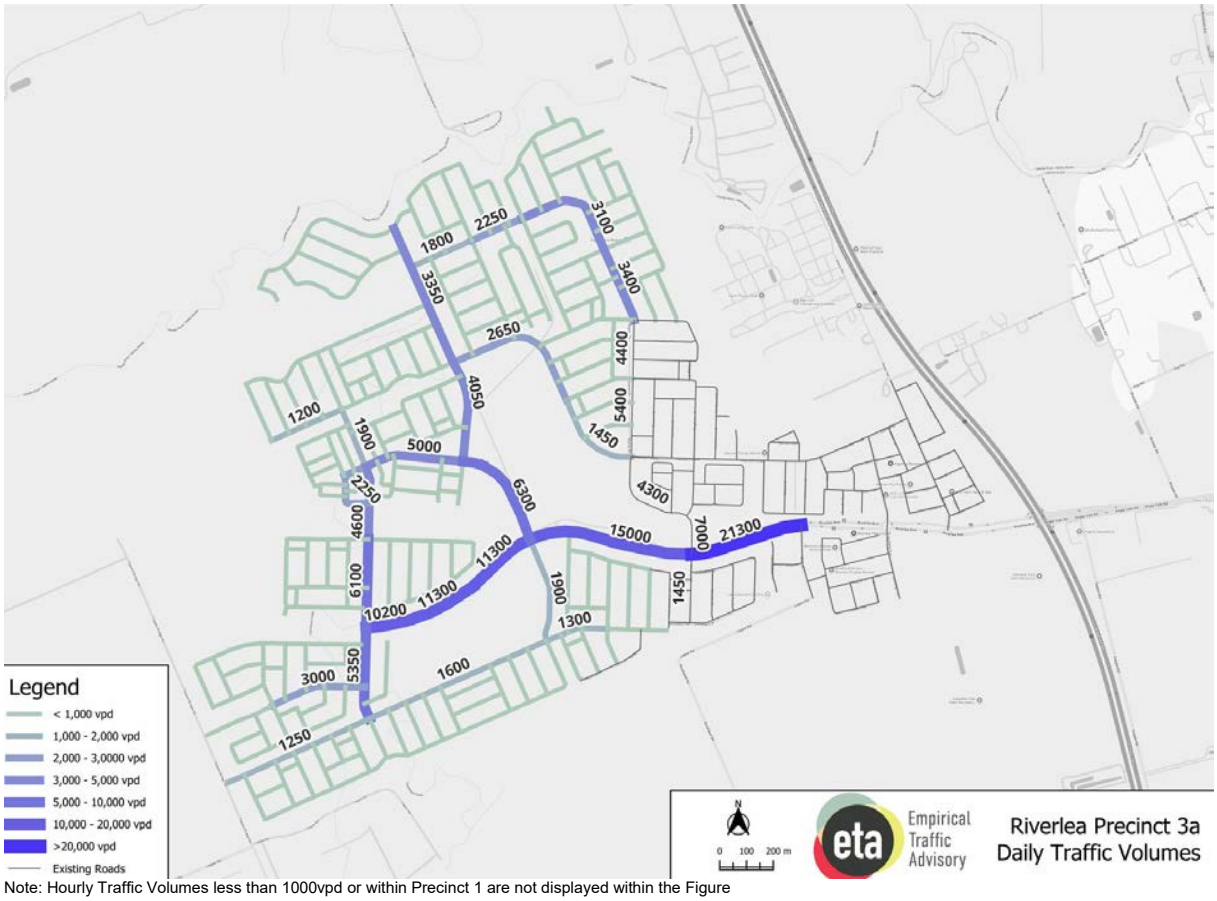
- configuration of the distributor road network in the immediate vicinity of the site;
- existing operation of intersections providing access between the local, collector and distributor road network;
- surrounding employment centres, retail centres and schools in relation to the site;
- configuration of access points to the site.

Having consideration to the above, it has assumed that 30% of all trips generated will be internal and the remaining 70% will be external to the Riverlea site (that is to and from Port Wakefield Highway and Angle Vale Road.

With the inclusion of Precicnt 3a volumes, the number of internal trips to the activity centre increases compared to recent assessments undertaken for Precinct 2. The increase in dwellings increases the level of self-sufficiency of the adjacent activity centre/school precincts, reducing the number of external trips to/from Port Wakefield Highway along Riverlea Boulevard.

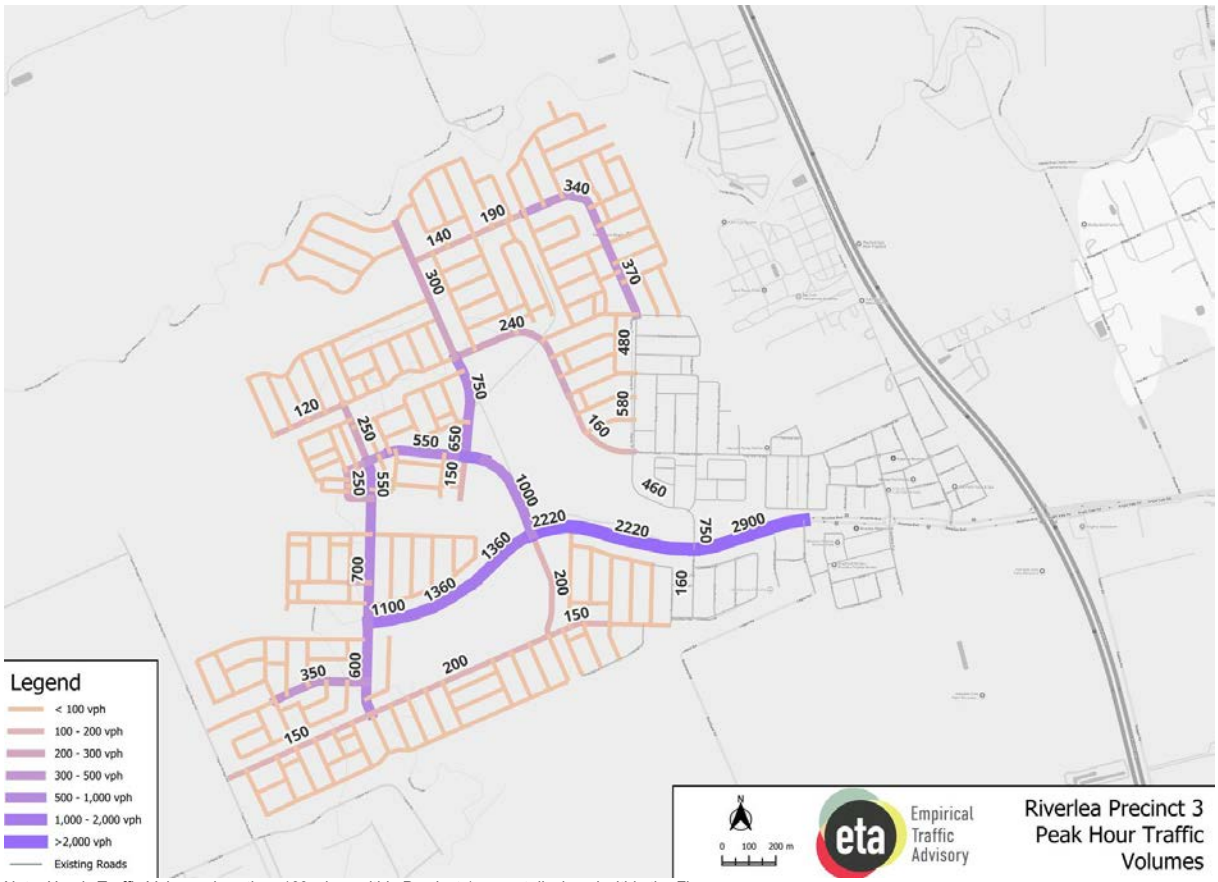
Based on the above, Figure 4.1 and Figure 4.2 indicate the predicted traffic volumes for daily and peak hour periods expected on the road network around Riverlea Boulevard. These volumes have been developed to assist in assessing the proposed intersections for appropriate layouts.

Figure 4.1: Predicted Daily Traffic Volumes



Note: Hourly Traffic Volumes less than 1000vpd or within Precinct 1 are not displayed within the Figure

Figure 4.2: Predicted Peak Hour Traffic Volumes



Note: Hourly Traffic Volumes less than 100vph or within Precinct 1 are not displayed within the Figure

In addition, the directional splits of traffic (i.e. the ratio between the inbound and outbound traffic movements) in the AM and PM peak periods are 90:10 (90% outbound 10% inbound) and 10:90 (10% outbound and 90% inbound) respectively for the external trips.

These AM directional splits have been assumed based on the majority of residential traffic likely to be leaving while the PM directional splits have been assumed based on some residents leaving for other activities external to the development site while the inbound traffic is generally residents returning from work.

The internal trip directional splits are assumed to be 50:50 during both peak periods. This internal traffic is likely to be more even with AM directional splits likely to be associated with student drop off and PM directional split likely to be a result of customers at the neighbourhood centre.

4.2.3 Future Traffic Demands – Ultimate Scenario

As the Riverlea development progresses to the west, there will be additional traffic demands on Riverlea Boulevard. The anticipated traffic volumes will be dependant on the future land uses to the west including additional neighbourhood centres, schools, and employment areas that define an areas level of self-sufficiency (that is ability to remain within that area for daily needs) and reduce external trips. As Riverlea develops further west, the level of self-sufficiency is expected to increase and reduce rate of growth of traffic on Riverlea Boulevard.

As part of this assessment, as the proposal increases the number of dwellings/apartments compared to the previous Precinct 2 assessment, the traffic volumes for the ultimate Riverlea site as determined by '*Buckland Park Traffic Impact Assessment*' (Parsons Brinckerhoff Australia Pty Ltd, 1 April 2009) have been reviewed. The review has considered the reduction in the future Precinct 3 stage yields as part of the increase in residential dwellings in Precinct 2 and Precinct 3a.

The additional traffic generation for the analysis from additional development to the west is expressed as additional trips per hour on Riverlea Boulevard for eastbound and westbound flows. These will be added to the Precinct 2 generated Riverlea Boulevard traffic volumes to identify future traffic volumes. These are shown below in Table 4.1.

Table 4.1: Ultimate Riverlea Development Additional Traffic

Riverlea Boulevard Direction Flow	Peak - Trips per hour	
	AM	**PM**
Eastbound	+396	+169
Westbound	+109	+366
Total	+505	+536

*Note: Additional traffic volumes based on percentage reduction of '*Buckland Park Traffic Impact Assessment*' (Parsons Brinckerhoff Australia Pty Ltd, 1 April 2009) as used in the previous Precinct 2 assessment, where intersections reached capacity.

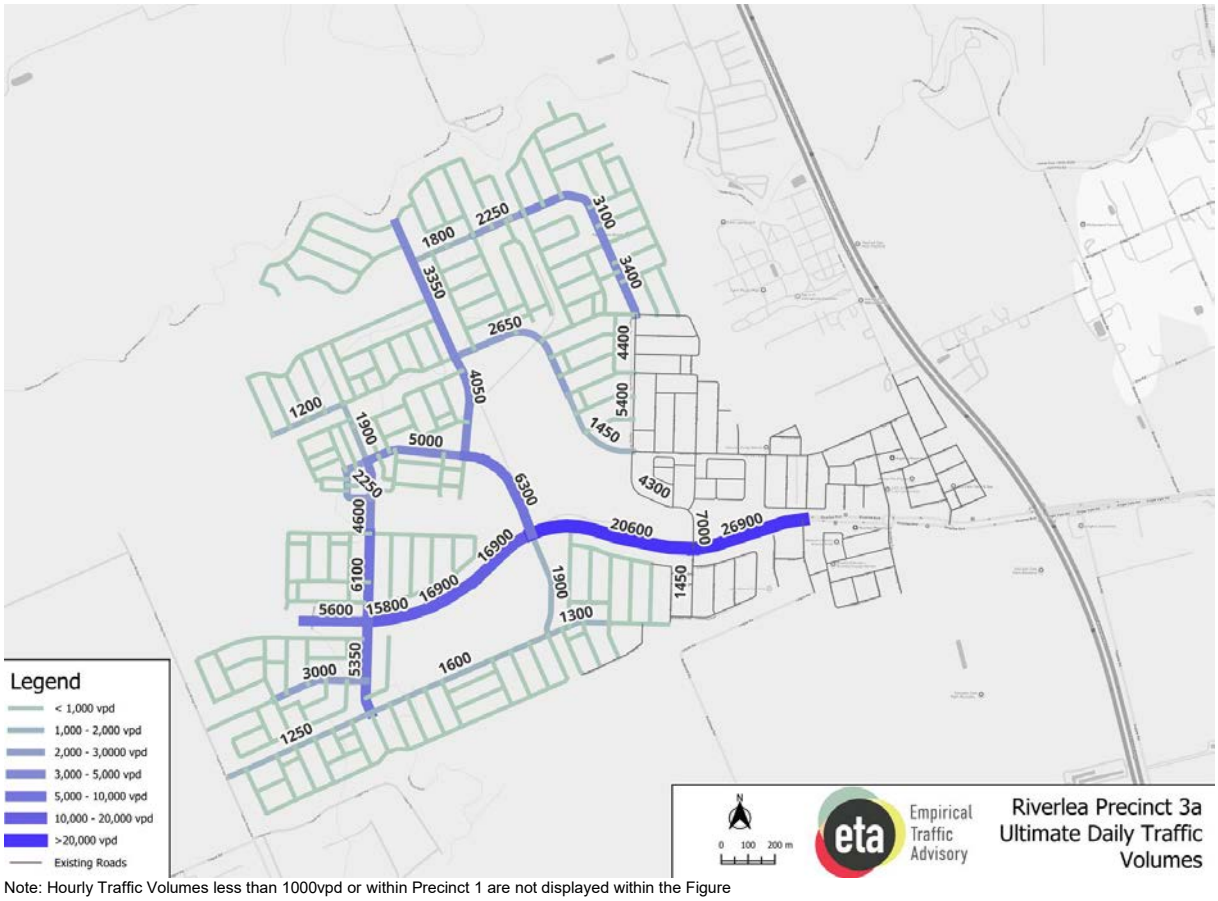
The peak hour volumes would translate to approximately 650 additional dwellings from future precincts of the development to the west. Based on current forecast yields of Precinct 3, these additional volumes and Precinct 3a dwelling numbers would account for approximately 46% of future Precinct 3 dwellings.

Utilising the above number of future dwellings, Figure 4.3 and Figure 4.4 indicate the predicted traffic volumes for daily and peak hour periods expected on the road network around Riverlea Boulevard incorporating approximately 46% of Precinct 3 (738 Precinct 3a dwellings, 650 dwellings in future Precinct 3 stages).

It should be noted that the modelling assumes all traffic from Precinct 3a, will use Intersection 6 northern and southern roads as a worst-case scenario of the intersection modelling, and for the anticipated construction processes. Once future Precinct 3b and beyond stages are completed, and Riverlea Boulevard is extended, drivers would redistribute to other intersections to minimise delays at intersections. This assumption is premised on the modelling which indicates that downstream intersections will begin to reach capacity with the ultimate traffic volumes. Hence, it would be more efficient for drivers to enter at the western end of Riverlea Boulevard (in Precinct 3) compared to other parts of the road network in order to minimise delays compared to attempting to join Riverlea Boulevard at other intersections in Precinct 2 to the east.

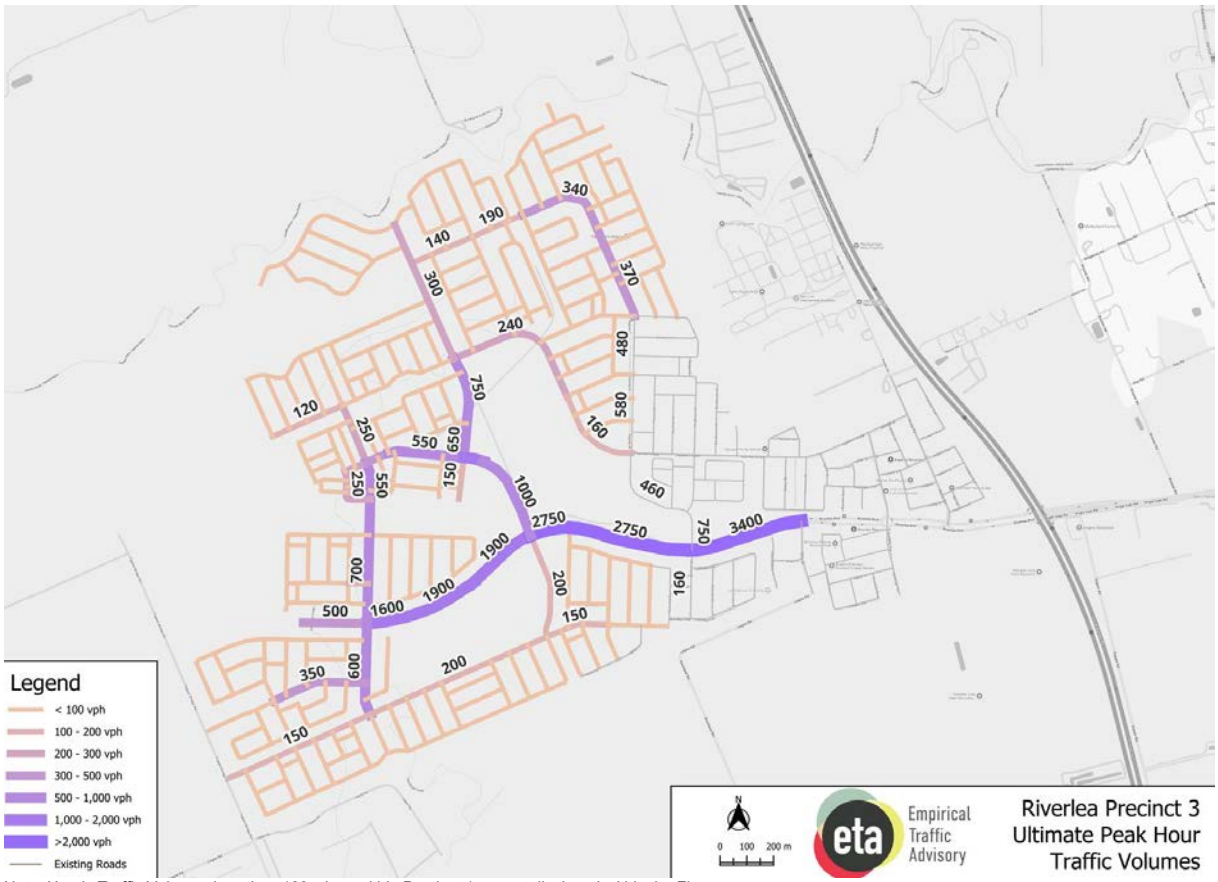
Whilst some traffic could be expected to use the collector road network in the northern part of Precinct 2, it is expected that these volumes would remain low and within collector road volumes (i.e. less than 3,000 vehicles per day).

Figure 4.3: Predicted Daily Traffic Volumes With Future Volumes



Note: Hourly Traffic Volumes less than 1000vpd or within Precinct 1 are not displayed within the Figure

Figure 4.4: Predicted Peak Hour Traffic Volumes With Future Volumes



Note: Hourly Traffic Volumes less than 100vph or within Precinct 1 are not displayed within the Figure

As development occurs to the west, it would be expected that traffic assessments will be revised at key intervals for intersections on Riverlea Boulevard, as well as monitoring of traffic volumes to ascertain operating conditions actually occurring.

4.3 Traffic Impact

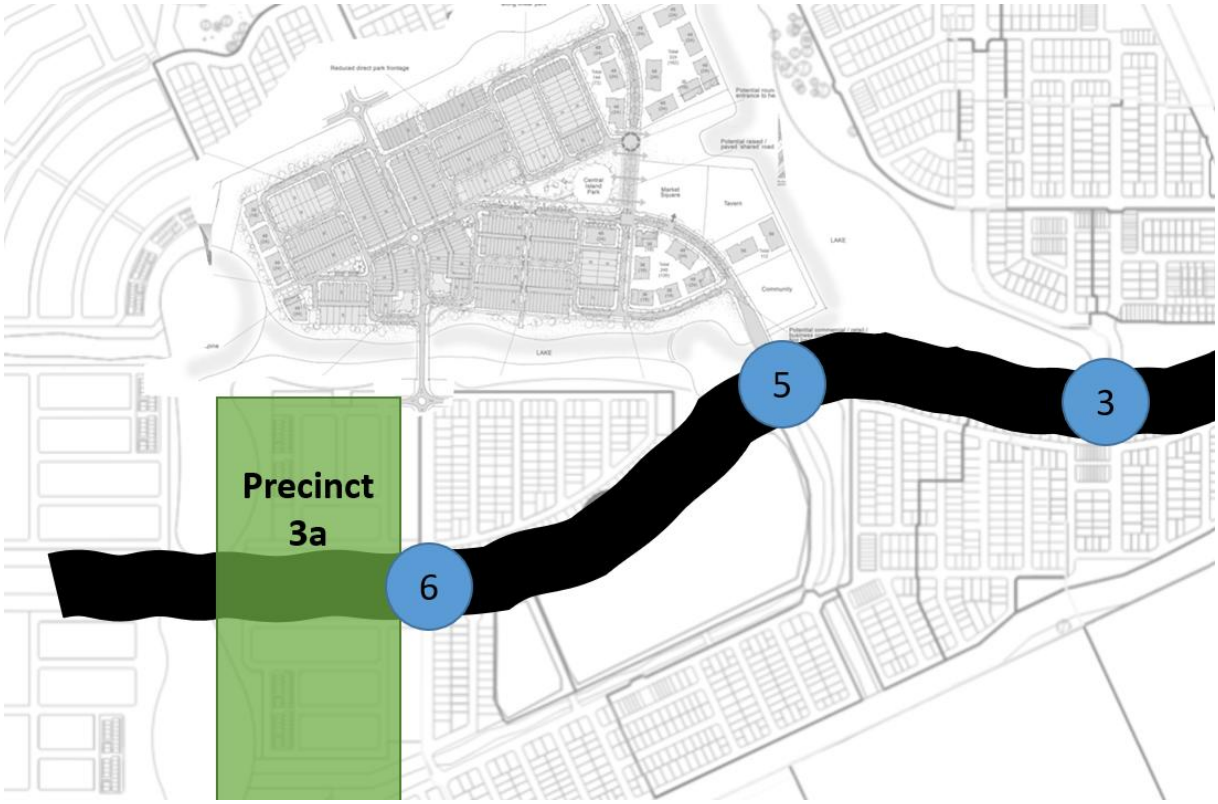
The impact of Precinct 2 traffic on the road network intersections is considered in this section with up to three intersection layouts considered as follows:

Initial The initial intersection layout proposed for the precinct.

Ultimate The ultimate layout of the intersection when considering ultimate traffic volumes on Riverlea Boulevard

The impact of the development traffic has been assessed using SIDRA Intersection at key intersections throughout Precinct 2, based on the changes to the island. The key intersection locations are shown in Figure 4.5.

Figure 4.5: Location of Key Intersections



Given Precinct 1 and 2 has commenced with construction of some intersections, this assessment will only consider key intersections within Precinct 2, relating to the 4 way intersections on Riverlea Boulevard.

A summary of the intersections from previous assessments are shown in Table 4.2.

Table 4.2: Summary of intersections on Riverlea Boulevard

Intersection		Description
Precinct 2	3	Proposed 4-way intersection with 2-lane roundabout.
	5	Proposed 4-way intersection in Precinct 2 – Provides access to Neighbourhood Centre and School/Sports Grounds.
	6	Proposed roundabout for residential access. End of Precinct 2.

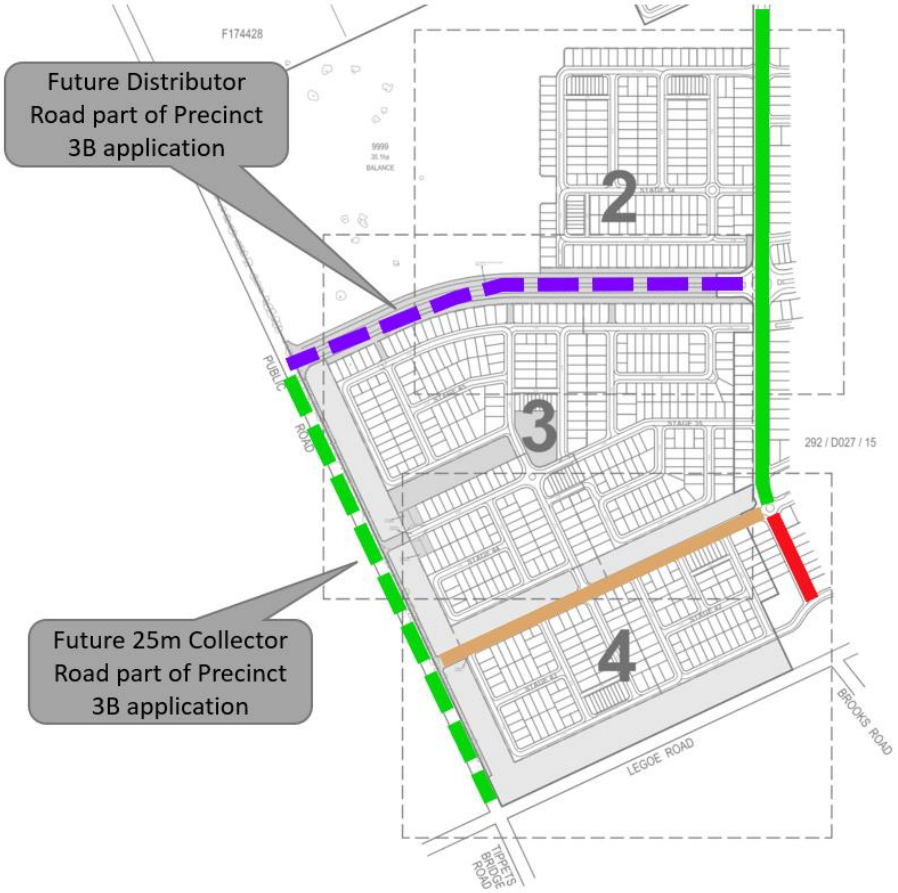
The impacts to the Riverlea Boulevard intersections further to the east of Intersection 3 are considered to have been assessed as part of the Ultimate traffic volumes of the previous assessments of Precinct 1 and the overall masterplan assessment. The volumes associated with Precinct 3a would have been factored into the Ultimate traffic volumes as through movements on Riverlea Boulevard. Therefore, it is considered that further analysis at this stage is not required for the intersections to the east.

5 ACCESS

The layout of the street network for the proposed development is based on a modified grid layout, with local streets connecting to collector streets to the east in Precinct 2 and then to the distributor road (Riverlea Boulevard). A modified grid can provide advantages to a residential area in managing traffic to low volumes on each street, limiting the ability for rat-running through the area, managing the speed environment and providing convenient access for walking, cycling and public transport through the area. The proposed development will be primarily local streets with and without indented parking as shown on the concept plans.

The proposed road configuration is shown in Figure 5.1 which indicates the road hierarchy and traffic management.

Figure 5.1: Proposed Road Hierarchy

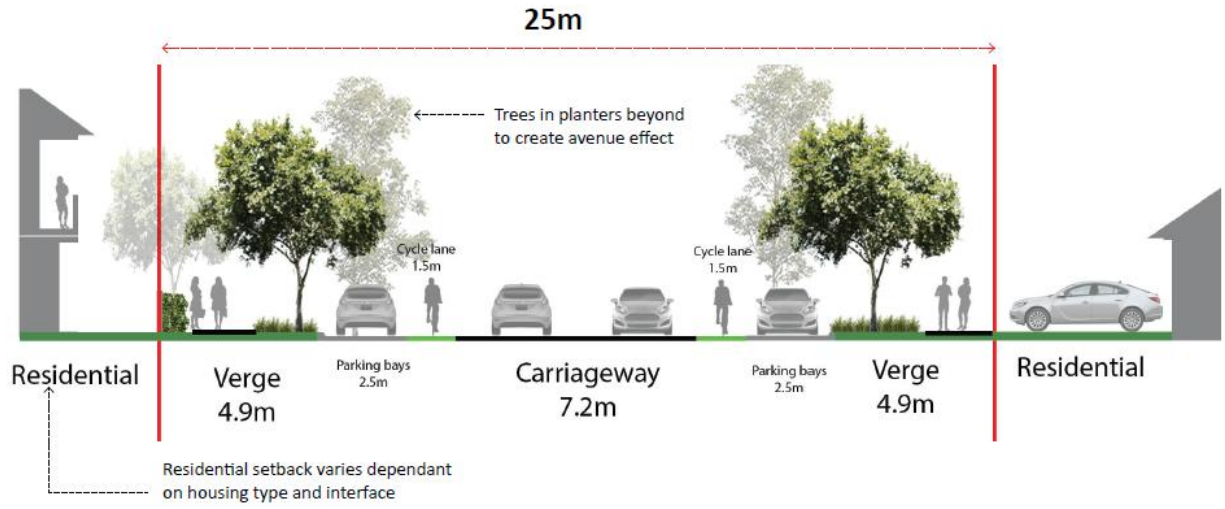


Type	Reserve width	Carriageway	Travel lanes	Bicycle lanes	Median	Indented Parking	Footpath	Bus route
Width (m)	metres		3.6	1.5		2.5	2	
Distributor (Riverlea Blvd.)	36.6	Dual	4	✓ (1.8m)	6m (min)	no	✓	✓
Neighbourhood Centre	28.5	Single (split)	2	✓	3.5m	both sides	×	✓
Collector A	25	Single	2	✓	×	both sides	✓	✓
Collector B	22	Single	2	×	×	both sides	×	×
Collector C	20	Single	2	✓	×	reserve side only	✓	×
Collector D	19	Single	2	×	×	both sides	×	×
Local Esplanade Roads	16	Single	2	×	×	reserve side only	✓	×
Local Street	16	Single	2	×	×	on street	×	×
Local Esplanade Streets	14	Single	2	×	×	on street	✓	×
Laneway	9	Single	2 x 3.5m	×	×	×	×	×

5.1 Road Cross Sections

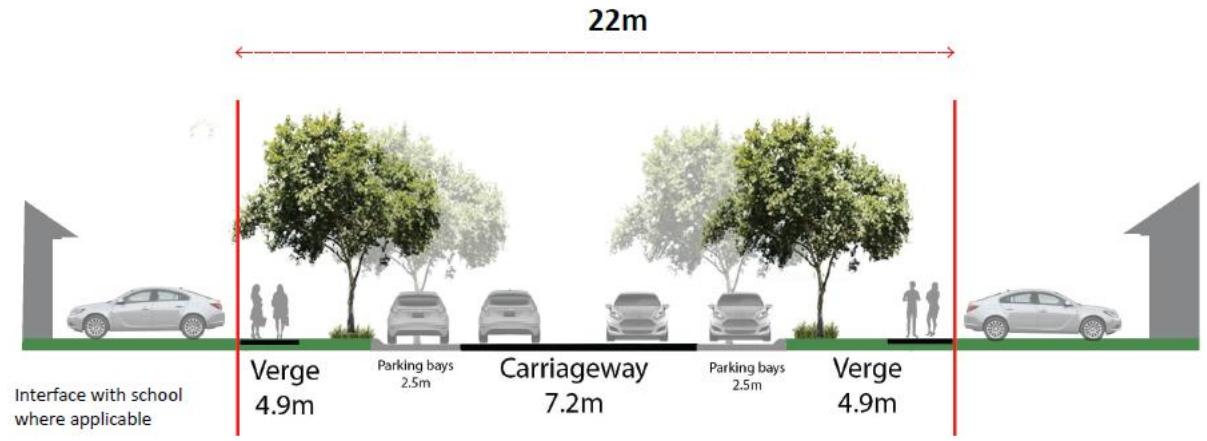
The proposed development will comprise primarily local roads providing access to residential dwellings. Cross sections have been developed in conjunction with the Landscape Plan and are shown in the following figures.

Figure 5.2: Cross Section – Collector Road A



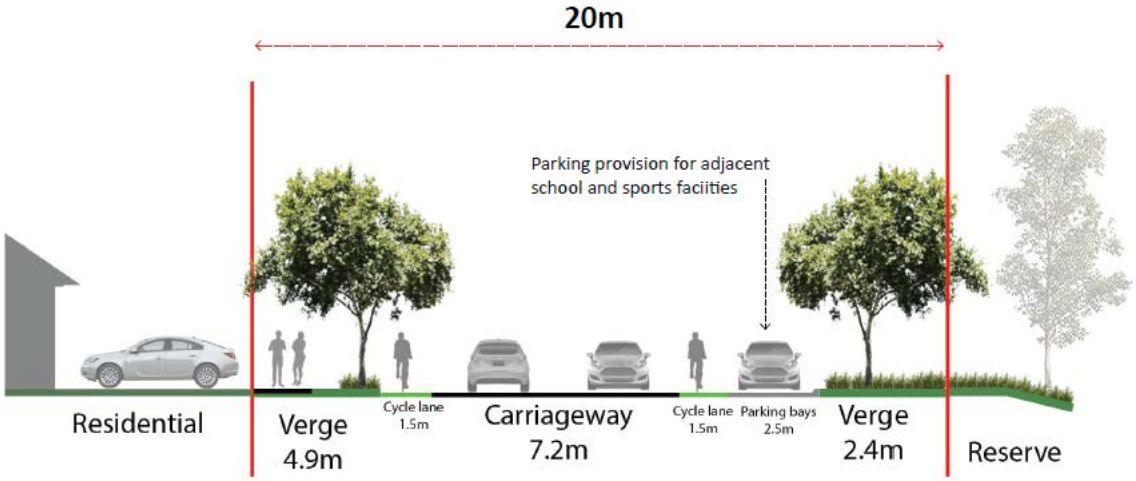
General Residential Collector Road accommodating bus route, cycle lanes and indented car parking

Figure 5.3: Cross Section – Collector Road B



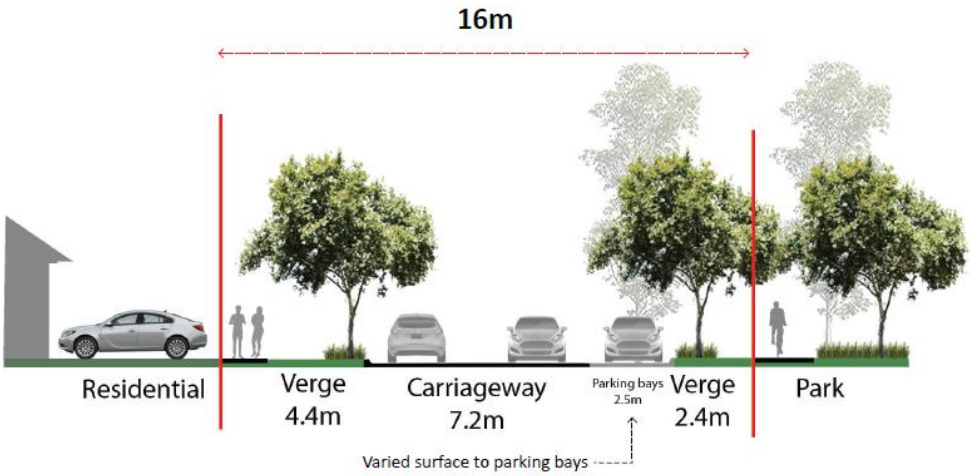
Residential Collector Road accommodating indented car parking and footpaths. Utilised as a 'kiss and ride' school collector road.

Figure 5.4: Cross Section – Collector Road C



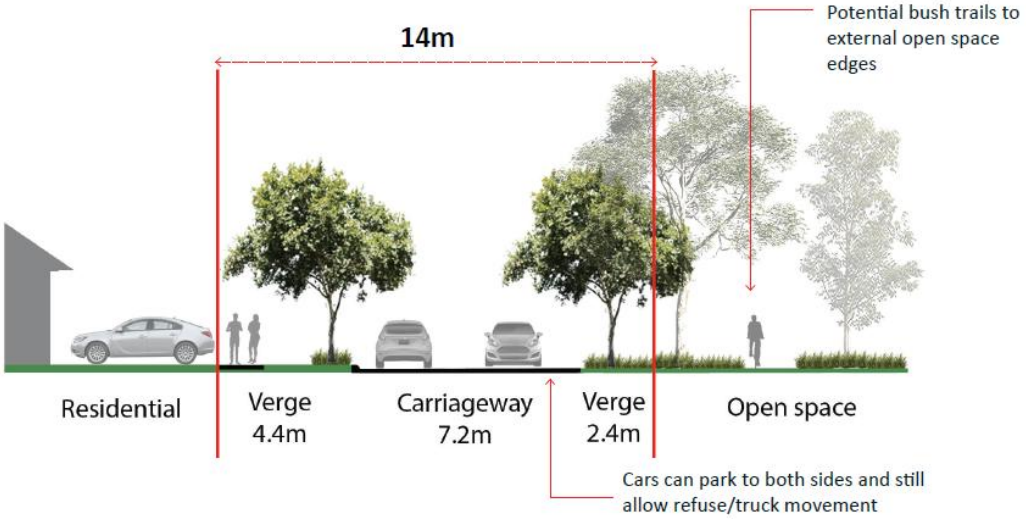
Residential Collector Road alongside drainage reserve where cycle lane connection is required. Includes indented car parking to residential frontages

Figure 5.5: Local Esplanade Roads (with indented parking)



Local residential roads with optional indented car parking bays to drainage reserve frontage

Figure 5.6: Local Esplanade Roads (on-street parking)



Local residential streets interfacing with open space, external boundaries and reserves, accommodating on-street car parking

Figure 5.7: Local Streets

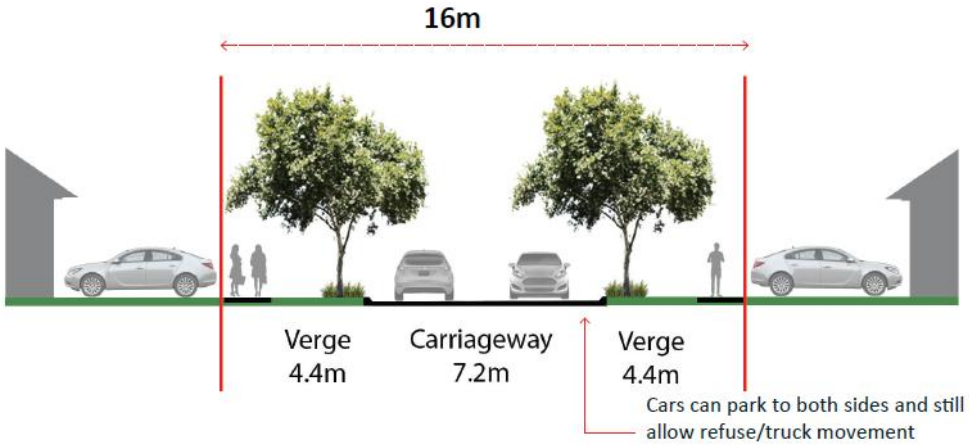


Figure 5.8: Local Street/Laneway

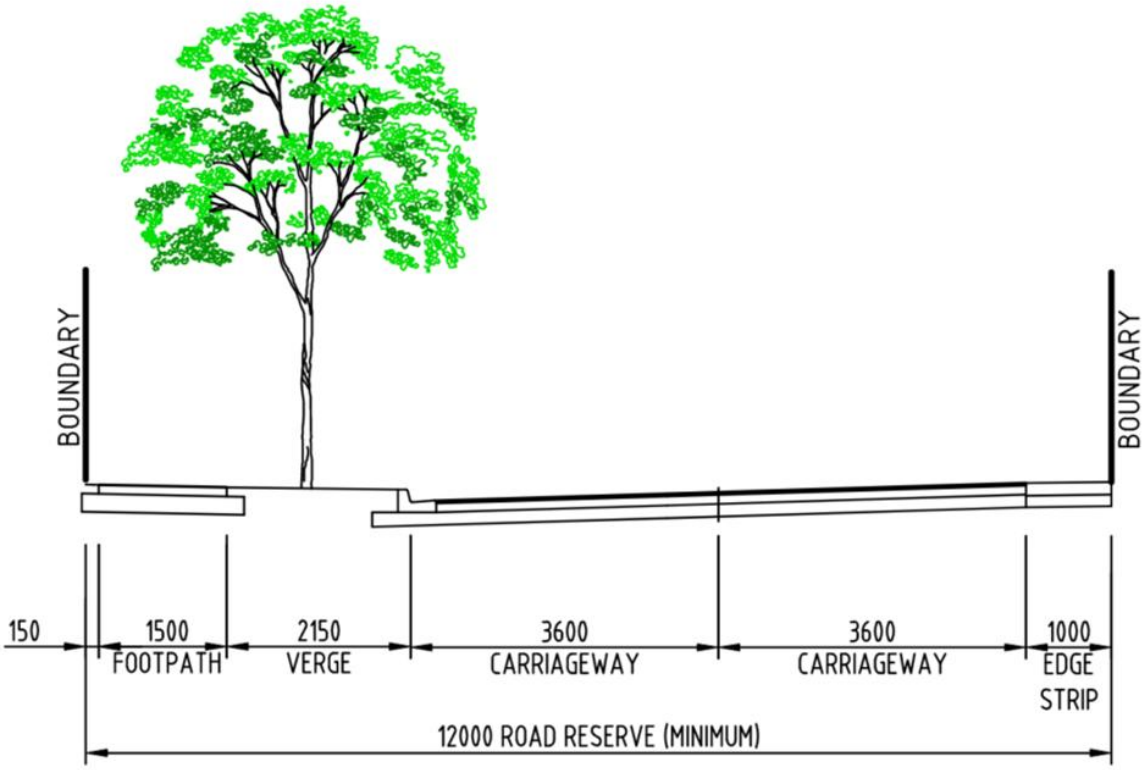
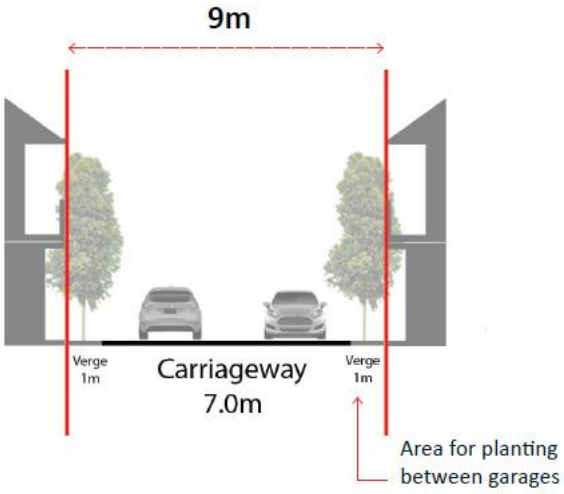


Figure 5.9: Laneways



5.2 T-junctions

The majority of the local street intersections within the proposed development will be controlled by T-Junctions. Realigned T-junctions are proposed at number of locations throughout the development. A realigned T-junction is designed to effect a change in the vehicle travel path thereby slowing traffic via deflection of traffic movements and/or reassignment of priority. These are effective in limiting street lengths and managing speeds on a local road network whilst maintaining a modified grid network. As a result, the safety within the local road network can be improved.

Austroads guidelines provide recommendations for the separation of staggered T-junctions. It is noted that the guidelines do not specify requirements for urban environments, with the requirements for rural environments. These are commonly utilised in urban environments as an assessment basis. Austroads requirements indicate a minimum stagger distance of 15m to 30m (measured from road centrelines). Where applicable within the precinct, staggered T-junctions provided more than 15m separation, meeting the Austroads Requirements.

Traffic management measures are required at T-junctions to ensure drivers understand the give-way priority assigned. Generally, the right angle bend in conjunction with appropriate kerb alignments will be sufficient however a review in detailed design should consider the following methods to clarify give way priority:

- Give way signs on the minor road approach.
- Pavement marking on the bend for the centreline and parking control.
- Distinctive pavement on the minor road approach.
- Consideration of the radius of bends to ensure suitable turn paths are achieved for the anticipated traffic volumes and vehicle types.

As part of the proposed road layout, Stage 35, 44 and 45 layout provides one connection to Precinct 2 and one connection to Stage 42/43, which would both be operational before all houses in the vicinity are occupied. There will also be a future connection to the west to a future collector road (25m wide reserve) as part of the Precinct 3b application. This future connection combined with the connections to Stage 42/43 and Precinct 2 will assist in distributing the traffic volumes around the road network. No turning treatment is proposed to the Precinct 2/Stage 35 road, due to consideration to the future connectivity around associated the stage. This approach is similar to other locations in Riverlea where there are similar T-junctions which serve similar traffic volumes where no turn treatment has been provided.

5.3 Roundabouts

A roundabout is an effective form of intersection control and reduces the relative speeds of conflicting vehicles by providing impedance to all vehicles entering the roundabout. A roundabout controlled intersection is proposed in Precinct 3a, especially where the roads form a four-way intersection.

It is recommended that the roundabouts be designed to allow full turning movements for larger vehicles, and in order to cater for semi-trailers a mountable island should be provided. The roundabouts will be required to conform to the relevant standards and guidelines, and the Code, which would be confirmed in detailed design.

5.4 Cul-de-sacs & Laneways

The development will incorporate circular cul-de-sacs at a number of locations. It is recommended that 18 metre diameter circular cul-de-sacs be provided to enable turning movements by larger vehicles including waste collection vehicles.

Laneways are proposed in a number of locations to provide rear-loaded access to higher density dwellings, for instance row dwellings. The laneways will be wide enough to enable access to garages, provide for rear waste collection.

5.5 Vehicle Speed Management

Austroads Guide to Road Design Part 3: Geometric Design states a typical acceleration of 1km/h for every 5 metres is possible for private vehicles from a stationary position. Therefore, a vehicle can be expected to reach 50km/h (the expected posted speed limit) from a stopped position after 250 metres.

Figure 3.4 Acceleration on straights (in the Guide) indicates that based on an entry speed of 20km/h (typical for most right angle bends) straights up to 300 metres in length will maintain a maximum speed of 40km/h. This would to most local streets in a semi-grid layout as proposed in Precinct 2.

Streets with higher entry speeds would be collector roads where roundabouts are typically used to manage speeds along these roads. With an entry speed of 30km/h, straights of up to 300 metres will maintain speeds less than 50km/h which would be suitable for collector roads.

Generally, most streets in the proposed development will be less than 300 metres in length. These streets will generally assist in creating a speed environment of less than 50km/h, and closer to 35km/h where streets are less than 200 metres long.

Urban design techniques to assist in managing vehicle speeds including tree plantings and house design/driveways, in conjunction with carriageway design techniques will be considered in the context of street design features to manage speeds.

Notwithstanding the above, vehicle speeds within Precinct 2 will be generally managed and can be confirmed in design of the built form for the land division.

5.6 Intersection Sight Distance

In order to provide fundamental safety at intersections, adequate sight distances must be provided at each one. There are three categories of sight distances, these are:

- Approach Sight Distance (ASD)
- Safe Intersection Sight Distance (SISD)
- Minimum Gap Sight Distance (MGSD).

A description and review of each of these sight distances for the proposed development is discussed in the following sections.

Approach Sight Distance (ASD)

ASD is the sight distance required for a driver of a vehicle on a minor road approaching an intersection to observe the holding line for the intersection on the ground. The distance is required such that the driver can observe the holding line, react and stop as required.

Based upon the table provided with the Austroads '*Guide to Road Design Part 4a: Signalised and Signalised Intersections*' (2009, henceforth referred to as Austroads Guide) a design speed of 50km/h has an ASD of 55 metres.

Safe Intersection Sight Distance (SISD)

SISD is the sight distance required for a driver of a vehicle on a major road approaching an intersection to observe a vehicle within the intersection. The SISD is required such that if a vehicle has stopped (i.e. stalled) within an intersection the driver of the approach vehicle on the major road will observe the vehicle and be able to react and stop if required.

Based upon the table provided with the Austroads Guide a design speed of 50km/h has an SISD of 97 metres.

Minimum Gap Sight Distance (MGSD)

MGSD is the sight distance required for a driver of a vehicle on a minor road at the intersection to observe vehicles in the conflicting streams. The distance is required such that the vehicle can view approaching vehicles in order to safely commence the desired manoeuvre.

The MGSD is based upon the number of lanes the vehicle is required to cross, the type of manoeuvre that is required.

Austroads Guide requires a road with a design speed of 50km/h has an MGSD of 69 metres for the critical right turn movement on a two lane/two way road.

Sight Distance Summary

An assessment of the above horizontal sight distances indicates the intersections within the proposed development can provide the minimum requirements. A further sight distance assessment is recommended during detailed design to ensure the horizontal and vertical sight distances are met.

5.7 Street Gradients for Vehicles

It is noted that the current site is very flat and roads will generally be designed with appropriate grades for stormwater management, as opposed to achieving compatibility with existing terrain in undulating environments. Hence, grades of streets are not considered to be an issue within the precinct.

5.8 Parking

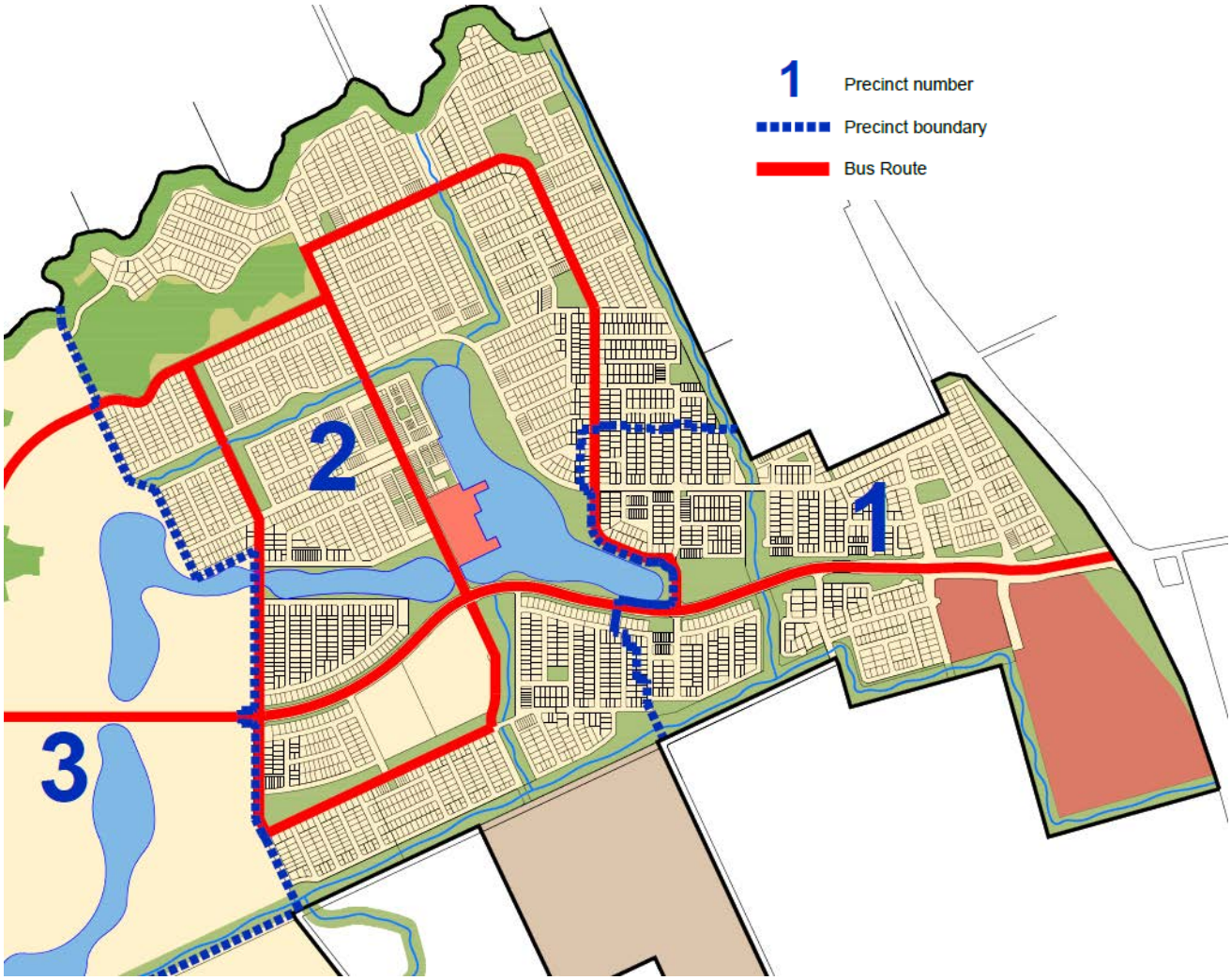
The proposed development will provide a high level of on-street parking which will cater for a minimum of 1 on-street space per 3 dwellings or more based on the proposed road cross sections. These cross sections include a variety on-street parking on the carriageway or indented parking bays.

The frontages of reserves will provide a high level of parking where available. The need for parking at reserves has been considered by an assessment provided in Appendix A.

5.9 Public Transport

Bus routes are proposed to provide public transport access to the Riverlea township. Figure 5.10 indicates the road network to be available for bus services. The actual services will be confirmed on conjunction with agreement from the Department for Infrastructure and Transport. It is envisaged that the proposed bus routes will utilise the distributor and collector roads to provide a bus route that will be within approximately 400 metres of all residential allotments within the Riverlea township.

Figure 5.10: Proposed Bus Routes Precincts 1 and 2



Extract from Walker plan "Overall Bus Routes", 12 April 2023

5.10 Heavy Vehicles

Heavy vehicles will use the proposed road network on an occasional service for waste collection within the proposed residential area. The proposed road network will be capable of providing appropriate access subject to detailed design of intersections and junction to ensure safe and appropriate turning movements are available.

The cul-de-sac streets will enable trucks to turn to enter and exit in a forward direction. The cul-de-sacs should be confirmed in detailed design to ensure adequate space is available.

5.11 Bicycle Access

Bicycle access is proposed with bicycle routes on key collector roads in Precinct 2 (adjacent to Precinct 3a) where bicycle lanes and/or paths can be considered. These roads will provide key access within and throughout the overall site for bicycles. The low speed design and low volumes on most of the local street network will also facilitate safe bicycle access. The proposed network will provide a high level of accessibility to the neighbourhood centre and school precincts within the site.

6 INTERSECTIONS

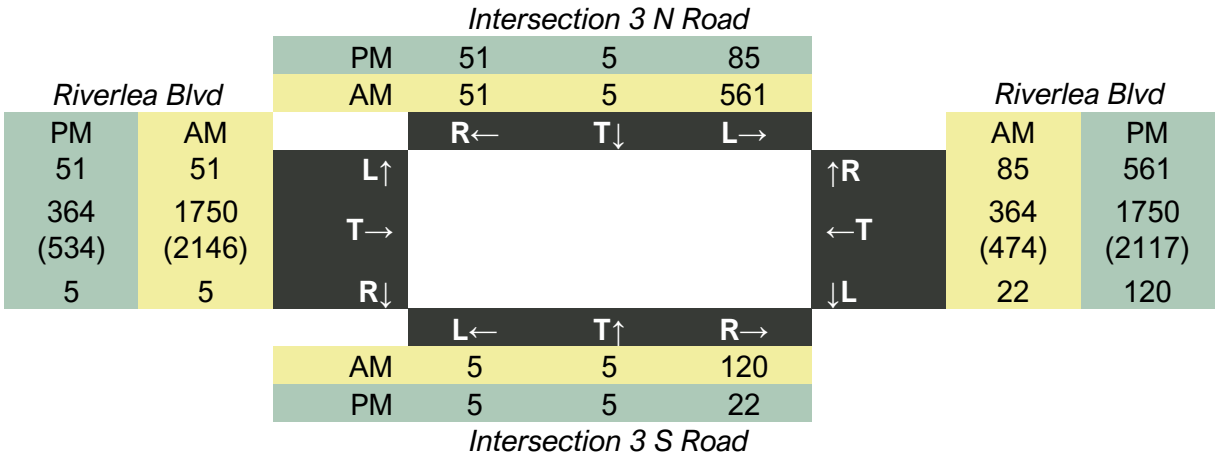
Each intersection has been assessed individually for performance based on anticipated traffic demands. Intersection layouts have been based on the as built/construction plans where available or schematic layouts for each intersection to indicate required lane arrangements. Other features such as pedestrian crossings, suitable turn paths for design vehicles and location of traffic signal posts are assumed to be included and to be confirmed in detailed design.

6.1 Intersection 3 Assessment

A roundabout is proposed at this intersection as part of Precinct 1 development (Silverleaf Drive in Stage 4), with 2 lanes for eastbound and westbound traffic on Riverlea Boulevard. A single lane approach for the north and south legs.

The anticipated AM and PM peak hour traffic volumes for Precinct 2 and 3a volumes at intersection 3 are shown in Figure 6.1. The Ultimate through volumes on Riverlea Drive are also shown.

Figure 6.1: Intersection 3 – AM & PM Peak Hour Turning Volumes



Through values on Riverlea Boulevard within Brackets indicate the future traffic for the Ultimate intersection analysis.

6.1.1 Intersection 3 Analysis Summary

A summary of the Intersection 3 analysis is summarised in Table 6.1. SIDRA intersection outputs are provided in Appendix A.

Table 6.1: Intersection 3 – SIDRA Summary

Intersection Type	Peak Period	Degree of Saturation	Level of Service	Maximum Vehicle Queue (m)
Roundabout Initial Layout	AM Peak	0.739	A	52.8
	PM Peak	0.817	A	109.5
Roundabout Initial Layout - Upgrade Trigger	AM Peak	0.813	A	64.0
	PM Peak	0.849	A	131.7
Signals Ultimate Volumes	AM Peak	0.846	A	183.9
	PM Peak	0.786	A	55.4

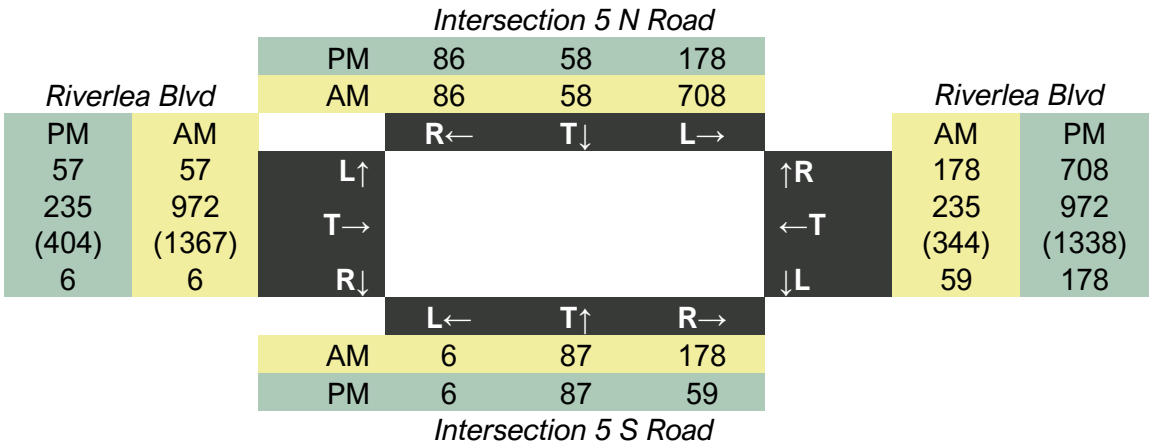
The SIDRA Intersection analysis indicates that the as built roundabout at Intersection 3 will operate satisfactorily and within capacity for the predicted Precinct 3a traffic volumes, and up to 170 dwellings of Precinct 3b and beyond.

Traffic signals will be required in the ultimate layout when Riverlea is developed to the west. In particular, a free flowing left turn will be required from Osprey Drive (north leg) to Riverlea Boulevard (east leg) due to the high eastbound flows on Riverlea Boulevard in the AM peak period and filtered right turn movements to accommodate the high right turn flows northbound in the PM peak period.

6.2 Intersection 5 Assessment

Intersection 5 is proposed to be a four-way intersection linking between the Neighbourhood Centre to the north and school/sports precinct to the south of Riverlea Boulevard. This intersection is a key location for access in this precinct, in particular for pedestrian and cyclist movements to and from retail/commercial, school and sporting uses. The anticipated AM and PM peak hour traffic volumes for Precinct 2 and 3a volumes at intersection 5 are shown in Figure 6.1. There will be high traffic volume of vehicle turning left from NCe Road to travel east on Riverlea Boulevard in the AM Peak, and return to turn right into NCe Road in the PM peak.

Figure 6.2: Intersection 5 – AM & PM Peak Hour Turning Volumes



It is noted that compared to the previous Precinct 2 assessment, some of the turning movements have reduced. This is due to a reduction in the external trips associated with the school and neighbourhood centre in Precinct 2, which before relied on more external trips compared to with consideration to Precinct 3a.

6.2.1 Intersection 5 Analysis Summary

A summary of the Intersection 5 analysis is summarised in Table 6.2. SIDRA intersection outputs are provided in Appendix B.

Table 6.2: Intersection 5 – SIDRA Summary

Intersection Type	Peak Period	Degree of Saturation	Level of Service	Maximum Vehicle Queue (m)
Signalised Precinct 3 Volumes	AM Peak	0.824	D	216.6
	PM Peak	0.889	D	242.9
Signalised Ultimate Volumes	AM Peak	0.890	E	387.1
	PM Peak	0.887	D	383.8

Intersection 5 will provide access to the proposed Neighbourhood Centre (to the north) and Sports Fields/School to the south. It will have a mix of traffic movements in conjunction with high flows on Riverlea Boulevard. Pedestrian access should be considered at this intersection with crossings on each side of the intersection.

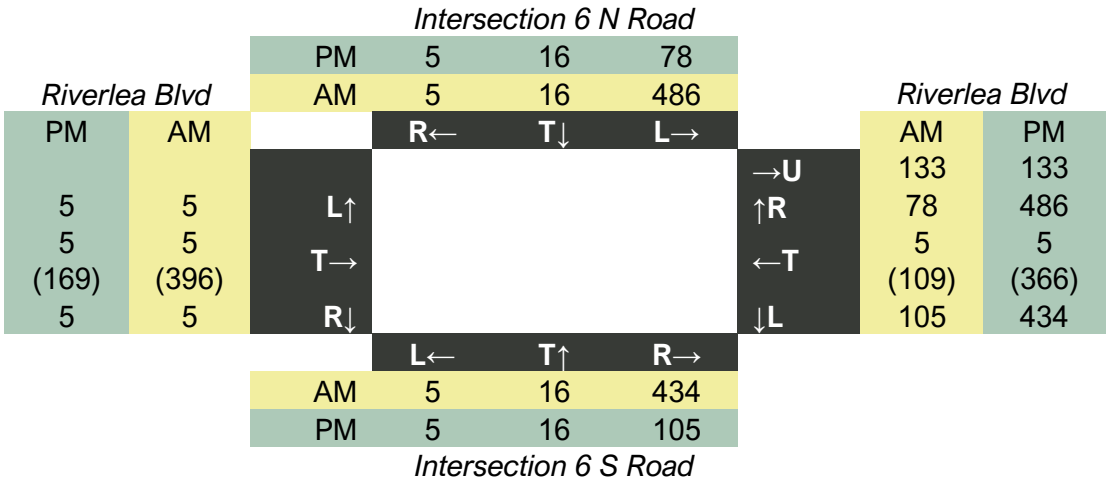
The Precinct 3 PM peak period indicates that the right turn movements to the NCe Road will over spill the capacity of the turning lane. While the lane is overspilling, the volume of westbound vehicles is able to traverse the intersection with minimal impacts.

6.3 Intersection 6 Assessment

Intersection 6 will initially be at the end of the Riverlea Precicnt 2 development, with a roundabout proposed to connect to residential stages to the north and south with provision to continue Riverlea Boulevard to the west.

The anticipated AM and PM peak hour traffic volumes for Precinct 2 volumes at intersection 5 are shown in Table 6.3.

Figure 6.3: Intersection 6 – AM & PM Peak Hour Turning Volumes



6.3.1 Intersection 6 Summary

A summary of the Intersection 6 analysis is summarised in Table 6.3. SIDRA intersection outputs are provided in Appendix C.

Table 6.3: Intersection 6 – SIDRA Summary

Intersection Type	Peak Period	Degree of Saturation	Level of Service	Maximum Vehicle Queue (m)
Roundabout Precinct 2 Volumes	AM Peak	0.602	A	40.5
	PM Peak	0.371	A	22.3
Roundabout Ultimate Volumes	AM Peak	0.728	A	52.0
	PM Peak	0.460	A	32.0

The modelling indicates that the ultimate layout for the intersection will be able to adequately cater for the ultimate volumes with the extension of Riverlea Boulevard to the west.

6.4 Intersection Summary

The analysis of the intersections in Precinct 2 indicates that in general, the as built/construction plans of the intersections can accommodate the Initial and Ultimate traffic volumes. only intersection within Precinct 2 that requires upgrading to accommodate the traffic volumes is Intersection 3.

A comparison of the intersection spacing (excluding unsignalised intersections) and the 95th percentile queues of the ultimate volumes are outlined in Table 6.4. The modelling indicates that the maximum vehicle queues in the AM and PM peaks are not to extend into the intersections.

Table 6.4: Intersection Distance and 95th%ile Queue Comparison

Intersection	Distance to Next Intersection - West (m)	Max 95th%ile Queue to West (m)	Distance to Next Intersection - East (m)	Max 95th%ile Queue to East (m)
3	580	183.9	730	55.4
5	440	387.1	580	383.8
6	-	14.3	200	32.0

6.5 Intersection Upgrade Timing

The likely need to upgrade the intersections from interim to ultimate based on future development to the west for Precinct 3 and 4 has been reviewed as part of the intersection analysis. For this assessment, it should be noted that the additional traffic volumes assumed to be from the west (from the whole development) has been developed from the original PB modelling which considered a secondary access and high level of self-sufficiency in each precinct with schools, employment and activity centres. In simple terms this equates to about 3,000dwellings if no secondary connection is provided based on the PB report.

Hence it is likely overall that the intersections would need to be upgraded prior to full occupation of Precinct 3 assuming it will be similar size to Precinct 2. This assumption is made on the basis that a secondary access would not be available until Precinct 4 for which planning would occur during the

development of Precinct 3. It would be assumed that a secondary connection would be provided prior to full occupation of Precinct 3b and beyond. The analysis generally indicates intersections will need upgrading by 46% of the occupation of Precinct 3 (700 dwellings in addition to the 705 Precinct 3a dwellings). The above assumes Precinct 2 and 3a is complete and occupied.

Given the above, the timing of intersection upgrades is shown in Table 6.5.

Table 6.5: Intersection Upgrade Timing

Intsn.	Initial	Ultimate
3	Precinct 3a and up to 185 additional dwellings	From 800 dwellings provided within of future Precinct 3 and beyond complete and occupied
5	Initial and Ultimate will be the same signalised intersection	
6	Initial and Ultimate will be the same unsignalised intersection	

7 CONCLUSIONS

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

1. The proposed Precinct 3a development is located on the south-western corner of Precinct 2. It will be developed with a modified grid network and key access routes to Riverlea Boulevard and connection to local streets in Precinct 2.
2. Precinct 3a comprises 738 dwellings (low and medium density) which will result in approximately 5,904 trips per day and approximately 627 trips per hour during the peak hours.
3. For the purposes of this assessment, the anticipated traffic demands from the west as applied in the 2015 assessment as determined by '*Buckland Park Traffic Impact Assessment*' (Parsons Brinckerhoff Australia Pty Ltd, 1 April 2009) were reviewed. The peak hour volumes would translate to approximately 650 additional dwellings from future precincts of the development to the west. Based on current forecast yields of Precinct 3, these additional volumes and Precinct 3a dwelling numbers would account for approximately 46% of future Precinct 3 dwellings.
4. A review of the proposed intersections on Riverlea Boulevard has identified the initial intersection layouts which will cater for Precinct 3a traffic demands, and ultimate intersection layouts which will cater for future traffic demands of Riverlea as it is developed to the west.
5. The analysis of the intersections in Precinct 2 indicates that in general, the as built/construction plans of the intersections can accommodate the Initial and Ultimate traffic volumes.
6. The configurations of the street network will be conducive to a low speed environment of less than 40km/h on the minor streets, and 50km/h on collector streets which will link to Riverlea Boulevard.

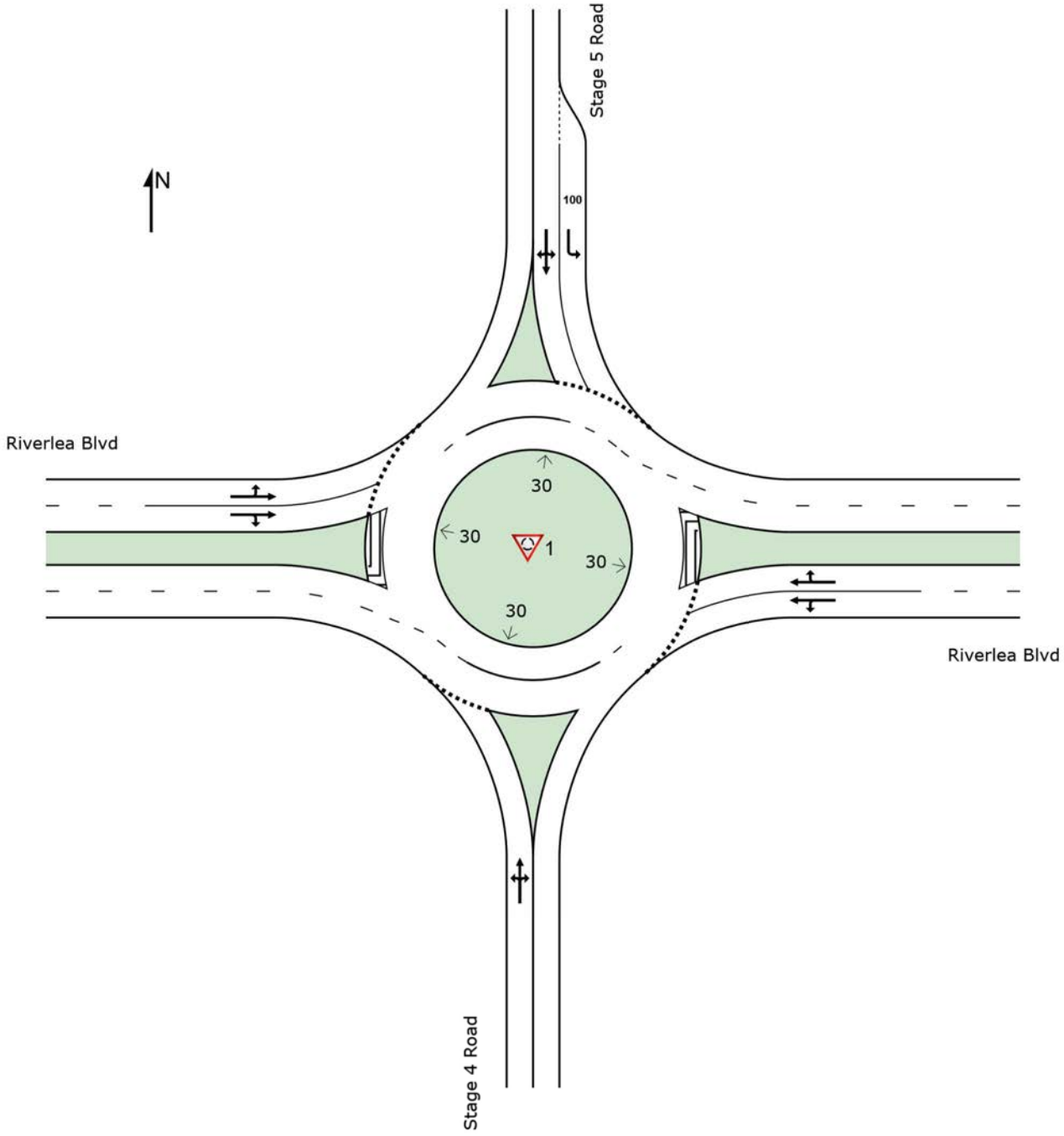
Appendix A Intersection 3 SIDRA Summary

SITE LAYOUT

Site: 1 [Prec2_Int3_Pre3a_AM (Site Folder: Precinct 3a)]

Intersection 3
Precinct 3 Volumes
AM Peak
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



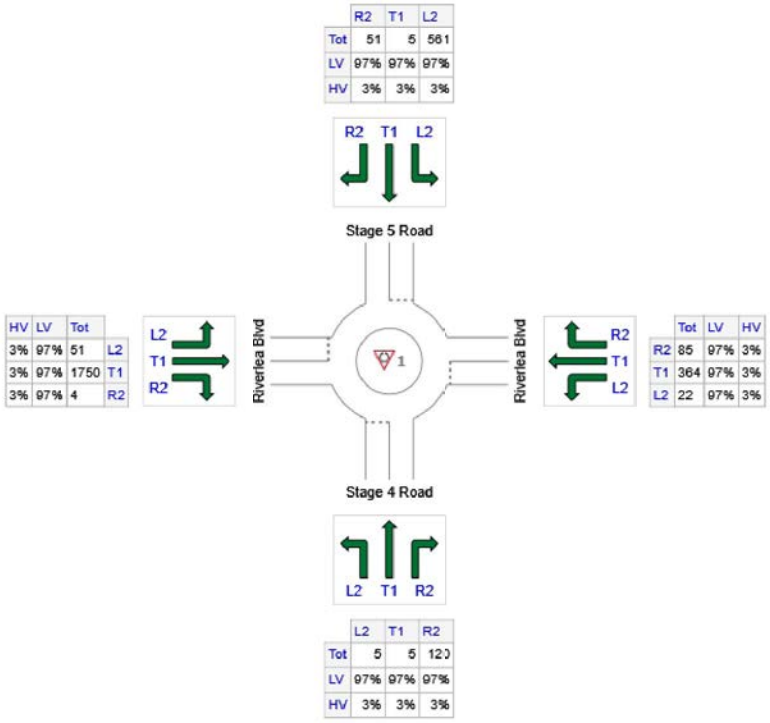
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 1 [Prec2_Int3_Pre3a_AM (Site Folder: Precinct 3a)]

Intersection 3
Precinct 3 Volumes
AM Peak
Site Category: (None)
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: Stage 4 Road	130	126	4
E: Riverlea Blvd	471	457	14
N: Stage 5 Road	617	598	19
W: Riverlea Blvd	1805	1751	54
Total	3023	2932	91

MOVEMENT SUMMARY

Site: 1 [Prec2_Int3_Pre3a_AM (Site Folder: Precinct 3a)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 3
Precinct 3 Volumes
AM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stage 4 Road															
1	L2	All MCs	5	3.0	5	3.0	0.172	4.6	LOS A	0.7	4.8	0.50	0.70	0.50	47.1
2	T1	All MCs	5	3.0	5	3.0	0.172	4.2	LOS A	0.7	4.8	0.50	0.70	0.50	44.4
3	R2	All MCs	126	3.0	126	3.0	0.172	9.8	LOS A	0.7	4.8	0.50	0.70	0.50	46.6
Approach			137	3.0	137	3.0	0.172	9.3	LOS A	0.7	4.8	0.50	0.70	0.50	46.6
East: Riverlea Blvd															
4	L2	All MCs	23	3.0	23	3.0	0.164	3.9	LOS A	1.1	8.0	0.23	0.35	0.23	50.5
5	T1	All MCs	383	3.0	383	3.0	0.164	3.7	LOS A	1.1	8.0	0.24	0.39	0.24	54.3
6	R2	All MCs	89	3.0	89	3.0	0.164	9.4	LOS A	1.1	7.7	0.25	0.47	0.25	48.9
Approach			496	3.0	496	3.0	0.164	4.7	LOS A	1.1	8.0	0.24	0.40	0.24	53.1
North: Stage 5 Road															
7	L2	All MCs	591	3.0	591	3.0	0.739	19.7	LOS B	6.4	46.1	0.95	1.18	1.58	39.0
8	T1	All MCs	5	3.0	5	3.0	0.739	21.5	LOS B	5.5	39.3	0.93	1.18	1.56	38.1
9	R2	All MCs	54	3.0	54	3.0	0.739	27.0	LOS B	5.5	39.3	0.93	1.18	1.56	39.7
Approach			649	3.0	649	3.0	0.739	20.3	LOS B	6.4	46.1	0.95	1.18	1.58	39.1
West: Riverlea Blvd															
10	L2	All MCs	54	3.0	54	3.0	0.708	5.4	LOS A	7.2	52.0	0.59	0.53	0.59	52.6
11	T1	All MCs	1842	3.0	1842	3.0	0.708	5.6	LOS A	7.4	52.8	0.61	0.56	0.63	53.0
12	R2	All MCs	4	3.0	4	3.0	0.708	11.9	LOS A	7.4	52.8	0.64	0.60	0.67	48.4
Approach			1900	3.0	1900	3.0	0.708	5.7	LOS A	7.4	52.8	0.61	0.56	0.63	53.0
All Vehicles			3182	3.0	3182	3.0	0.739	8.7	LOS A	7.4	52.8	0.62	0.67	0.76	49.2

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.
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.

Organisation: EMPIRICAL TRAFFIC ADVISORY PTY LTD | Licence: PLUS / 1PC | Processed: Tuesday, 30 September 2025 10:39:24 AM
Project: C:\Users\TimothyJones\Empirical Traffic Advisory\ETA - Documents\Projects\1000045_Riverlea\105_Precinct_3\Model\250930_1000045_Prec2_Int_3.sip9

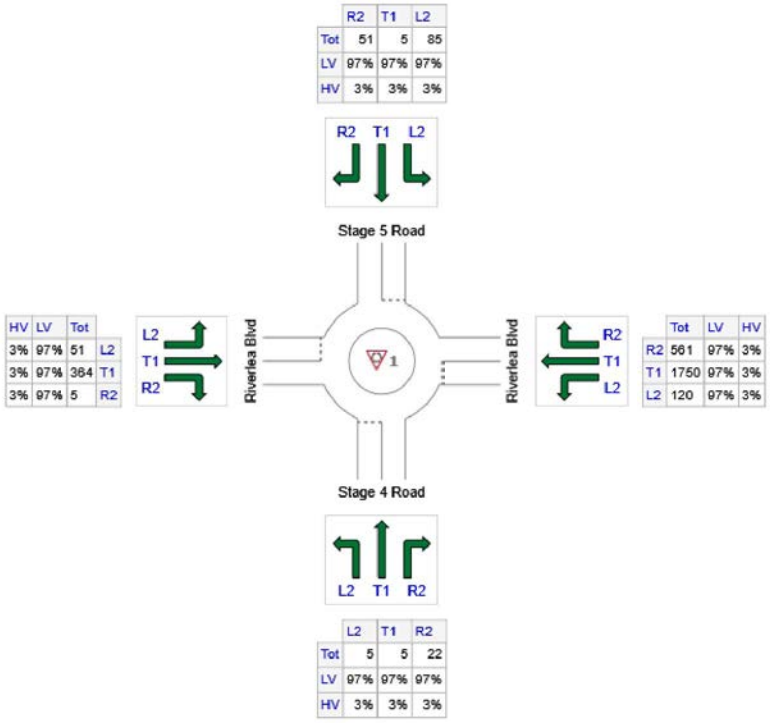
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 1 [Prec2_Int3_Pre3a_PM (Site Folder: Precinct 3a)]

Intersection 3
Precinct 3 Volumes
PM Peak
Site Category: (None)
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: Stage 4 Road	32	31	1
E: Riverlea Blvd	2431	2358	73
N: Stage 5 Road	141	137	4
W: Riverlea Blvd	420	407	13
Total	3024	2933	91

MOVEMENT SUMMARY

Site: 1 [Prec2_Int3_Pre3a_PM (Site Folder: Precinct 3a)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 3
Precinct 3 Volumes
PM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stage 4 Road															
1	L2	All MCs	5	3.0	5	3.0	0.144	16.2	LOS B	0.7	4.7	0.88	0.94	0.88	41.8
2	T1	All MCs	5	3.0	5	3.0	0.144	15.8	LOS B	0.7	4.7	0.88	0.94	0.88	39.6
3	R2	All MCs	23	3.0	23	3.0	0.144	21.3	LOS B	0.7	4.7	0.88	0.94	0.88	41.4
Approach			34	3.0	34	3.0	0.144	19.7	LOS B	0.7	4.7	0.88	0.94	0.88	41.2
East: Riverlea Blvd															
4	L2	All MCs	126	3.0	126	3.0	0.817	4.4	LOS A	15.2	109.5	0.53	0.40	0.53	49.3
5	T1	All MCs	1842	3.0	1842	3.0	0.817	4.3	LOS A	15.2	109.5	0.56	0.42	0.56	52.9
6	R2	All MCs	591	3.0	591	3.0	0.817	10.2	LOS A	14.4	103.3	0.62	0.49	0.62	47.5
Approach			2559	3.0	2559	3.0	0.817	5.7	LOS A	15.2	109.5	0.57	0.44	0.57	51.3
North: Stage 5 Road															
7	L2	All MCs	89	3.0	89	3.0	0.074	3.7	LOS A	0.3	2.3	0.44	0.52	0.44	46.4
8	T1	All MCs	5	3.0	5	3.0	0.074	3.2	LOS A	0.3	2.2	0.45	0.62	0.45	45.0
9	R2	All MCs	54	3.0	54	3.0	0.074	8.7	LOS A	0.3	2.2	0.45	0.62	0.45	47.3
Approach			148	3.0	148	3.0	0.074	5.5	LOS A	0.3	2.3	0.44	0.56	0.44	46.7
West: Riverlea Blvd															
10	L2	All MCs	54	3.0	54	3.0	0.242	6.5	LOS A	1.6	11.6	0.67	0.64	0.67	52.4
11	T1	All MCs	383	3.0	383	3.0	0.242	6.7	LOS A	1.6	11.6	0.67	0.66	0.67	52.7
12	R2	All MCs	5	3.0	5	3.0	0.242	12.9	LOS A	1.5	10.5	0.67	0.68	0.67	48.2
Approach			442	3.0	442	3.0	0.242	6.8	LOS A	1.6	11.6	0.67	0.66	0.67	52.6
All Vehicles			3183	3.0	3183	3.0	0.817	6.0	LOS A	15.2	109.5	0.58	0.48	0.58	51.1

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.
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.

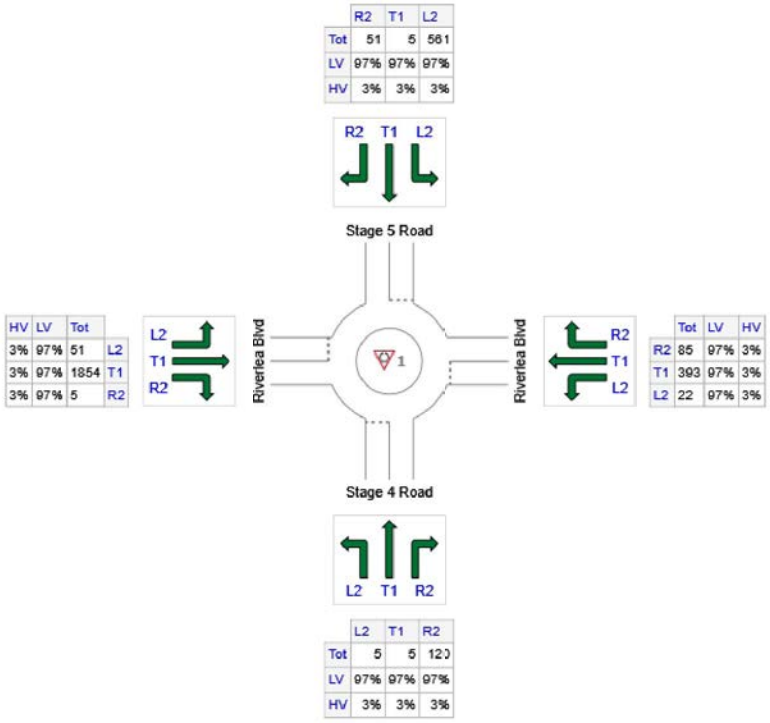
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 1 [Prec2_Int3_Pre3a_AM_Trigger (Site Folder: Precinct 3a)]

Intersection 3
Trigger Volumes
AM Peak
Site Category: (None)
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: Stage 4 Road	130	126	4
E: Riverlea Blvd	500	485	15
N: Stage 5 Road	617	598	19
W: Riverlea Blvd	1910	1853	57
Total	3157	3062	95

MOVEMENT SUMMARY

Site: 1 [Prec2_Int3_Pre3a_AM_Trigger (Site Folder: Precinct 3a)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 3
Trigger Volumes
AM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stage 4 Road															
1	L2	All MCs	5	3.0	5	3.0	0.175	4.7	LOS A	0.7	4.8	0.51	0.71	0.51	47.1
2	T1	All MCs	5	3.0	5	3.0	0.175	4.4	LOS A	0.7	4.8	0.51	0.71	0.51	44.4
3	R2	All MCs	126	3.0	126	3.0	0.175	9.9	LOS A	0.7	4.8	0.51	0.71	0.51	46.6
Approach			137	3.0	137	3.0	0.175	9.5	LOS A	0.7	4.8	0.51	0.71	0.51	46.5
East: Riverlea Blvd															
4	L2	All MCs	23	3.0	23	3.0	0.174	3.9	LOS A	1.2	8.6	0.24	0.35	0.24	50.5
5	T1	All MCs	414	3.0	414	3.0	0.174	3.7	LOS A	1.2	8.6	0.24	0.39	0.24	54.3
6	R2	All MCs	89	3.0	89	3.0	0.174	9.4	LOS A	1.2	8.3	0.25	0.46	0.25	49.0
Approach			526	3.0	526	3.0	0.174	4.7	LOS A	1.2	8.6	0.25	0.40	0.25	53.2
North: Stage 5 Road															
7	L2	All MCs	591	3.0	591	3.0	0.813	27.2	LOS B	8.1	57.9	0.98	1.30	1.89	36.1
8	T1	All MCs	5	3.0	5	3.0	0.813	29.8	LOS C	6.7	48.1	0.95	1.29	1.85	35.1
9	R2	All MCs	54	3.0	54	3.0	0.813	35.3	LOS C	6.7	48.1	0.95	1.29	1.85	36.5
Approach			649	3.0	649	3.0	0.813	27.9	LOS B	8.1	57.9	0.98	1.30	1.88	36.2
West: Riverlea Blvd															
10	L2	All MCs	54	3.0	54	3.0	0.749	5.9	LOS A	8.8	63.5	0.63	0.57	0.65	52.4
11	T1	All MCs	1952	3.0	1952	3.0	0.749	6.2	LOS A	8.9	64.0	0.65	0.60	0.69	52.8
12	R2	All MCs	5	3.0	5	3.0	0.749	12.5	LOS A	8.9	64.0	0.68	0.63	0.74	48.2
Approach			2011	3.0	2011	3.0	0.749	6.2	LOS A	8.9	64.0	0.65	0.60	0.69	52.8
All Vehicles			3323	3.0	3323	3.0	0.813	10.3	LOS A	8.9	64.0	0.64	0.71	0.85	48.3

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.
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.

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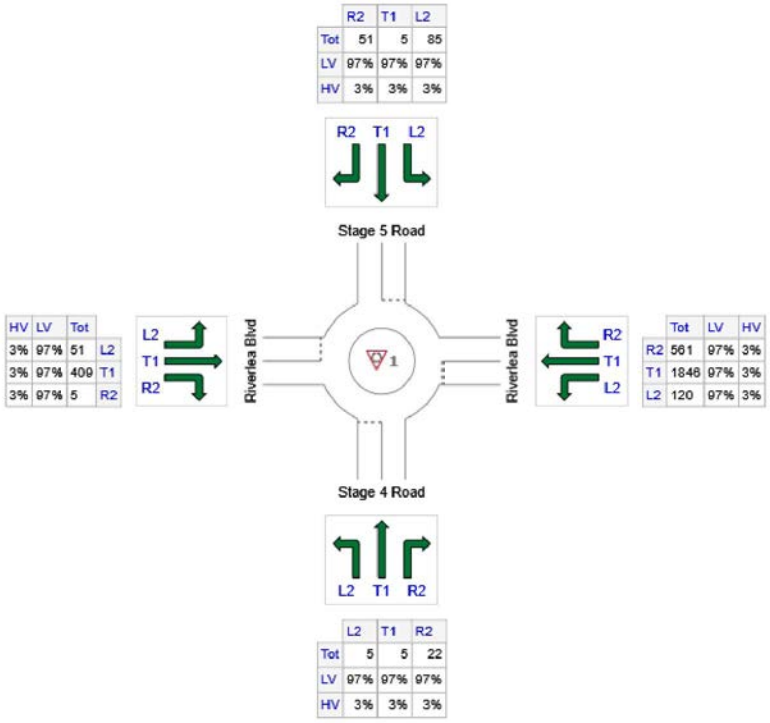
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 1 [Prec2_Int3_Pre3a_PM_Trigger (Site Folder: Precinct 3a)]

Intersection 3
Trigger Volumes
PM Peak
Site Category: (None)
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: Stage 4 Road	32	31	1
E: Riverlea Blvd	2527	2451	76
N: Stage 5 Road	141	137	4
W: Riverlea Blvd	465	451	14
Total	3165	3070	95

MOVEMENT SUMMARY

Site: 1 [Prec2_Int3_Pre3a_PM_Trigger (Site Folder: Precinct 3a)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 3
Trigger Volumes
PM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stage 4 Road															
1	L2	All MCs	5	3.0	5	3.0	0.168	18.4	LOS B	0.8	5.6	0.90	0.95	0.90	40.8
2	T1	All MCs	5	3.0	5	3.0	0.168	18.0	LOS B	0.8	5.6	0.90	0.95	0.90	38.7
3	R2	All MCs	23	3.0	23	3.0	0.168	23.5	LOS B	0.8	5.6	0.90	0.95	0.90	40.4
Approach			34	3.0	34	3.0	0.168	21.9	LOS B	0.8	5.6	0.90	0.95	0.90	40.2
East: Riverlea Blvd															
4	L2	All MCs	126	3.0	126	3.0	0.849	4.6	LOS A	18.3	131.7	0.58	0.40	0.58	49.0
5	T1	All MCs	1943	3.0	1943	3.0	0.849	4.5	LOS A	18.3	131.7	0.62	0.43	0.62	52.6
6	R2	All MCs	591	3.0	591	3.0	0.849	10.4	LOS A	17.2	123.5	0.70	0.48	0.70	47.3
Approach			2660	3.0	2660	3.0	0.849	5.8	LOS A	18.3	131.7	0.64	0.44	0.64	51.1
North: Stage 5 Road															
7	L2	All MCs	89	3.0	89	3.0	0.076	3.8	LOS A	0.3	2.3	0.46	0.54	0.46	46.3
8	T1	All MCs	5	3.0	5	3.0	0.076	3.4	LOS A	0.3	2.3	0.47	0.63	0.47	45.0
9	R2	All MCs	54	3.0	54	3.0	0.076	8.9	LOS A	0.3	2.3	0.47	0.63	0.47	47.2
Approach			148	3.0	148	3.0	0.076	5.6	LOS A	0.3	2.3	0.47	0.57	0.47	46.6
West: Riverlea Blvd															
10	L2	All MCs	54	3.0	54	3.0	0.273	6.6	LOS A	1.9	13.5	0.69	0.65	0.69	52.3
11	T1	All MCs	431	3.0	431	3.0	0.273	6.8	LOS A	1.9	13.5	0.69	0.67	0.69	52.7
12	R2	All MCs	5	3.0	5	3.0	0.273	12.9	LOS A	1.7	12.2	0.69	0.69	0.69	48.2
Approach			489	3.0	489	3.0	0.273	6.9	LOS A	1.9	13.5	0.69	0.67	0.69	52.6
All Vehicles			3332	3.0	3332	3.0	0.849	6.1	LOS A	18.3	131.7	0.64	0.48	0.64	51.0

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.
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.

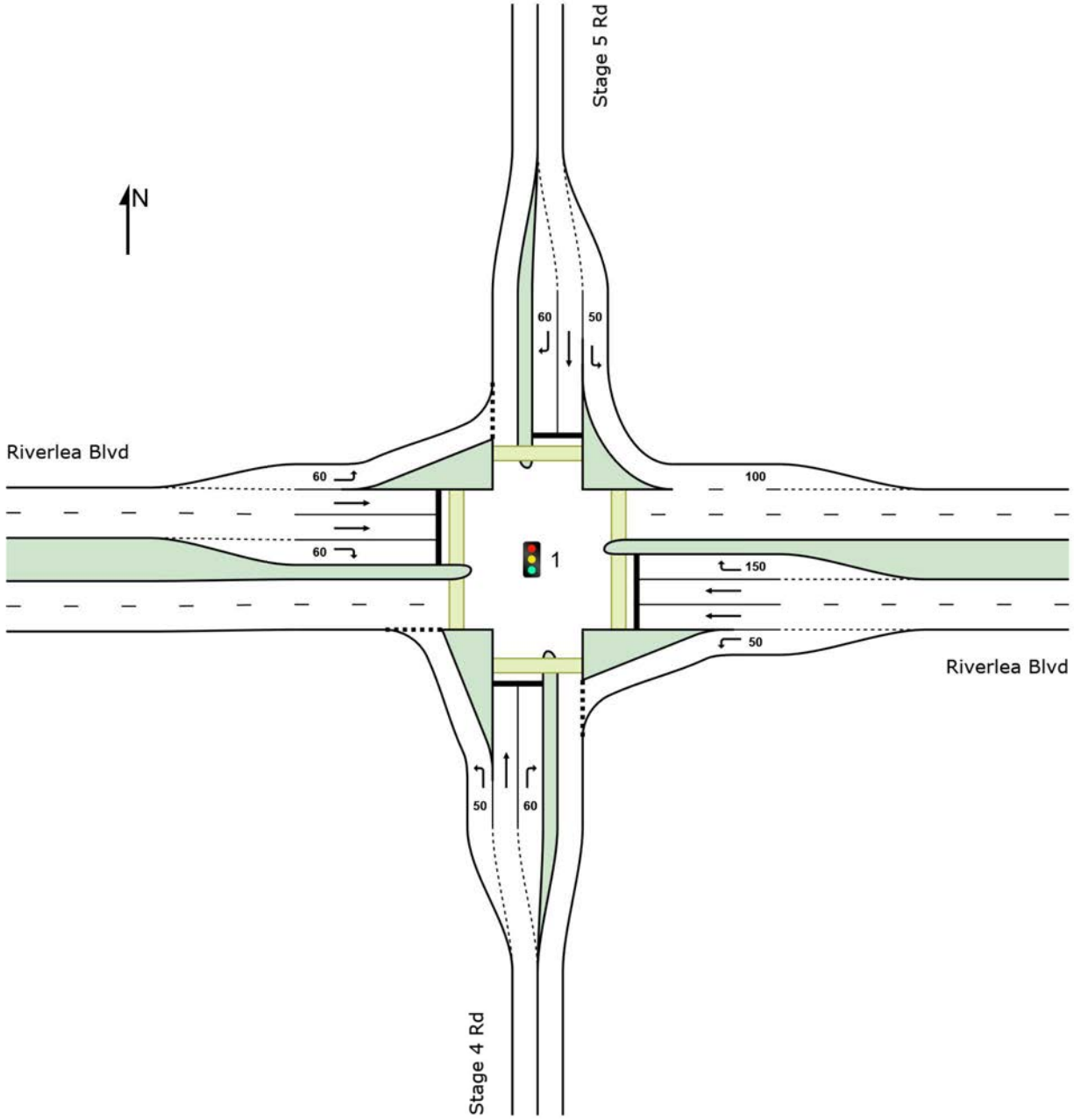
Organisation: EMPIRICAL TRAFFIC ADVISORY PTY LTD | Licence: PLUS / 1PC | Processed: Tuesday, 30 September 2025 10:38:47 AM
Project: C:\Users\TimothyJones\Empirical Traffic Advisory\ETA - Documents\Projects\1000045_Riverlea\105_Precinct_3\Model\250930_1000045_Prec2_Int_3.sip9

SITE LAYOUT

Site: 1 [Prec2_Int3_Pre3a_Ultimate-AM (Site Folder: Precinct 3a)]

Intersection 3
Ultimate Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



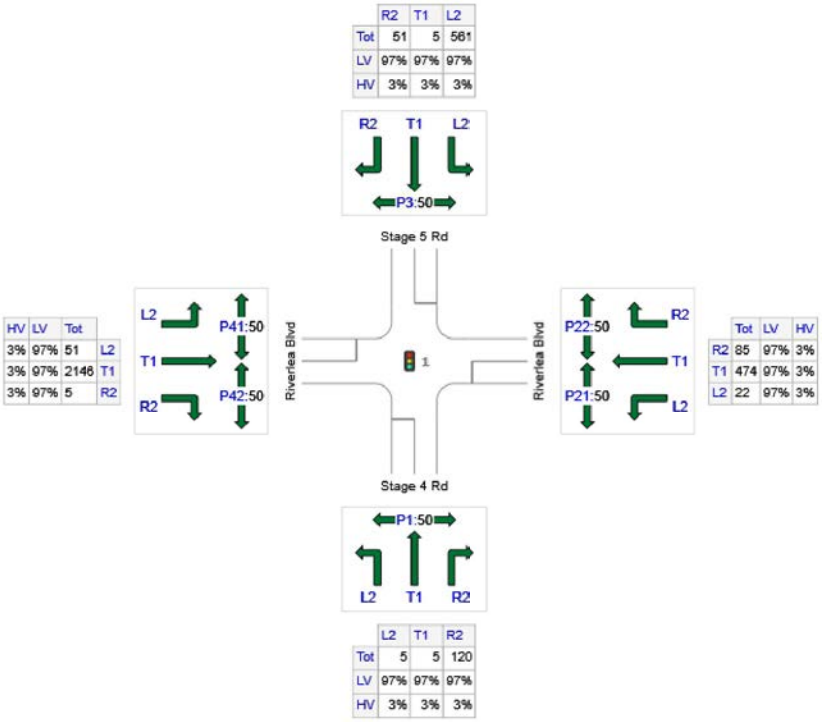
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 1 [Prec2_Int3_Pre3a_Ultimate-AM (Site Folder: Precinct 3a)]

Intersection 3
Ultimate Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: Stage 4 Rd	130	126	4
E: Riverlea Blvd	581	564	17
N: Stage 5 Rd	617	598	19
W: Riverlea Blvd	2202	2136	66
Total	3530	3424	106

PHASING SUMMARY

Site: 1 [Prec2_Int3_Pre3a_Ultimate-AM (Site Folder: Precinct 3a)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 3
Ultimate Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 150 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

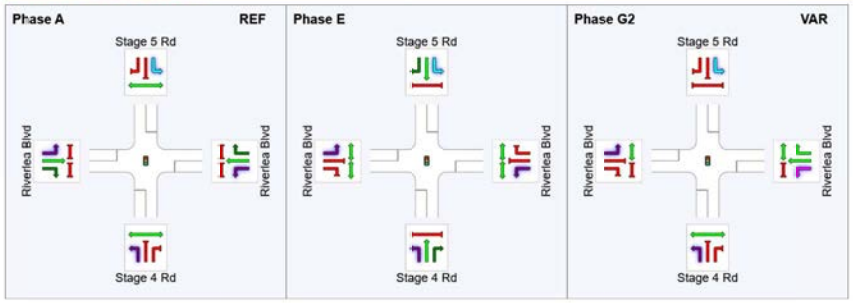
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: DDO - R Filter
Input Phase Sequence: A, D*, D1*, D2*, E, G*, G1*, G2*
Output Phase Sequence: A, E, G2*
Reference Phase: Phase A
(* Variable Phase)

Phase Timing Summary

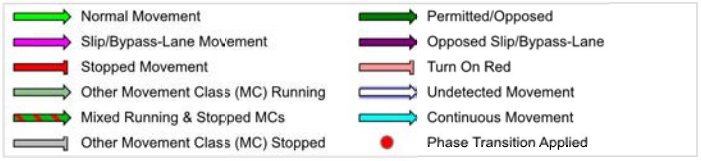
Phase	A	E	G2
Phase Change Time (sec)	0	113	136
Green Time (sec)	105	15	6
Phase Time (sec)	113	23	14
Phase Split	75%	15%	9%
Phase Frequency (%)	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



MOVEMENT SUMMARY

Site: 1 [Prec2_Int3_Pre3a_Ultimate-AM (Site Folder: Precinct 3a)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 3
Ultimate Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 150 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stage 4 Rd															
1	L2	All MCs	5	3.0	5	3.0	0.006	5.3	LOS A	0.0	0.2	0.14	0.52	0.14	48.9
2	T1	All MCs	5	3.0	5	3.0	0.027	65.7	LOS E	0.3	2.5	0.93	0.61	0.93	26.5
3	R2	All MCs	126	3.0	126	3.0	*0.802	82.9	LOS F	9.8	70.6	1.00	0.93	1.19	24.1
Approach			137	3.0	137	3.0	0.802	79.3	LOS F	9.8	70.6	0.96	0.90	1.14	24.7
East: Riverlea Blvd															
4	L2	All MCs	23	3.0	23	3.0	0.016	5.7	LOS A	0.0	0.1	0.02	0.55	0.02	49.4
5	T1	All MCs	499	3.0	499	3.0	0.163	0.3	LOS A	0.4	3.0	0.03	0.02	0.03	59.7
6	R2	All MCs	89	3.0	89	3.0	*0.634	18.3	LOS B	4.1	29.8	0.73	0.80	0.77	42.3
Approach			612	3.0	612	3.0	0.634	3.2	LOS A	4.1	29.8	0.13	0.16	0.13	55.9
North: Stage 5 Rd															
7	L2	All MCs	591	3.0	591	3.0	0.321	55.2	LOS D	0.0	0.0	0.00	0.46	0.00	46.3
8	T1	All MCs	5	3.0	5	3.0	0.027	65.7	LOS E	0.3	2.5	0.93	0.61	0.93	26.5
9	R2	All MCs	54	3.0	54	3.0	0.341	74.4	LOS F	3.8	27.1	0.97	0.76	0.97	25.5
Approach			649	3.0	649	3.0	0.341	56.9	LOS E	3.8	27.1	0.09	0.49	0.09	43.2
West: Riverlea Blvd															
10	L2	All MCs	54	3.0	54	3.0	0.060	15.8	LOS B	1.0	7.5	0.33	0.62	0.33	47.0
11	T1	All MCs	2259	3.0	2259	3.0	*0.846	3.9	LOS A	25.6	183.9	0.34	0.32	0.34	57.6
12	R2	All MCs	5	3.0	5	3.0	0.009	8.7	LOS A	0.0	0.2	0.07	0.56	0.07	48.4
Approach			2318	3.0	2318	3.0	0.846	4.2	LOS A	25.6	183.9	0.34	0.33	0.34	56.1
All Vehicles			3716	3.0	3716	3.0	0.846	16.0	LOS B	25.6	183.9	0.28	0.35	0.29	51.0

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Stage 4 Rd												
P1	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
East: Riverlea Blvd												
P21	Stage 1	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
P22	Stage 2	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
North: Stage 5 Rd												
P3	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
West: Riverlea Blvd												
P41	Stage 1	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
P42	Stage 2	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
All Pedestrians		300	316	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

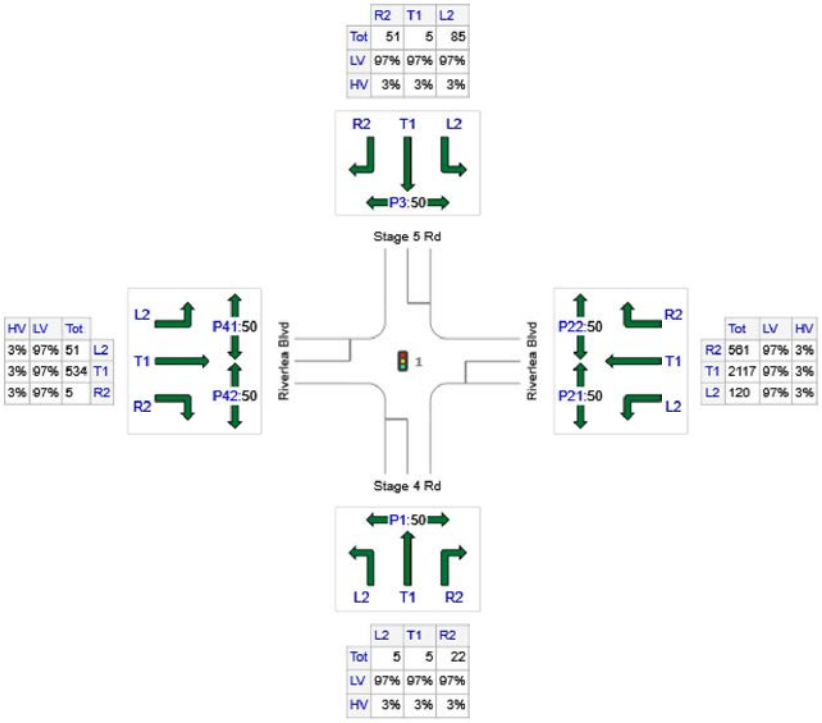
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 1 [Prec2_Int3_Pre3a_Ultimate-PM (Site Folder: Precinct 3a)]

Intersection 3
Ultimate Volumes
PM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: Stage 4 Rd	32	31	1
E: Riverlea Blvd	2798	2714	84
N: Stage 5 Rd	141	137	4
W: Riverlea Blvd	590	572	18
Total	3561	3454	107

PHASING SUMMARY

Site: 1 [Prec2_Int3_Pre3a_Ultimate-PM (Site Folder: Precinct 3a)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 3
Ultimate Volumes
PM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 150 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: DDO - R Filter
Input Phase Sequence: A, D*, D1*, D2*, E, G, G1*, G2*
Output Phase Sequence: A, E, G, G2*
Reference Phase: Phase A
(* Variable Phase)

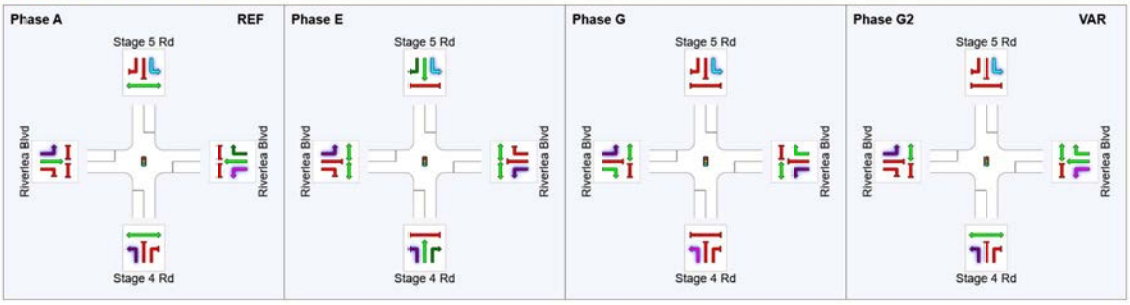
Phase Timing Summary

Phase	A	E	G	G2
Phase Change Time (sec)	0	107	125	139
Green Time (sec)	105	10	6	3
Phase Time (sec)	113	18	14	5
Phase Split	75%	12%	9%	3%
Phase Frequency (%)	100.0	100.0	100.0	25.4[3]

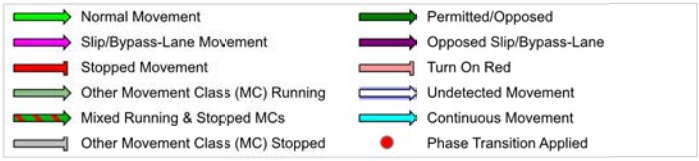
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

3 Phase Frequency has been estimated from actuated movement movement probabilities.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



MOVEMENT SUMMARY

Site: 1 [Prec2_Int3_Pre3a_Ultimate-PM (Site Folder: Precinct 3a)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 3
Ultimate Volumes
PM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 150 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stage 4 Rd															
1	L2	All MCs	5	3.0	5	3.0	0.017	6.1	LOS A	0.0	0.3	0.20	0.54	0.20	48.4
2	T1	All MCs	5	3.0	5	3.0	0.041	71.8	LOS F	0.4	2.6	0.96	0.63	0.96	25.4
3	R2	All MCs	23	3.0	23	3.0	0.207	78.8	LOS F	1.7	12.0	0.98	0.71	0.98	24.8
Approach			34	3.0	34	3.0	0.207	66.3	LOS E	1.7	12.0	0.85	0.67	0.85	26.9
East: Riverlea Blvd															
4	L2	All MCs	126	3.0	126	3.0	0.078	5.7	LOS A	0.1	0.7	0.02	0.55	0.02	49.3
5	T1	All MCs	2228	3.0	2228	3.0	* 0.786	0.6	LOS A	7.7	55.4	0.11	0.10	0.11	59.4
6	R2	All MCs	591	3.0	591	3.0	0.751	5.8	LOS A	1.8	12.8	0.05	0.56	0.05	49.3
Approach			2945	3.0	2945	3.0	0.786	1.8	LOS A	7.7	55.4	0.09	0.21	0.09	56.6
North: Stage 5 Rd															
7	L2	All MCs	89	3.0	89	3.0	0.049	4.9	LOS A	0.0	0.0	0.00	0.47	0.00	46.4
8	T1	All MCs	5	3.0	5	3.0	0.041	71.8	LOS F	0.4	2.6	0.96	0.63	0.96	25.4
9	R2	All MCs	54	3.0	54	3.0	* 0.479	80.9	LOS F	4.0	28.6	1.00	0.76	1.00	24.4
Approach			148	3.0	148	3.0	0.479	34.8	LOS C	4.0	28.6	0.40	0.58	0.40	34.3
West: Riverlea Blvd															
10	L2	All MCs	54	3.0	54	3.0	0.059	5.7	LOS A	0.1	0.5	0.02	0.55	0.02	53.0
11	T1	All MCs	562	3.0	562	3.0	0.208	1.6	LOS A	1.7	11.9	0.09	0.08	0.09	58.4
12	R2	All MCs	5	3.0	5	3.0	* 0.072	82.7	LOS F	0.4	2.8	0.97	0.65	0.97	24.3
Approach			621	3.0	621	3.0	0.208	2.7	LOS A	1.7	11.9	0.09	0.12	0.09	57.2
All Vehicles			3748	3.0	3748	3.0	0.786	3.9	LOS A	7.7	55.4	0.11	0.22	0.11	54.7

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Stage 4 Rd												
P1	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
East: Riverlea Blvd												
P21	Stage 1	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
P22	Stage 2	50	53	48.5	LOS E	0.2	0.2	0.92	0.92	63.9	20.0	0.31
North: Stage 5 Rd												
P3	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
West: Riverlea Blvd												
P41	Stage 1	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
P42	Stage 2	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
All Pedestrians		300	316	65.8	LOS F	0.2	0.2	0.96	0.96	81.2	20.0	0.25

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

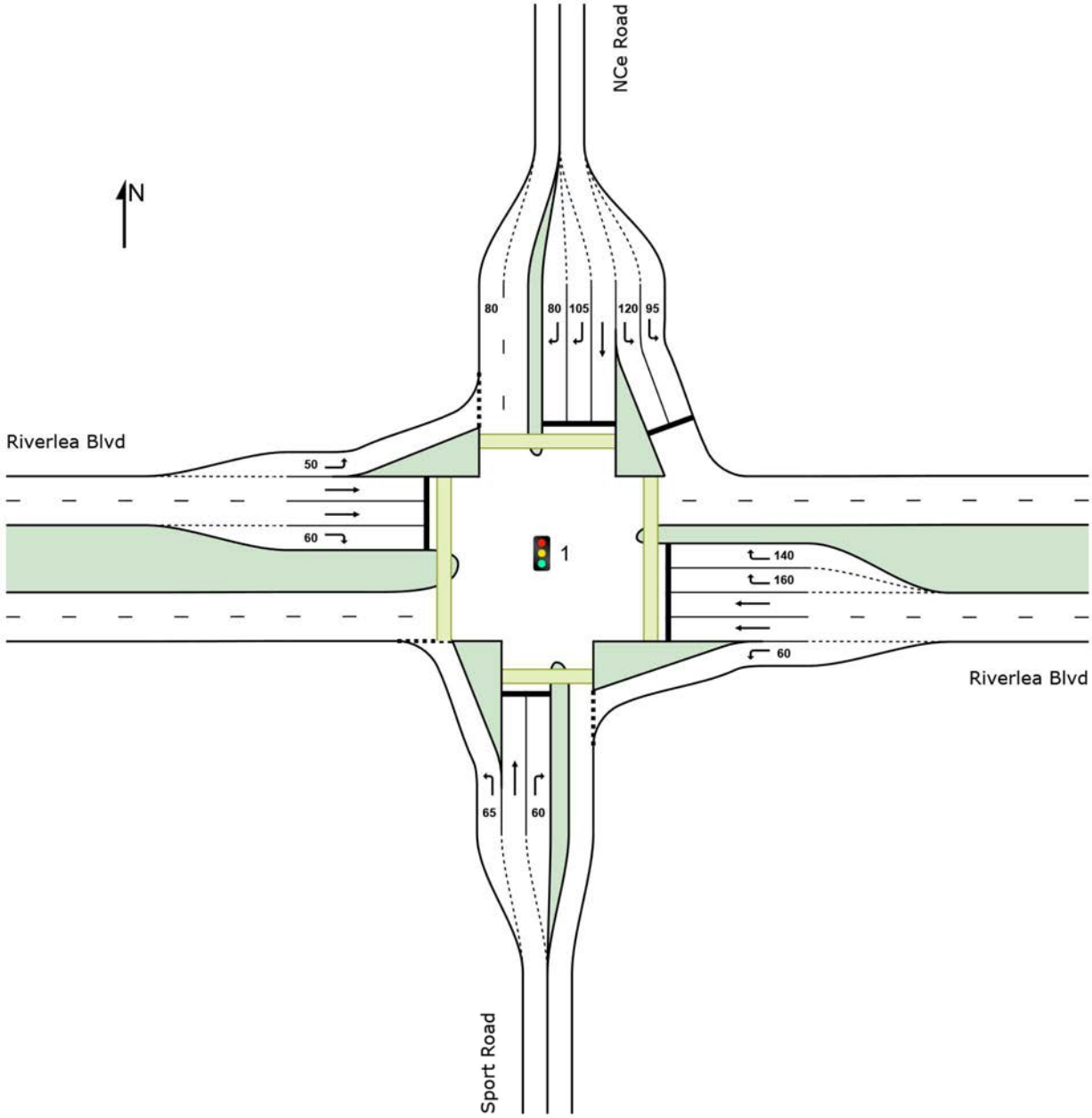
Appendix B Intersection 5 SIDRA Summary

SITE LAYOUT

Site: 1 [Prec2_Int_5_Pre3a_AM_Signals-Pre3a (Site Folder: Precinct 3a)]

Intersection 5
Precinct 3 Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



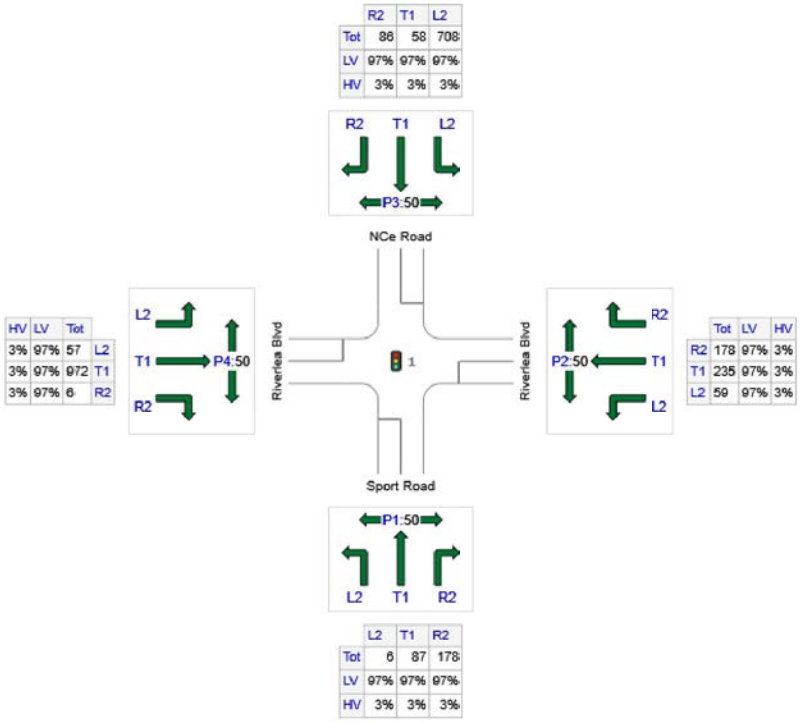
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 1 [Prec2_Int_5_Pre3a_AM_Signals-Pre3a (Site Folder: Precinct 3a)]

Intersection 5
Precinct 3 Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: Sport Road	271	263	8
E: Riverlea Blvd	472	458	14
N: NCe Road	852	826	26
W: Riverlea Blvd	1035	1004	31
Total	2630	2551	79

PHASING SUMMARY

Site: 1 [Prec2_Int_5_Pre3a_AM_Signals-Pre3a (Site Folder: Precinct 3a)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 5
Precinct 3 Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

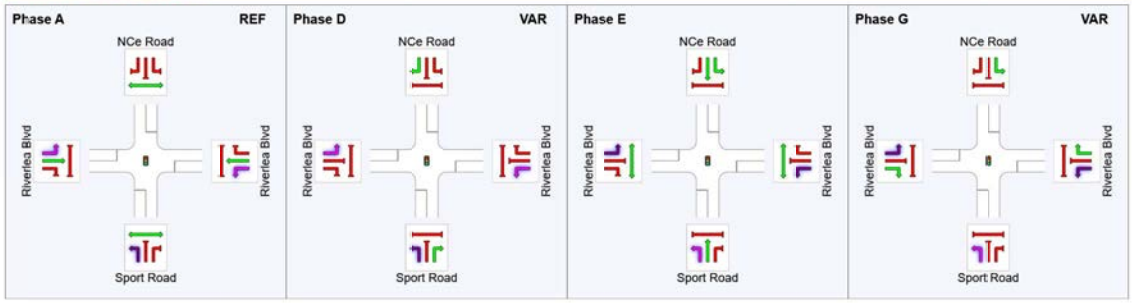
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: DDO
Input Phase Sequence: A, D*, D1*, D2*, E, G*, G1*, G2*
Output Phase Sequence: A, D*, E, G*
Reference Phase: Phase A
(* Variable Phase)

Phase Timing Summary

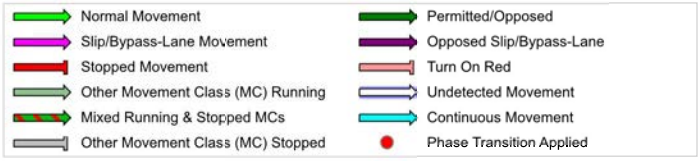
Phase	A	D	E	G
Phase Change Time (sec)	0	48	71	102
Green Time (sec)	40	15	23	10
Phase Time (sec)	48	23	31	18
Phase Split	40%	19%	26%	15%
Phase Frequency (%)	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



MOVEMENT SUMMARY

Site: 1 [Prec2_Int_5_Pre3a_AM_Signals-Pre3a (Site Folder: Precinct 3a)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 5
Precinct 3 Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Sport Road															
1	L2	All MCs	6	3.0	6	3.0	0.005	5.9	LOS A	0.0	0.3	0.21	0.53	0.21	48.5
2	T1	All MCs	92	3.0	92	3.0	*0.247	44.6	LOS D	4.6	33.0	0.89	0.70	0.89	31.2
3	R2	All MCs	187	3.0	187	3.0	*0.816	66.0	LOS E	11.7	84.3	1.00	0.95	1.19	27.2
Approach			285	3.0	285	3.0	0.816	57.8	LOS E	11.7	84.3	0.95	0.86	1.08	28.6
East: Riverlea Blvd															
4	L2	All MCs	62	3.0	62	3.0	0.042	6.5	LOS A	0.3	2.5	0.17	0.59	0.17	48.8
5	T1	All MCs	247	3.0	247	3.0	0.192	30.4	LOS C	5.1	36.8	0.75	0.61	0.75	40.2
6	R2	All MCs	187	3.0	187	3.0	*0.805	68.5	LOS E	7.8	56.2	1.00	0.87	1.15	26.9
Approach			497	3.0	497	3.0	0.805	41.8	LOS C	7.8	56.2	0.77	0.70	0.83	34.6
North: NCe Road															
7	L2	All MCs	745	3.0	745	3.0	0.594	39.6	LOS C	18.0	129.7	0.88	0.83	0.88	32.1
8	T1	All MCs	61	3.0	61	3.0	0.165	43.7	LOS D	3.0	21.6	0.87	0.67	0.87	31.5
9	R2	All MCs	91	3.0	91	3.0	0.197	56.2	LOS D	2.4	17.5	0.93	0.73	0.93	29.3
Approach			897	3.0	897	3.0	0.594	41.5	LOS C	18.0	129.7	0.89	0.81	0.89	31.7
West: Riverlea Blvd															
10	L2	All MCs	60	3.0	60	3.0	0.044	27.4	LOS B	0.6	4.4	0.25	0.61	0.25	51.4
11	T1	All MCs	1023	3.0	1023	3.0	*0.824	62.2	LOS E	30.0	216.6	0.99	0.93	1.06	35.2
12	R2	All MCs	6	3.0	6	3.0	0.041	79.1	LOS F	0.3	2.5	0.94	0.65	0.94	28.3
Approach			1089	3.0	1089	3.0	0.824	60.4	LOS E	30.0	216.6	0.95	0.91	1.02	30.3
All Vehicles			2768	3.0	2768	3.0	0.824	50.7	LOS D	30.0	216.6	0.90	0.83	0.95	31.3

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Sport Road												
P1	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29
East: Riverlea Blvd												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29
North: NCe Road												
P3	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29
West: Riverlea Blvd												
P4	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29
All Pedestrians		200	211	54.3	LOS E	0.2	0.2	0.95	0.95	69.7	20.0	0.29

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

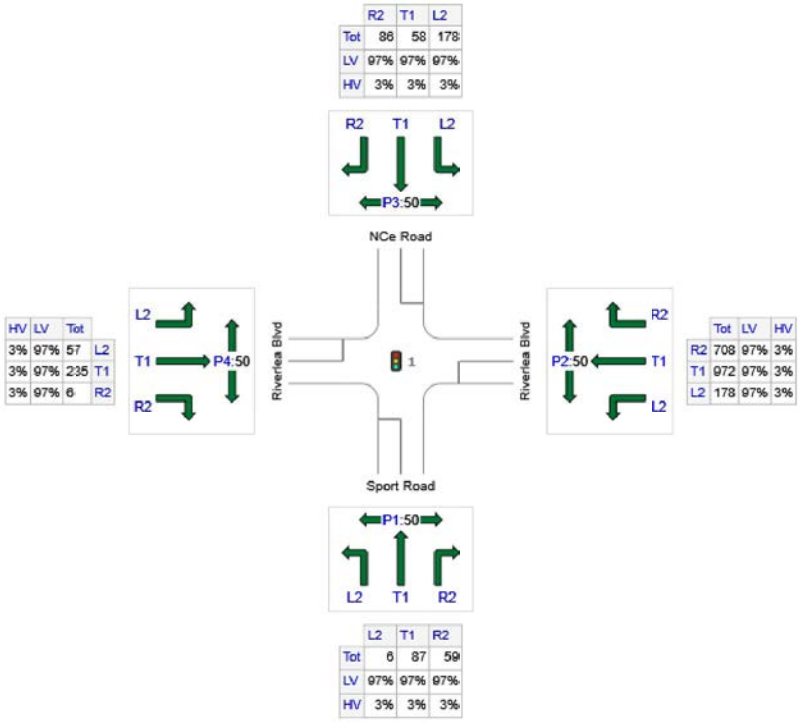
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 1 [Prec2_Int_5_Pre3a_PM_Signals-Pre3a (Site Folder: Precinct 3a)]

Intersection 5
Precinct 3 Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: Sport Road	152	147	5
E: Riverlea Blvd	1858	1802	56
N: NCe Road	322	312	10
W: Riverlea Blvd	298	289	9
Total	2630	2551	79

PHASING SUMMARY

Site: 1 [Prec2_Int_5_Pre3a_PM_Signals-Pre3a (Site Folder: Precinct 3a)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 5
Precinct 3 Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

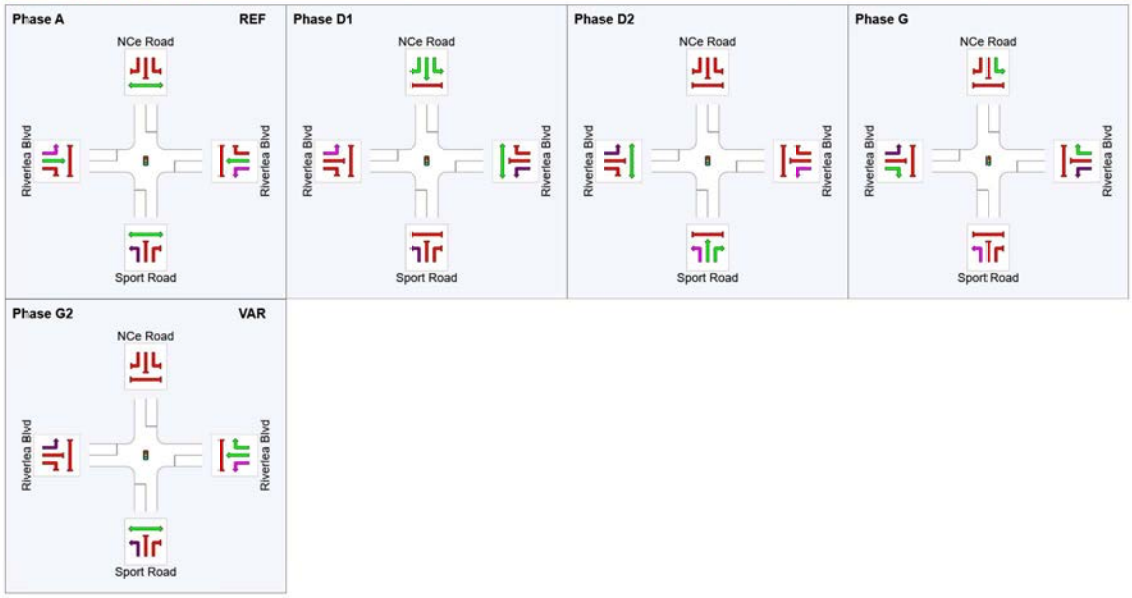
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: SDO
Input Phase Sequence: A, D1, D2, G, G1*, G2*
Output Phase Sequence: A, D1, D2, G, G2*
Reference Phase: Phase A
(* Variable Phase)

Phase Timing Summary

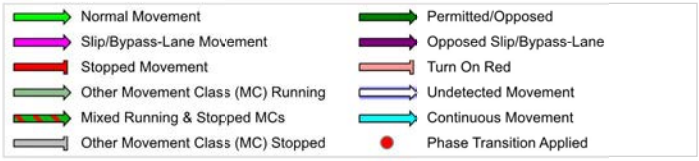
Phase	A	D1	D2	G	G2
Phase Change Time (sec)	0	25	54	83	97
Green Time (sec)	17	21	21	6	25
Phase Time (sec)	25	29	29	14	33
Phase Split	19%	22%	22%	11%	25%
Phase Frequency (%)	100.0	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



MOVEMENT SUMMARY

Site: 1 [Prec2_Int_5_Pre3a_PM_Signals-Pre3a (Site Folder: Precinct 3a)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 5
Precinct 3 Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Sport Road															
1	L2	All MCs	6	3.0	6	3.0	0.006	12.3	LOS A	0.1	0.9	0.41	0.57	0.41	44.7
2	T1	All MCs	92	3.0	92	3.0	*0.293	52.2	LOS D	5.2	37.3	0.92	0.73	0.92	29.4
3	R2	All MCs	62	3.0	62	3.0	0.209	55.9	LOS D	3.5	24.9	0.91	0.74	0.91	29.4
Approach			160	3.0	160	3.0	0.293	52.0	LOS D	5.2	37.3	0.90	0.73	0.90	29.8
East: Riverlea Blvd															
4	L2	All MCs	187	3.0	187	3.0	0.123	20.0	LOS B	1.1	8.0	0.17	0.60	0.17	48.8
5	T1	All MCs	1023	3.0	1023	3.0	0.750	43.1	LOS D	30.3	218.7	0.93	0.83	0.93	37.5
6	R2	All MCs	745	3.0	745	3.0	*0.889	57.3	LOS E	33.7	242.9	0.95	0.92	1.06	29.3
Approach			1956	3.0	1956	3.0	0.889	46.3	LOS D	33.7	242.9	0.87	0.84	0.91	33.2
North: NCe Road															
7	L2	All MCs	187	3.0	187	3.0	*0.246	30.3	LOS C	3.2	23.2	0.87	0.75	0.87	34.9
8	T1	All MCs	61	3.0	61	3.0	0.196	51.2	LOS D	3.4	24.4	0.90	0.69	0.90	29.6
9	R2	All MCs	91	3.0	91	3.0	0.153	55.2	LOS D	2.5	17.9	0.90	0.73	0.90	29.5
Approach			339	3.0	339	3.0	0.246	40.7	LOS C	3.4	24.4	0.89	0.73	0.89	32.3
West: Riverlea Blvd															
10	L2	All MCs	60	3.0	60	3.0	0.060	15.1	LOS B	1.4	10.1	0.45	0.65	0.45	46.7
11	T1	All MCs	247	3.0	247	3.0	*0.489	57.7	LOS E	7.4	53.7	0.98	0.78	0.98	31.0
12	R2	All MCs	6	3.0	6	3.0	0.074	72.7	LOS F	0.4	2.9	0.98	0.65	0.98	26.1
Approach			314	3.0	314	3.0	0.489	49.9	LOS D	7.4	53.7	0.88	0.75	0.88	33.0
All Vehicles			2768	3.0	2768	3.0	0.889	46.4	LOS D	33.7	242.9	0.87	0.81	0.90	32.9

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Sport Road												
P1	Full	50	53	59.3	LOS E	0.2	0.2	0.96	0.96	74.7	20.0	0.27
East: Riverlea Blvd												
P2	Full	50	53	59.3	LOS E	0.2	0.2	0.96	0.96	74.7	20.0	0.27
North: NCe Road												
P3	Full	50	53	59.3	LOS E	0.2	0.2	0.96	0.96	74.7	20.0	0.27
West: Riverlea Blvd												
P4	Full	50	53	59.3	LOS E	0.2	0.2	0.96	0.96	74.7	20.0	0.27
All Pedestrians		200	211	59.3	LOS E	0.2	0.2	0.96	0.96	74.7	20.0	0.27

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

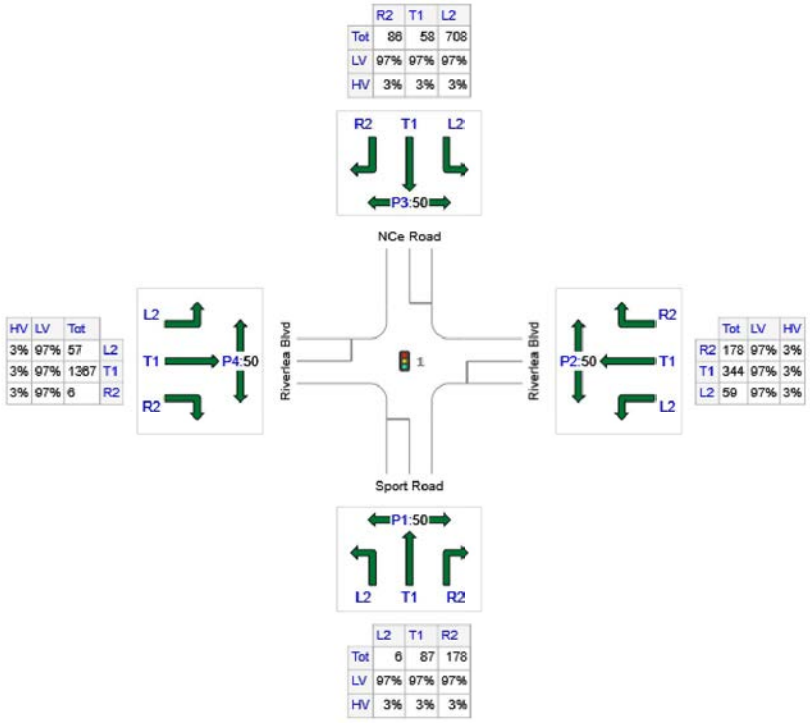
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 1 [Prec2_Int_5_Pre3a_AM_Signals-Ultimate (Site Folder: Precinct 3a)]

Intersection 5
Precinct 2 Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: Sport Road	271	263	8
E: Riverlea Blvd	581	564	17
N: NCe Road	852	826	26
W: Riverlea Blvd	1430	1387	43
Total	3134	3040	94

PHASING SUMMARY

Site: 1 [Prec2_Int_5_Pre3a_AM_Signals-Ultimate (Site Folder: Precinct 3a)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 5
Precinct 2 Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

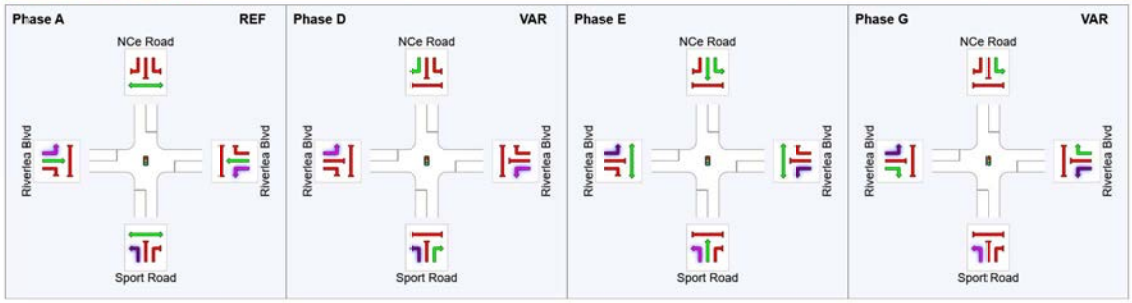
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: DDO
Input Phase Sequence: A, D*, D1*, D2*, E, G*, G1*, G2*
Output Phase Sequence: A, D*, E, G*
Reference Phase: Phase A
(* Variable Phase)

Phase Timing Summary

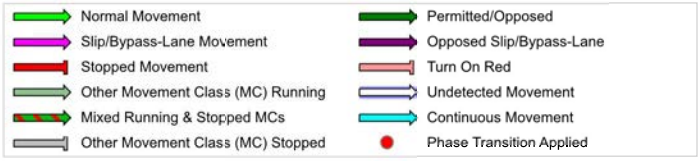
Phase	A	D	E	G
Phase Change Time (sec)	0	73	99	130
Green Time (sec)	55	18	23	12
Phase Time (sec)	73	26	31	20
Phase Split	49%	17%	21%	13%
Phase Frequency (%)	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



MOVEMENT SUMMARY

Site: 1 [Prec2_Int_5_Pre3a_AM_Signals-Ultimate (Site Folder: Precinct 3a)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 5
Precinct 2 Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Sport Road															
1	L2	All MCs	6	3.0	6	3.0	0.005	6.1	LOS A	0.1	0.4	0.19	0.53	0.19	48.3
2	T1	All MCs	92	3.0	92	3.0	*0.309	61.2	LOS E	6.0	43.3	0.93	0.73	0.93	27.4
3	R2	All MCs	187	3.0	187	3.0	*0.850	82.6	LOS F	14.7	106.0	1.00	0.96	1.20	24.2
Approach			285	3.0	285	3.0	0.850	74.1	LOS F	14.7	106.0	0.96	0.88	1.09	25.4
East: Riverlea Blvd															
4	L2	All MCs	62	3.0	62	3.0	0.040	6.4	LOS A	0.4	2.7	0.15	0.58	0.15	48.9
5	T1	All MCs	362	3.0	362	3.0	0.216	28.0	LOS B	8.1	58.5	0.66	0.56	0.66	41.3
6	R2	All MCs	187	3.0	187	3.0	*0.838	84.6	LOS F	9.7	70.3	1.00	0.88	1.15	24.1
Approach			612	3.0	612	3.0	0.838	43.1	LOS D	9.7	70.3	0.71	0.66	0.76	34.3
North: NCe Road															
7	L2	All MCs	745	3.0	745	3.0	0.756	60.1	LOS E	25.0	180.4	0.97	0.87	0.99	27.8
8	T1	All MCs	61	3.0	61	3.0	0.206	60.0	LOS E	3.9	28.3	0.91	0.70	0.91	27.6
9	R2	All MCs	91	3.0	91	3.0	0.205	69.4	LOS E	3.0	21.8	0.94	0.74	0.94	26.5
Approach			897	3.0	897	3.0	0.756	61.0	LOS E	25.0	180.4	0.97	0.84	0.98	27.2
West: Riverlea Blvd															
10	L2	All MCs	60	3.0	60	3.0	0.042	36.8	LOS C	0.7	5.3	0.23	0.60	0.23	51.3
11	T1	All MCs	1439	3.0	1439	3.0	*0.890	77.9	LOS F	53.7	387.1	1.00	0.97	1.08	33.3
12	R2	All MCs	6	3.0	6	3.0	0.043	102.9	LOS F	0.4	3.1	0.95	0.66	0.95	25.6
Approach			1505	3.0	1505	3.0	0.890	76.3	LOS F	53.7	387.1	0.97	0.96	1.04	26.8
All Vehicles			3299	3.0	3299	3.0	0.890	65.8	LOS E	53.7	387.1	0.92	0.86	0.98	27.9

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Sport Road												
P1	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
East: Riverlea Blvd												
P2	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
North: NCe Road												
P3	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
West: Riverlea Blvd												
P4	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
All Pedestrians		200	211	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

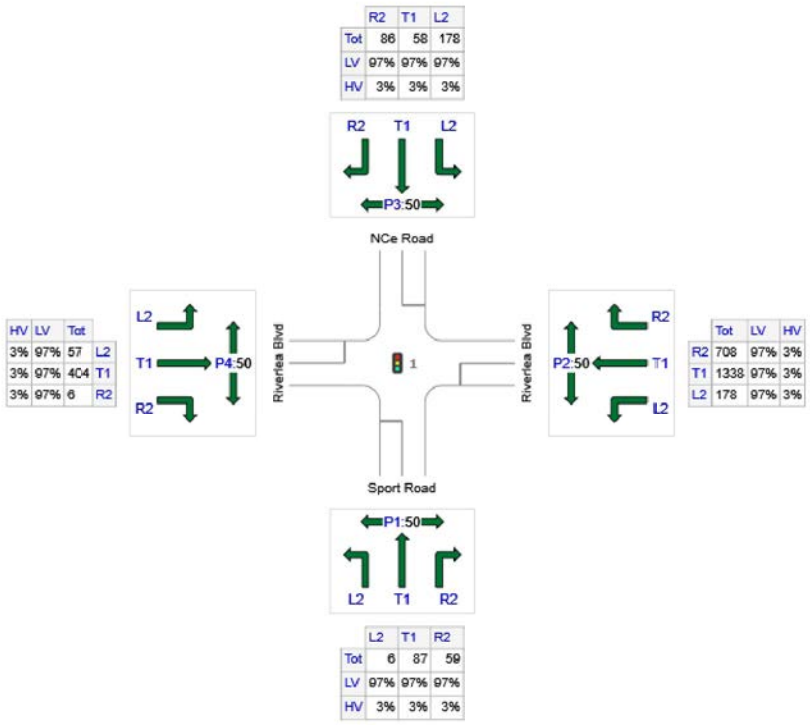
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 1 [Prec2_Int_5_Pre3a_PM_Signals-Ultimate (Site Folder: Precinct 3a)]

Intersection 5
Precinct 2 Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: Sport Road	152	147	5
E: Riverlea Blvd	2224	2157	67
N: NCe Road	322	312	10
W: Riverlea Blvd	467	453	14
Total	3165	3070	95

PHASING SUMMARY

Site: 1 [Prec2_Int_5_Pre3a_PM_Signals-Ultimate (Site Folder: Precinct 3a)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 5
Precinct 2 Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

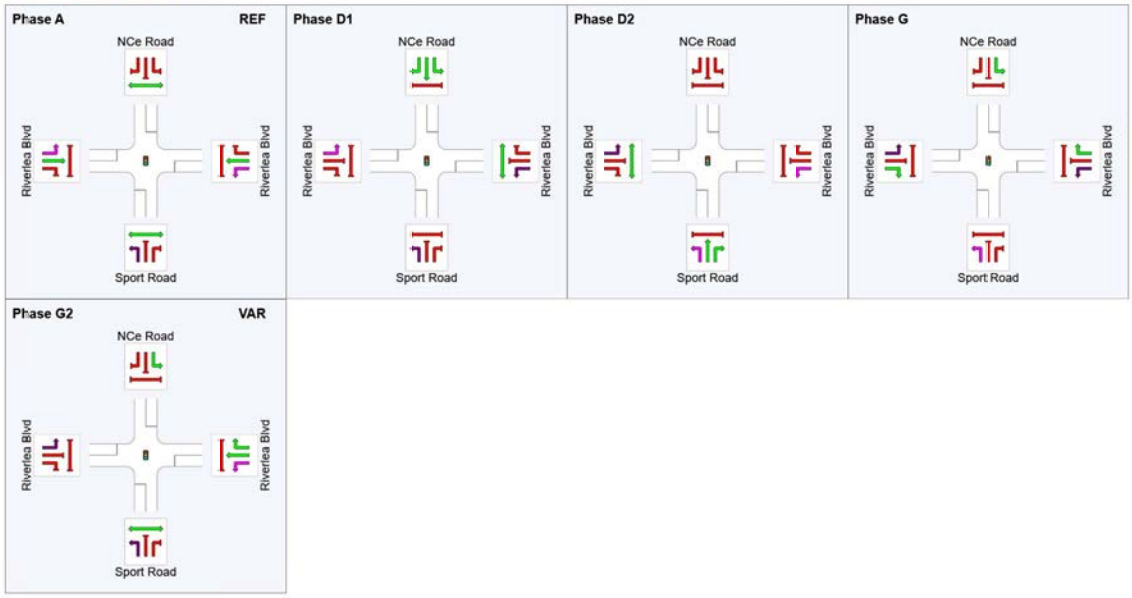
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: SDO
Input Phase Sequence: A, D1, D2, G, G1*, G2*
Output Phase Sequence: A, D1, D2, G, G2*
Reference Phase: Phase A
(* Variable Phase)

Phase Timing Summary

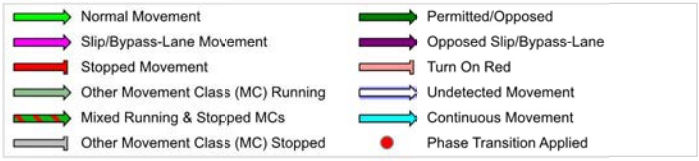
Phase	A	D1	D2	G	G2
Phase Change Time (sec)	0	31	60	89	103
Green Time (sec)	23	21	21	6	39
Phase Time (sec)	31	29	29	14	47
Phase Split	21%	19%	19%	9%	31%
Phase Frequency (%)	100.0	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



MOVEMENT SUMMARY

Site: 1 [Prec2_Int_5_Pre3a_PM_Signals-Ultimate (Site Folder: Precinct 3a)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 5
Precinct 2 Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Sport Road															
1	L2	All MCs	6	3.0	6	3.0	0.007	20.6	LOS B	0.2	1.5	0.52	0.59	0.52	40.6
2	T1	All MCs	92	3.0	92	3.0	*0.338	63.3	LOS E	6.1	44.1	0.95	0.74	0.95	27.0
3	R2	All MCs	62	3.0	62	3.0	0.241	66.9	LOS E	4.1	29.5	0.93	0.75	0.93	27.0
Approach			160	3.0	160	3.0	0.338	63.0	LOS E	6.1	44.1	0.92	0.74	0.92	27.3
East: Riverlea Blvd															
4	L2	All MCs	187	3.0	187	3.0	0.120	29.3	LOS C	1.2	8.7	0.16	0.59	0.16	48.9
5	T1	All MCs	1408	3.0	1408	3.0	*0.887	61.1	LOS E	53.2	383.8	0.98	0.96	1.06	34.1
6	R2	All MCs	745	3.0	745	3.0	0.755	51.2	LOS D	31.4	226.1	0.90	0.84	0.90	31.4
Approach			2341	3.0	2341	3.0	0.887	55.4	LOS D	53.2	383.8	0.89	0.89	0.94	30.9
North: NCe Road															
7	L2	All MCs	187	3.0	187	3.0	0.103	15.4	LOS B	1.9	13.7	0.56	0.66	0.56	40.6
8	T1	All MCs	61	3.0	61	3.0	*0.226	62.1	LOS E	4.0	28.8	0.93	0.71	0.93	27.2
9	R2	All MCs	91	3.0	91	3.0	0.176	66.1	LOS E	2.9	21.2	0.92	0.73	0.92	27.2
Approach			339	3.0	339	3.0	0.226	37.4	LOS C	4.0	28.8	0.72	0.69	0.72	33.3
West: Riverlea Blvd															
10	L2	All MCs	60	3.0	60	3.0	0.060	24.1	LOS B	1.5	10.8	0.42	0.65	0.42	46.8
11	T1	All MCs	425	3.0	425	3.0	0.738	73.4	LOS F	15.7	113.5	1.00	0.87	1.05	28.6
12	R2	All MCs	6	3.0	6	3.0	*0.086	86.5	LOS F	0.5	3.4	0.99	0.65	0.99	24.1
Approach			492	3.0	492	3.0	0.738	67.6	LOS E	15.7	113.5	0.93	0.84	0.97	28.6
All Vehicles			3332	3.0	3332	3.0	0.887	55.7	LOS D	53.2	383.8	0.88	0.86	0.92	30.5

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Sport Road												
P1	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
East: Riverlea Blvd												
P2	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
North: NCe Road												
P3	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
West: Riverlea Blvd												
P4	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
All Pedestrians		200	211	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

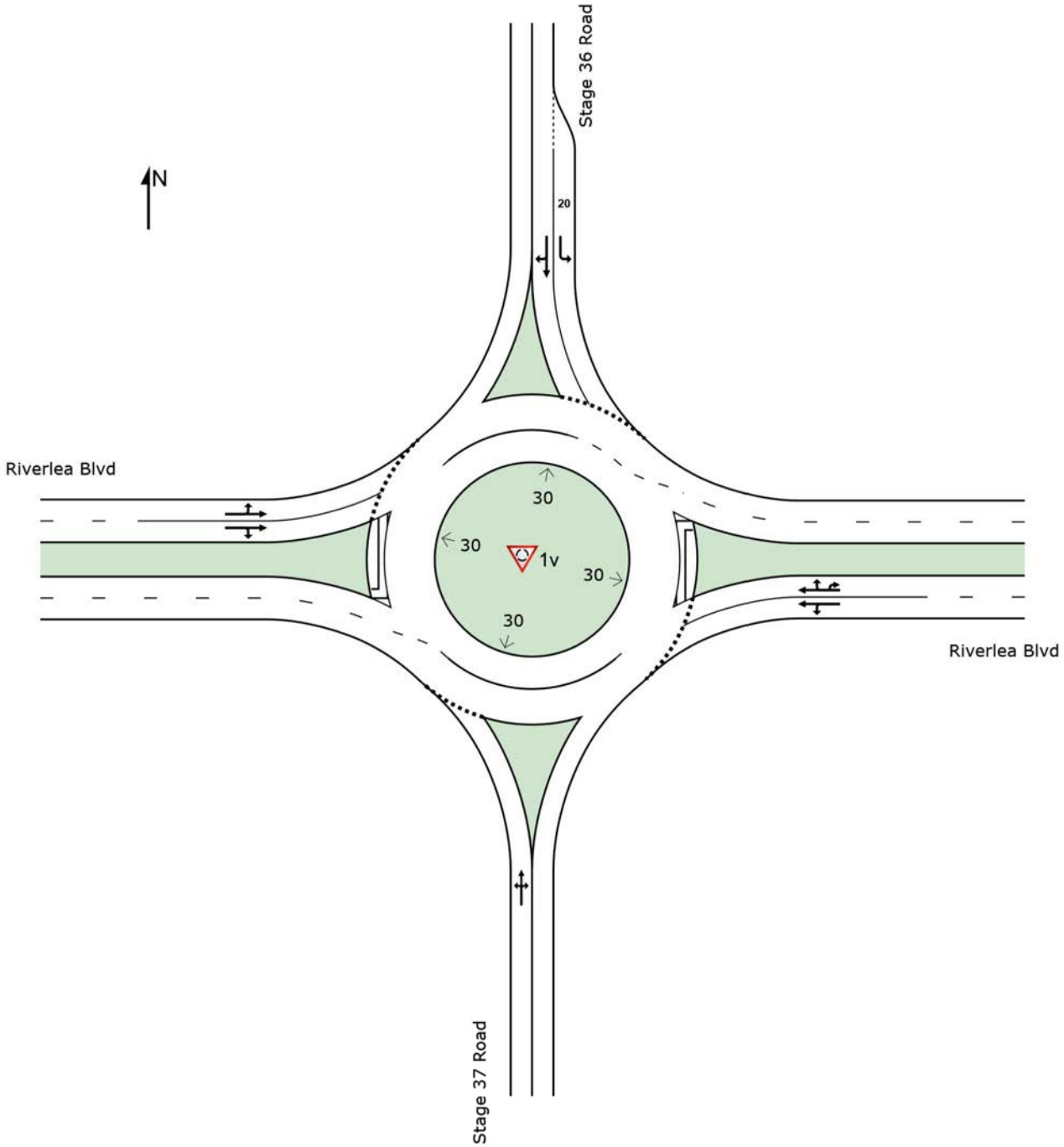
Appendix C Intersection 6 SIDRA Summary

SITE LAYOUT

Site: 1v [Prec2_Int_6-Pre3a-AM (Site Folder: Precinct 3a)]

Intersection 6
Precinct 3a Volumes
AM Peak
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



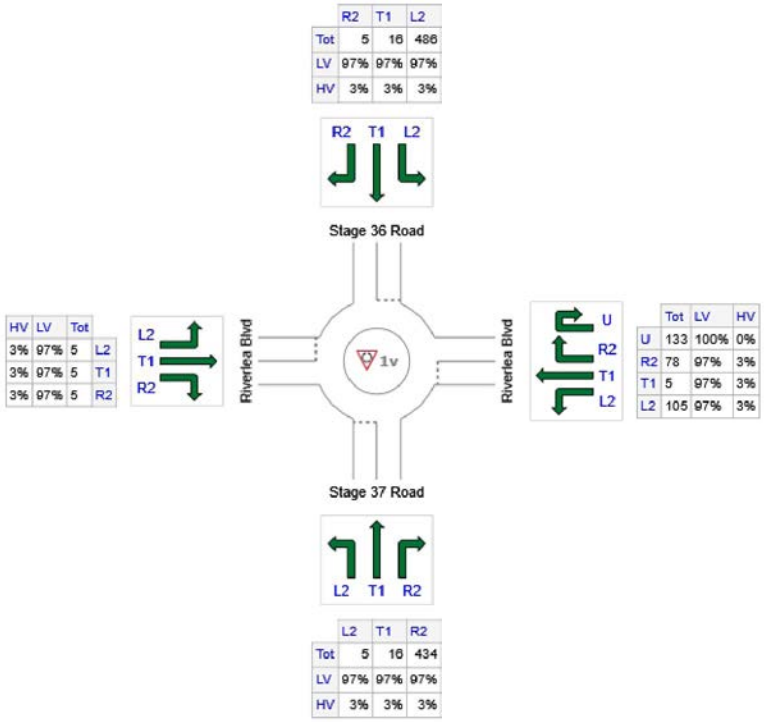
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 1v [Prec2_Int_6-Pre3a-AM (Site Folder: Precinct 3a)]

Intersection 6
Precinct 3a Volumes
AM Peak
Site Category: (None)
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: Stage 37 Road	455	441	14
E: Riverlea Blvd	321	315	6
N: Stage 36 Road	507	492	15
W: Riverlea Blvd	15	15	0
Total	1298	1263	35

MOVEMENT SUMMARY

Site: 1v [Prec2_Int_6-Pre3a-AM (Site Folder: Precinct 3a)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 6
Precinct 3a Volumes
AM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stage 37 Road															
1	L2	All MCs	5	3.0	5	3.0	0.485	5.4	LOS A	3.2	23.3	0.56	0.62	0.56	46.9
2	T1	All MCs	17	3.0	17	3.0	0.485	4.0	LOS A	3.2	23.3	0.56	0.62	0.56	44.2
3	R2	All MCs	457	3.0	457	3.0	0.485	9.5	LOS A	3.2	23.3	0.56	0.62	0.56	46.4
Approach			479	3.0	479	3.0	0.485	9.3	LOS A	3.2	23.3	0.56	0.62	0.56	46.3
East: Riverlea Blvd															
4	L2	All MCs	111	3.0	111	3.0	0.084	3.7	LOS A	0.5	3.8	0.15	0.41	0.15	50.9
5	T1	All MCs	5	3.0	5	3.0	0.084	3.6	LOS A	0.5	3.8	0.15	0.41	0.15	55.4
6	R2	All MCs	82	3.0	82	3.0	0.129	9.3	LOS A	0.9	6.2	0.14	0.62	0.14	46.6
6u	U	All MCs	140	0.0	140	0.0	0.129	11.6	LOS A	0.9	6.2	0.14	0.62	0.14	49.8
Approach			338	1.8	338	1.8	0.129	8.3	LOS A	0.9	6.2	0.15	0.55	0.15	49.4
North: Stage 36 Road															
7	L2	All MCs	512	3.0	512	3.0	0.602	8.9	LOS A	5.6	40.5	0.85	0.82	1.05	47.3
8	T1	All MCs	17	3.0	17	3.0	0.045	7.3	LOS A	0.2	1.5	0.65	0.67	0.65	45.4
9	R2	All MCs	5	3.0	5	3.0	0.045	14.5	LOS B	0.2	1.5	0.65	0.67	0.65	47.8
Approach			534	3.0	534	3.0	0.602	8.9	LOS A	5.6	40.5	0.84	0.81	1.04	47.2
West: Riverlea Blvd															
10	L2	All MCs	5	3.0	5	3.0	0.009	6.9	LOS A	0.1	0.5	0.72	0.54	0.72	52.5
11	T1	All MCs	5	3.0	5	3.0	0.009	7.0	LOS A	0.1	0.5	0.72	0.56	0.72	51.9
12	R2	All MCs	5	3.0	5	3.0	0.009	13.5	LOS A	0.1	0.4	0.72	0.63	0.72	48.9
Approach			16	3.0	16	3.0	0.009	9.1	LOS A	0.1	0.5	0.72	0.58	0.72	51.0
All Vehicles			1366	2.7	1366	2.7	0.602	8.9	LOS A	5.6	40.5	0.57	0.68	0.64	47.4

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.
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.

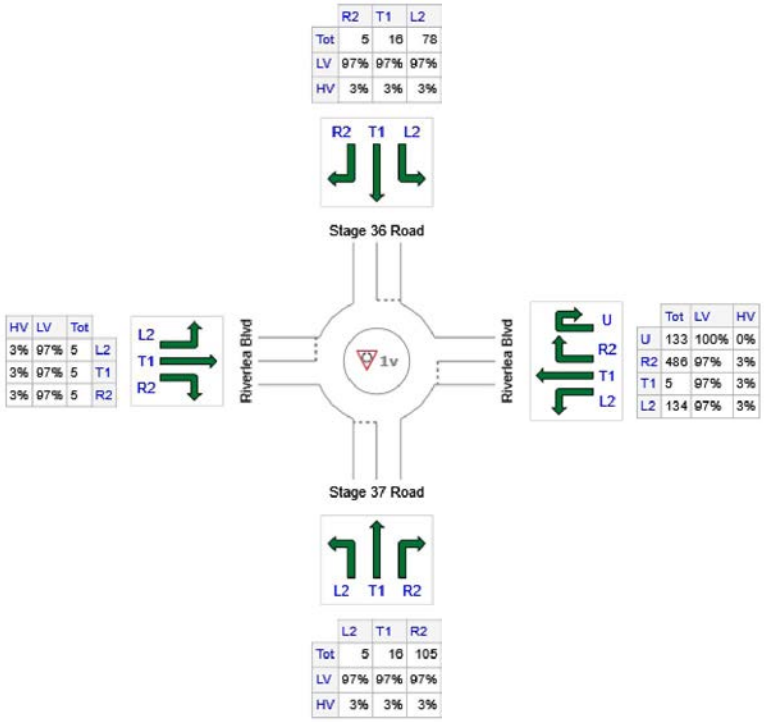
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 1v [Prec2_Int_6-Pre3a-PM (Site Folder: Precinct 3a)]

Intersection 6
Precinct 3a volumes
PM Peak
Site Category: (None)
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: Stage 37 Road	126	122	4
E: Riverlea Blvd	758	739	19
N: Stage 36 Road	99	96	3
W: Riverlea Blvd	15	15	0
Total	998	972	26

MOVEMENT SUMMARY

Site: 1v [Prec2_Int_6-Pre3a-PM (Site Folder: Precinct 3a)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 6
Precinct 3a volumes
PM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stage 37 Road															
1	L2	All MCs	5	3.0	5	3.0	0.200	8.1	LOS A	1.0	7.5	0.67	0.73	0.67	46.2
2	T1	All MCs	17	3.0	17	3.0	0.200	6.7	LOS A	1.0	7.5	0.67	0.73	0.67	43.6
3	R2	All MCs	111	3.0	111	3.0	0.200	12.2	LOS A	1.0	7.5	0.67	0.73	0.67	45.7
Approach			133	3.0	133	3.0	0.200	11.3	LOS A	1.0	7.5	0.67	0.73	0.67	45.4
East: Riverlea Blvd															
4	L2	All MCs	141	3.0	141	3.0	0.122	3.8	LOS A	0.8	5.4	0.16	0.42	0.16	50.8
5	T1	All MCs	5	3.0	5	3.0	0.122	3.6	LOS A	0.8	5.4	0.16	0.42	0.16	55.3
6	R2	All MCs	512	3.0	512	3.0	0.371	9.3	LOS A	3.1	22.3	0.17	0.59	0.17	47.0
6u	U	All MCs	140	0.0	140	0.0	0.371	11.6	LOS A	3.1	22.3	0.17	0.59	0.17	50.2
Approach			798	2.5	798	2.5	0.371	8.7	LOS A	3.1	22.3	0.17	0.56	0.17	48.2
North: Stage 36 Road															
7	L2	All MCs	82	3.0	82	3.0	0.075	3.6	LOS A	0.4	2.6	0.40	0.45	0.40	50.2
8	T1	All MCs	17	3.0	17	3.0	0.032	4.2	LOS A	0.1	1.0	0.45	0.49	0.45	46.8
9	R2	All MCs	5	3.0	5	3.0	0.032	11.4	LOS A	0.1	1.0	0.45	0.49	0.45	49.4
Approach			104	3.0	104	3.0	0.075	4.1	LOS A	0.4	2.6	0.42	0.45	0.42	49.6
West: Riverlea Blvd															
10	L2	All MCs	5	3.0	5	3.0	0.010	7.6	LOS A	0.1	0.5	0.72	0.55	0.72	52.1
11	T1	All MCs	5	3.0	5	3.0	0.010	7.8	LOS A	0.1	0.5	0.72	0.58	0.72	51.6
12	R2	All MCs	5	3.0	5	3.0	0.010	14.4	LOS A	0.1	0.4	0.73	0.64	0.73	48.4
Approach			16	3.0	16	3.0	0.010	9.9	LOS A	0.1	0.5	0.72	0.59	0.72	50.6
All Vehicles			1051	2.6	1051	2.6	0.371	8.6	LOS A	3.1	22.3	0.27	0.57	0.27	48.0

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.
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.

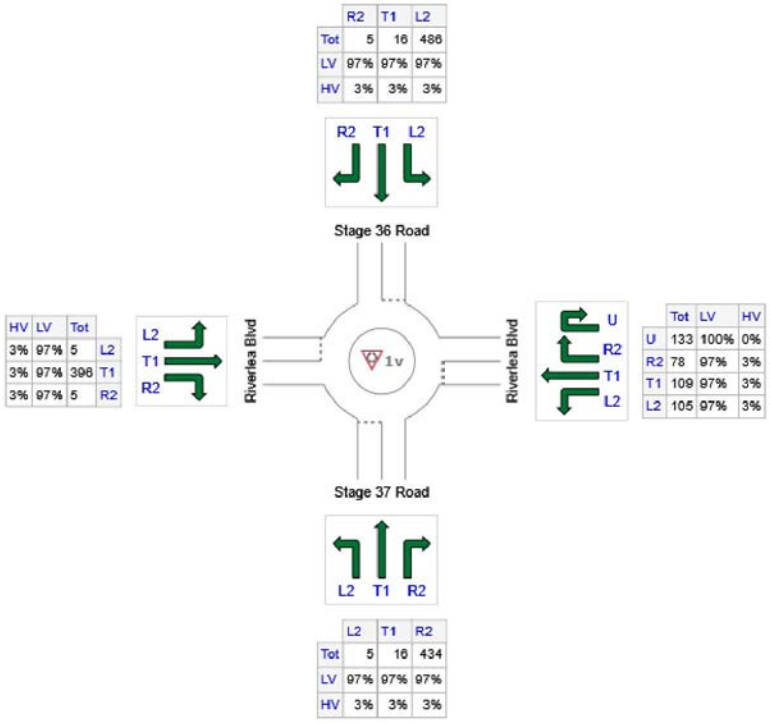
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 1v [Prec2_Int_6-Pre3a-Ultimate-AM (Site Folder: Precinct 3a)]

Intersection 6
Ultimate volumes
AM Peak
Site Category: (None)
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: Stage 37 Road	455	441	14
E: Riverlea Blvd	425	416	9
N: Stage 36 Road	507	492	15
W: Riverlea Blvd	406	394	12
Total	1793	1743	50

MOVEMENT SUMMARY

Site: 1v [Prec2_Int_6-Pre3a-Ultimate-AM (Site Folder: Precinct 3a)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 6
Ultimate volumes
AM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stage 37 Road															
1	L2	All MCs	5	3.0	5	3.0	0.545	7.0	LOS A	3.9	27.8	0.66	0.72	0.72	46.4
2	T1	All MCs	17	3.0	17	3.0	0.545	5.6	LOS A	3.9	27.8	0.66	0.72	0.72	43.7
3	R2	All MCs	457	3.0	457	3.0	0.545	11.1	LOS A	3.9	27.8	0.66	0.72	0.72	45.9
Approach			479	3.0	479	3.0	0.545	10.8	LOS A	3.9	27.8	0.66	0.72	0.72	45.8
East: Riverlea Blvd															
4	L2	All MCs	111	3.0	111	3.0	0.132	3.7	LOS A	0.9	6.5	0.15	0.37	0.15	50.9
5	T1	All MCs	115	3.0	115	3.0	0.132	3.5	LOS A	0.9	6.5	0.15	0.37	0.15	55.4
6	R2	All MCs	82	3.0	82	3.0	0.149	9.3	LOS A	1.0	7.2	0.16	0.62	0.16	46.6
6u	U	All MCs	140	0.0	140	0.0	0.149	11.6	LOS A	1.0	7.2	0.16	0.62	0.16	49.8
Approach			447	2.1	447	2.1	0.149	7.2	LOS A	1.0	7.2	0.15	0.49	0.15	50.7
North: Stage 36 Road															
7	L2	All MCs	512	3.0	512	3.0	0.728	14.0	LOS A	7.2	52.0	0.93	1.09	1.47	44.3
8	T1	All MCs	17	3.0	17	3.0	0.056	9.4	LOS A	0.2	1.7	0.71	0.78	0.71	44.3
9	R2	All MCs	5	3.0	5	3.0	0.056	16.6	LOS B	0.2	1.7	0.71	0.78	0.71	46.5
Approach			534	3.0	534	3.0	0.728	13.9	LOS A	7.2	52.0	0.92	1.07	1.44	44.4
West: Riverlea Blvd															
10	L2	All MCs	5	3.0	5	3.0	0.259	7.6	LOS A	2.0	14.3	0.81	0.65	0.81	51.6
11	T1	All MCs	417	3.0	417	3.0	0.259	8.1	LOS A	2.0	14.3	0.81	0.67	0.81	52.0
12	R2	All MCs	5	3.0	5	3.0	0.259	14.5	LOS A	1.8	12.9	0.81	0.69	0.81	51.0
Approach			427	3.0	427	3.0	0.259	8.1	LOS A	2.0	14.3	0.81	0.67	0.81	52.0
All Vehicles			1887	2.8	1887	2.8	0.728	10.2	LOS A	7.2	52.0	0.64	0.75	0.81	47.7

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.
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.

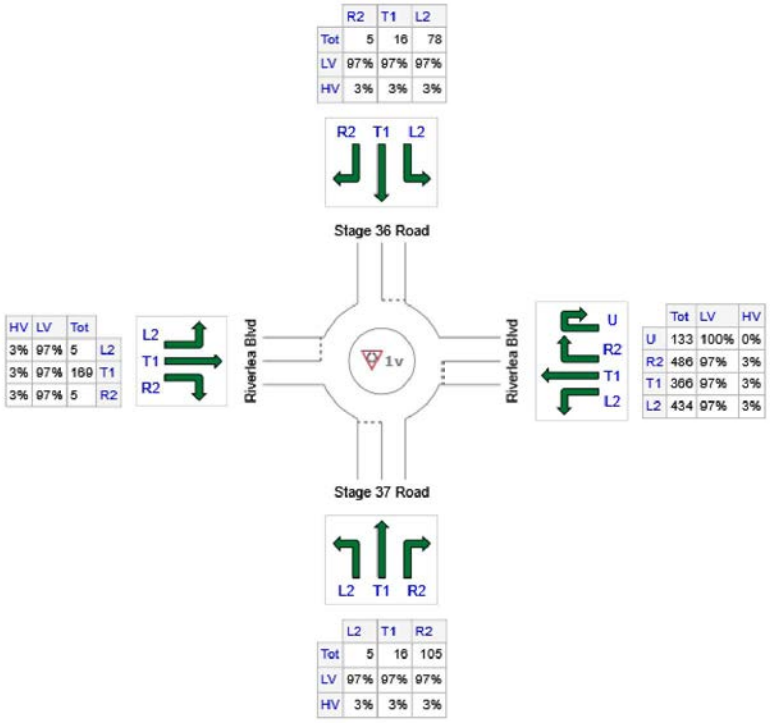
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 1v [Prec2_Int_6-Pre3a-Ultimate-PM (Site Folder: Precinct 3a)]

Intersection 6
Ultimate volumes
PM Peak
Site Category: (None)
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: Stage 37 Road	126	122	4
E: Riverlea Blvd	1419	1380	39
N: Stage 36 Road	99	96	3
W: Riverlea Blvd	179	174	5
Total	1823	1772	51

MOVEMENT SUMMARY

Site: 1v [Prec2_Int_6-Pre3a-Ultimate-PM (Site Folder: Precinct 3a)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 6
Ultimate volumes
PM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stage 37 Road															
1	L2	All MCs	5	3.0	5	3.0	0.237	9.2	LOS A	1.1	7.8	0.71	0.82	0.71	45.6
2	T1	All MCs	17	3.0	17	3.0	0.237	7.8	LOS A	1.1	7.8	0.71	0.82	0.71	43.0
3	R2	All MCs	111	3.0	111	3.0	0.237	13.3	LOS A	1.1	7.8	0.71	0.82	0.71	45.1
Approach			133	3.0	133	3.0	0.237	12.4	LOS A	1.1	7.8	0.71	0.82	0.71	44.9
East: Riverlea Blvd															
4	L2	All MCs	457	3.0	457	3.0	0.460	3.7	LOS A	4.5	32.0	0.20	0.38	0.20	50.7
5	T1	All MCs	385	3.0	385	3.0	0.460	3.6	LOS A	4.5	32.0	0.20	0.39	0.20	54.8
6	R2	All MCs	512	3.0	512	3.0	0.460	9.4	LOS A	4.4	31.6	0.22	0.57	0.22	47.1
6u	U	All MCs	140	0.0	140	0.0	0.460	11.7	LOS A	4.4	31.6	0.22	0.57	0.22	50.3
Approach			1494	2.7	1494	2.7	0.460	6.4	LOS A	4.5	32.0	0.21	0.47	0.21	50.2
North: Stage 36 Road															
7	L2	All MCs	82	3.0	82	3.0	0.084	4.2	LOS A	0.4	2.8	0.50	0.52	0.50	49.9
8	T1	All MCs	17	3.0	17	3.0	0.038	5.4	LOS A	0.2	1.2	0.54	0.58	0.54	46.4
9	R2	All MCs	5	3.0	5	3.0	0.038	12.6	LOS A	0.2	1.2	0.54	0.58	0.54	48.9
Approach			104	3.0	104	3.0	0.084	4.8	LOS A	0.4	2.8	0.51	0.53	0.51	49.2
West: Riverlea Blvd															
10	L2	All MCs	5	3.0	5	3.0	0.116	8.0	LOS A	0.8	5.8	0.76	0.64	0.76	51.8
11	T1	All MCs	178	3.0	178	3.0	0.116	8.5	LOS A	0.8	5.8	0.76	0.66	0.76	51.9
12	R2	All MCs	5	3.0	5	3.0	0.116	15.0	LOS B	0.7	5.3	0.76	0.68	0.76	50.5
Approach			188	3.0	188	3.0	0.116	8.7	LOS A	0.8	5.8	0.76	0.66	0.76	51.9
All Vehicles			1919	2.8	1919	2.8	0.460	6.9	LOS A	4.5	32.0	0.31	0.51	0.31	49.9

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.
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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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Riverlea - Precinct 2

Island Precinct - Supplement

Transport Impact Assessment

#eta1000045

DATE

02 October 2025

Document Information

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Quality Record

Issue	Date	Description	Author	Checked	Approved	Signed
1	02 October 2025	Parking Plan Additions	TJ	PSM	PSM	

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Tables

1 INTRODUCTION

1.1 Background

Riverlea is a major development which will form a new township in the northern area of greater Adelaide. The township will provide approximately 12,000 dwellings, a district centre, neighbourhood centres, educational facilities, mixed use precincts and recreation precincts to cater for 33,000 residents. The development will be undertaken over 20 years.

Key to the development is the street and road network which will provide access for the daily services and needs of the community. A master plan has been prepared for the whole township, however revisions are proposed to Precincts 1 and 2 to commence creation of the township.

Precinct 2 was included in the masterplan, however it is proposed to revise the layout to integrate better with Precinct 1, which has provided the initial neighbourhood centre, key road network to Port Wakefield Highway and associated residential development.

The Precinct 2 Transport Impact Assessment was prepared by ETA dated 30 September 2024.

1.2 Purpose of this Report

This report is a supplement to the Precinct 2 Transport Impact Assessment was prepared by ETA dated 30 September 2024 and sets out an assessment of the anticipated traffic and transport implications of the proposed “Island” precinct, including consideration of the:

- existing and estimated traffic conditions surrounding the site;
- traffic generation characteristics of the proposed development;
- proposed access arrangements for the site;
- overview of the layout based on the master plan for Precinct 2;
- transport impact of the development proposal on the surrounding township road network.

1.3 References

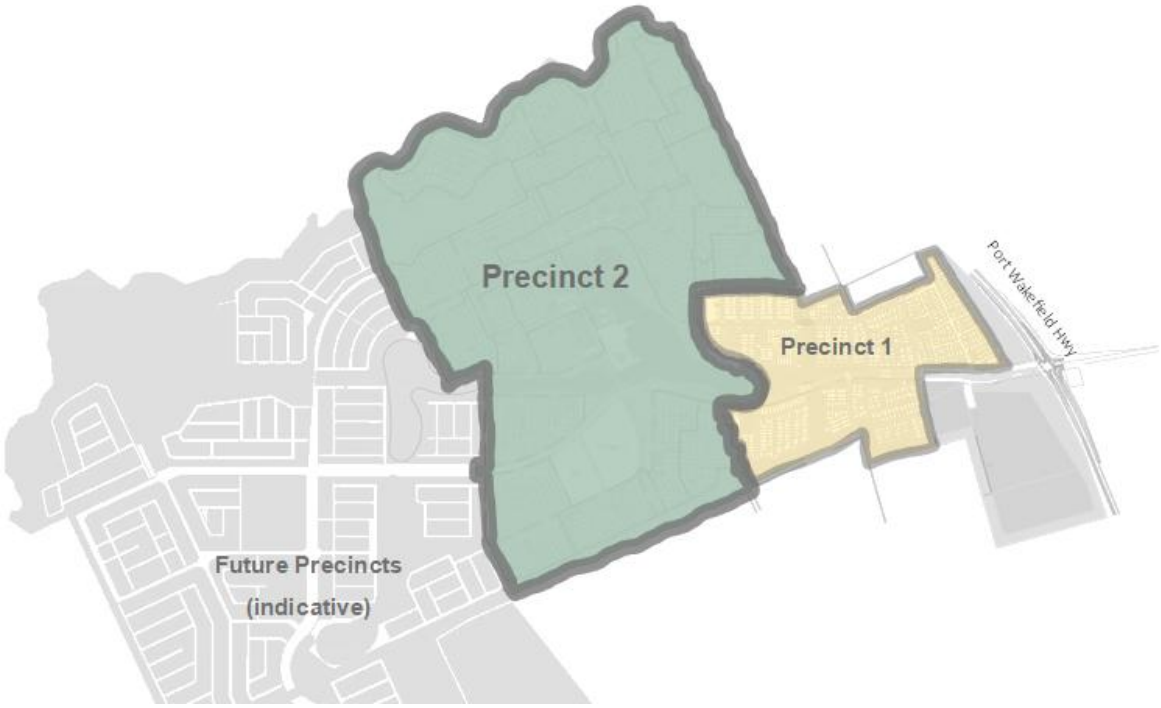
In preparing this report, reference has been made to a number of background documents, including:

- Riverlea - Precinct 2 Masterplan, Transport Impact Assessment, ETA 30 September 2024
- Masterplan for the proposed development provided by Walker Corp (dated 4th June 2013)
- Precinct 2 masterplan provided by Walker Corp (August 2022)
- ‘*Buckland Park Traffic Impact Assessment’* Parsons Brinckerhoff Australia Pty Ltd, 1 April 2009
- Riverlea Precinct 2 Traffic Assessment, GTA Consultants, 2015
- various technical data as referenced in this report
- other documents as nominated.

2 EXISTING CONDITIONS

The subject site is located within the Riverlea development, which is located adjacent Port Wakefield Highway opposite Angle Vale Road. The location of the site can be seen in Figure 2.1.

Figure 2.1: Site and Surrounding Environs



(Basemap courtesy of Walker Corp)

3 DEVELOPMENT PROPOSAL

The revised area within Precinct 2, labelled the “Island”, is proposed to comprise of approximately 1,530 dwellings, incorporating 1,048 apartments and 482 low and medium density dwellings. This results in a decrease of 48 dwelling and an increase of 908 apartments when compared to the previous assessment. A neighbourhood centre, tavern and community facility will be included within the island area. The remaining areas of Precinct 2 are proposed to remain as per the current approvals (as per the Precinct 2 TIA dated 30 September 2024).

Vehicle access to the Island will be from Riverlea Boulevard as per the previous approvals, with a new signalised intersection provided internally to the island, providing vehicle access and also pedestrian connections to/from the neighbourhood centre site.

The revised precinct road network will comprise distributor, collector and local access roads, and some laneways.

The proposed site layout can be seen in Figure 3.1

Figure 3.1: Precinct 2 Island Layout

A comparison of previous Precinct 2 assessment and the proposed changes to the Island are summarised in Table 3.1.

Table 3.1: Dwelling Comparison Between Previous and Current Proposed Precinct 2

Dwelling Type	Previous Precinct 2 Assessment	Proposed Precinct 2 Changes	Proposed Difference
Detached Dwelling	2726	2678	-48
Apartments	350	1258	+908
TOTAL	**3076**	**3936**	**+860**

4 TRAFFIC ASSESSMENT

4.1 Previous Precinct 2 Assessment

The traffic assessment for the previously approved Riverlea township was undertaken by Parsons Brinkerhoff (2013). The assessment was undertaken on the site master plan and did not consider individual precincts. However, the traffic assessment did include traffic generation of the master plan at 5-year intervals based on the anticipated dwelling occupancy.

ETA has also undertaken previous assessment of the overall Precinct 2 proposal, which considered the previous arrangements of the island area. The previous assessment has been updated to consider the as bult infrastructure, as well as the impacts associated with the proposed changes to the island.

ETA undertook an assessment of Precinct 2 for the latest masterplan in 2024 with a report compiling the traffic impacts (refer report dated 30 September 2024 v1). This report provides a supplement to that report for the Island precinct.

4.2 Traffic Generation

4.2.1 Design Rates

Based on experience with other land divisions in greater Adelaide, a traffic generation rate of 8 trips per dwelling per day, and 0.85 trips per dwelling per hour (peak hour) as an average across all dwellings provides a robust method of traffic demand estimation. It is noted that in the City of Playford, 76.4% of people travelled to work in a private car, 3.3% took public transport and 1.2% rode a bike or walked. 5.4% worked at home (extract from census 2021 data). Hence car use in the City of Playford is higher than the greater Adelaide average.

Key to Precinct 2 is the “Island” precinct which will include apartment buildings, and provides better definition of the mix of high and medium density uses, as well as commercial/retail uses. The apartment traffic generation rate from the Transport for New South Wales (TfNSW) Guide to Traffic Impact Assessments (2024) of 2.72 trips per apartment per day and 0.39 trips per apartment per hour it is considered applicable to the apartments.

As such, these rates are been applied for this assessment which is based on traffic generation of each stage in the precinct and distribution across the road network in Precinct 2 and connecting to Precinct 1.

The revised calculations of traffic generation for Precinct 2 are based on the inclusion of the “Island” precinct which includes revisions to the road network.

The proposed Island in Precinct 2 will provide 482 dwellings (low and medium density) which will result in approximately 3,856 trips per day and approximately 410 trips per hour during the peak hours, and the 1,048 apartments which will result in approximately 2,850 trips per day and approximately 409 trips per hour during the peak hours.

Rates provided within the RTA Guide suggest the neighbourhood centre and tavern facility of approximately 5,500 sq.m total floor area will typically attract 6,750 vehicle trips per day (weekday).

As previously mentioned, the traffic associated with the proposed school and neighbourhood centre are anticipated to be associated with Precinct 2 and not “passing trade” from along Port Wakefield Highway. Hence it can be assumed that approximately 30% of all traffic generated by Precinct 2 will be internal to the Precinct 2 site.

4.2.2 Distribution and Assignment

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

- configuration of the distributor road network in the immediate vicinity of the site;
- existing operation of intersections providing access between the local, collector and distributor road network;
- surrounding employment centres, retail centres and schools in relation to the site;
- configuration of access points to the site.

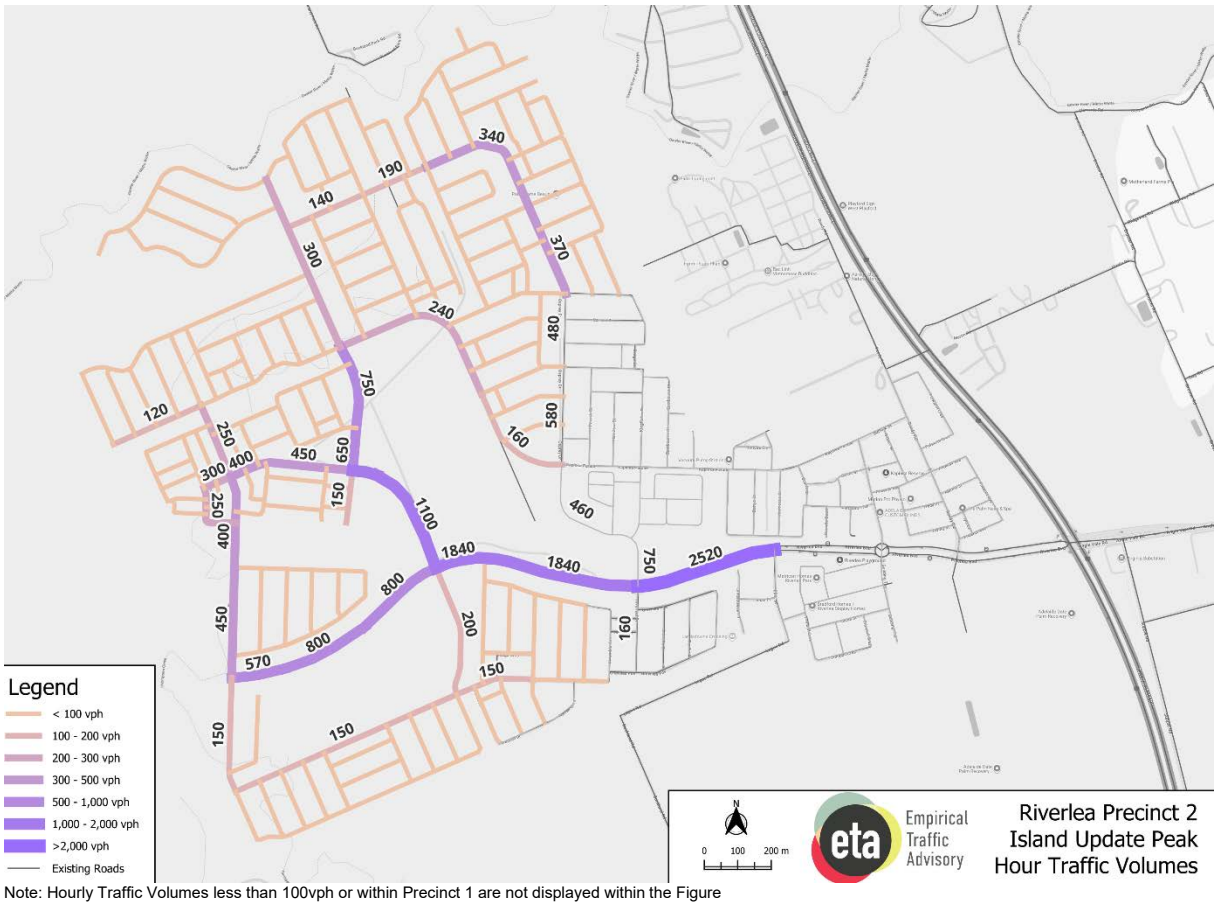
Having consideration to the above, it has assumed that 30% of all trips generated will be internal and the remaining 70% will be external to the Riverlea site (that is to and from Port Wakefield Highway and Angle Vale Road.

Based on the above, Figure 4.1 and Figure 4.2 indicate the predicted traffic volumes for daily and peak hour periods expected on the road network around Riverlea Boulevard. These volumes have been developed to assist in assessing the proposed intersections for appropriate layouts.

Figure 4.1: Predicted Daily Traffic Volumes

Note: Hourly Traffic Volumes less than 1000vpd or within Precinct 1 are not displayed within the Figure

Figure 4.2: Predicted Peak Hour Traffic Volumes



Note: Hourly Traffic Volumes less than 100vph or within Precinct 1 are not displayed within the Figure

In addition, the directional splits of traffic (i.e. the ratio between the inbound and outbound traffic movements) in the AM and PM peak periods are 90:10 (90% outbound 10% inbound) and 10:90 (10% outbound and 90% inbound) respectively for the external trips.

These AM directional splits have been assumed based on the majority of residential traffic likely to be leaving while the PM directional splits have been assumed based on some residents leaving for other activities external to the development site while the inbound traffic is generally residents returning from work.

The internal trip directional splits are assumed to be 50:50 during both peak periods. This internal traffic is likely to be more even with AM directional splits likely to be associated with student drop off and PM directional split likely to be a result of customers at the neighbourhood centre.

4.2.3 Future Traffic Demands – Ultimate Scenario

As the Riverlea development progresses to the west, there will be additional traffic demands on Riverlea Boulevard. The anticipated traffic volumes will be dependant on the future land uses to the west including additional neighbourhood centres, schools, and employment areas that define an areas level of self-sufficiency (that is ability to remain within that area for daily needs) and reduce external trips. As Riverlea develops further west, the level of self-sufficiency is expected to increase and reduce rate of growth of traffic on Riverlea Boulevard.

As part of this assessment, as the proposal increases the number of dwellings/apartments compared to the previous Precinct 2 assessment, the traffic volumes for the ultimate Riverlea site as determined by '*Buckland Park Traffic Impact Assessment*' (Parsons Brinckerhoff Australia Pty Ltd, 1 April 2009) have been reviewed. The review has considered the reduction in the future Precinct 3 and beyond yields as part of the increase in residential dwellings in the island.

The additional traffic generation for the analysis from additional development to the west is expressed as additional trips per hour on Riverlea Boulevard for eastbound and westbound flows. These will be added to the Precinct 2 generated Riverlea Boulevard traffic volumes to identify future traffic volumes. These are shown below in Table 4.1.

Table 4.1: Ultimate Riverlea Development Additional Traffic

Riverlea Boulevard Direction Flow	Peak - Trips per hour	
	AM	**PM**
Eastbound	+669	+286
Westbound	+185	+620
Total	+854	+906

*Note: Additional traffic volumes based on percentage reduction of '*Buckland Park Traffic Impact Assessment*' (Parsons Brinckerhoff Australia Pty Ltd, 1 April 2009) as used in the previous Precinct 2 assessment, where intersections reached capacity.

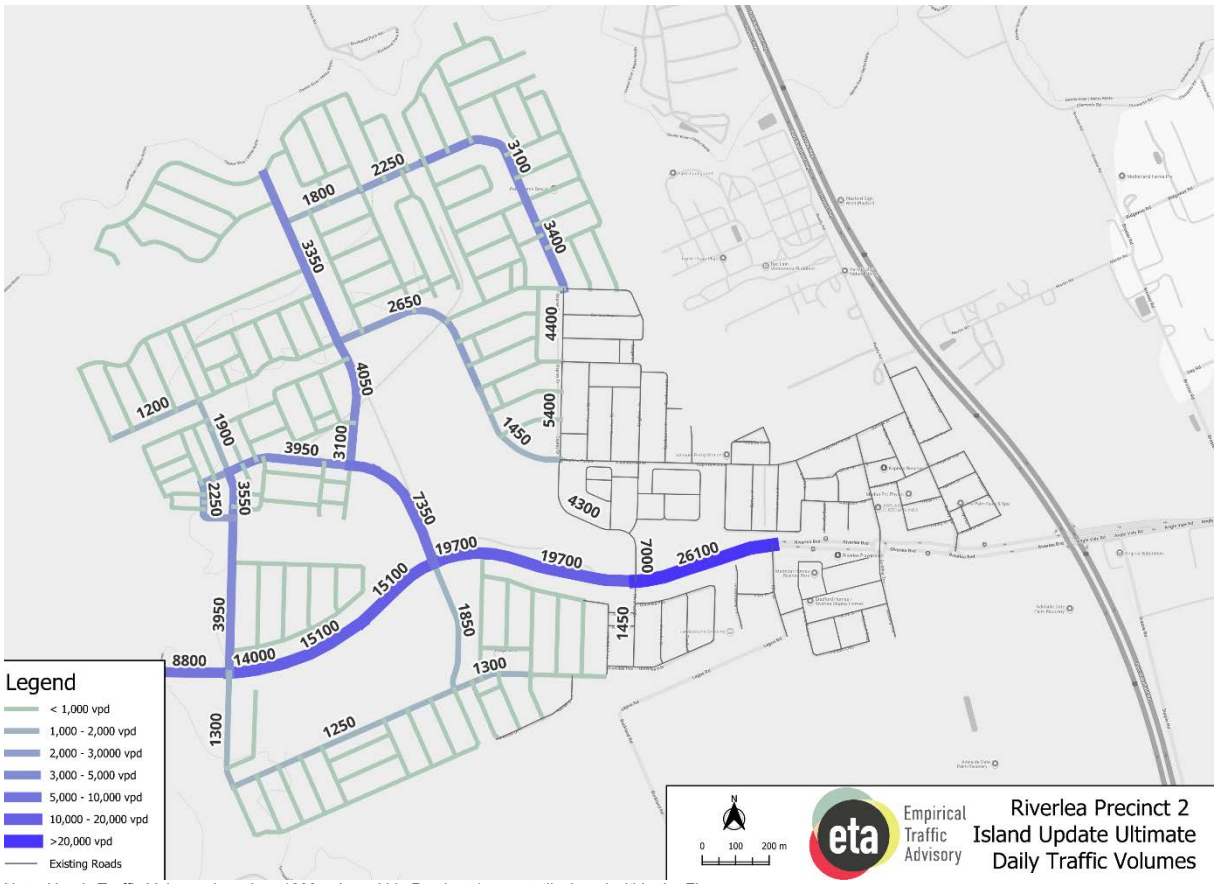
The peak hour volumes would translate to approximately 1,100 additional dwellings from future precincts of the development to the west. Based on current forecast yields of Precinct 3, these additional volumes would account for approximately 36% of future Precinct 3 dwellings.

Utilising the above number of future dwellings, Figure 4.3 and Figure 4.4 indicate the predicted traffic volumes for daily and peak hour periods expected on the road network around Riverlea Boulevard incorporating approximately 36% of Precinct 3.

It should be noted that the modelling assumes all traffic from Precinct 3 will use Riverlea Boulevard as a worst-case scenario of the intersection modelling. This assumption is also premised on the modelling which indicates that downstream intersections will begin to reach capacity with the ultimate traffic volumes. Hence, it would be more efficient for drivers to enter at the western end of Riverlea Boulevard (in Precinct 3) compared to other parts of the road network in order to minimise delays compared to attempting to join Riverlea Boulevard at other intersections in Precinct 2 to the east.

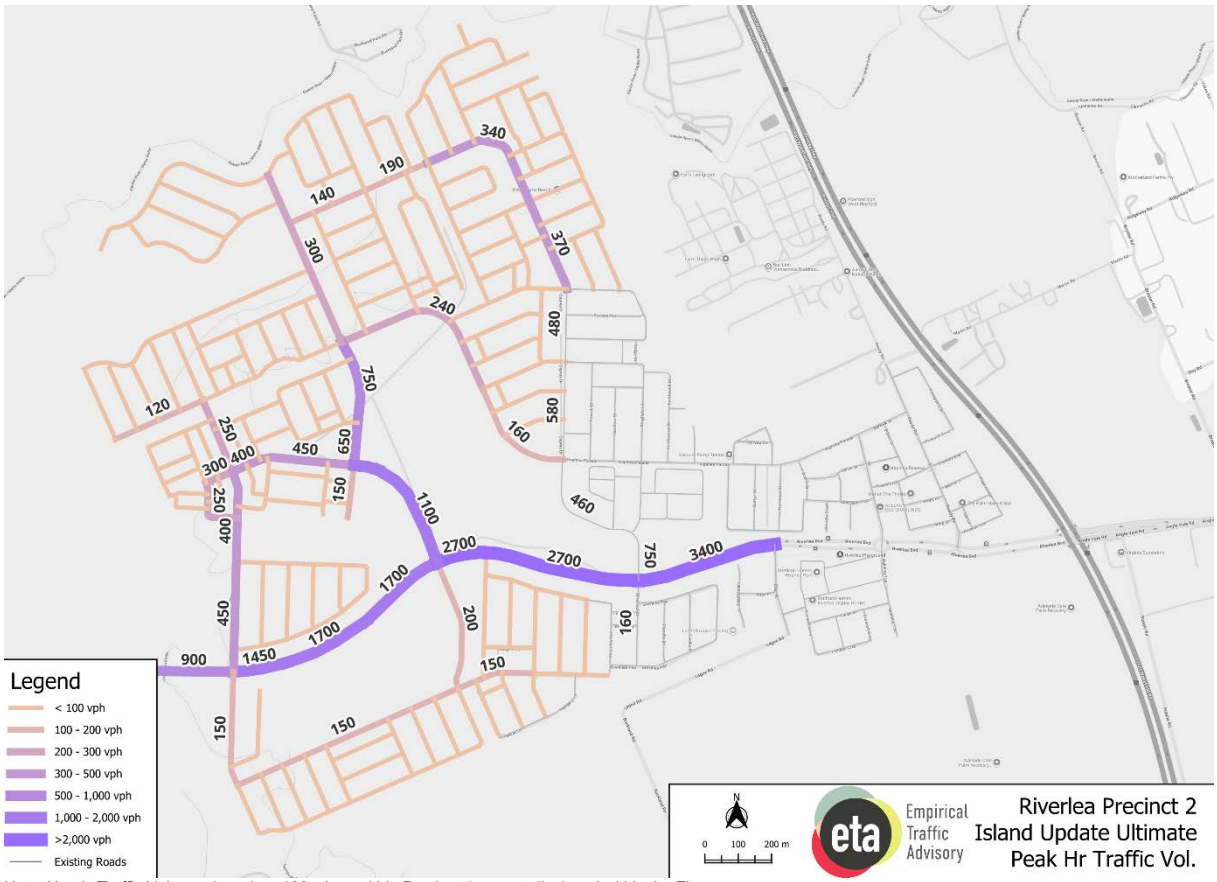
Whilst some traffic could be expected to use the collector road network in the northern part of Precinct 2, it is expected that these volumes would remain low and within collector road volumes (i.e. less than 3,000 vehicles per day).

Figure 4.3: Predicted Daily Traffic Volumes With Future Volumes



Note: Hourly Traffic Volumes less than 1000vpd or within Precinct 1 are not displayed within the Figure

Figure 4.4: Predicted Peak Hour Traffic Volumes With Future Volumes



Note: Hourly Traffic Volumes less than 100vph or within Precinct 1 are not displayed within the Figure

As development occurs to the west, it would be expected that traffic assessments will be revised for each intersection on Riverlea Boulevard, as well as monitoring of traffic volumes to ascertain operating conditions actually occurring.

4.3 Traffic Impact

The impact of Precinct 2 traffic on the road network intersections is considered in this section with up to three intersection layouts considered as follows:

Initial The initial intersection layout proposed for the precinct.

Ultimate The ultimate layout when considering ultimate traffic volumes on Riverlea Boulevard

The impact of the development traffic has been assessed using SIDRA Intersection at key intersections throughout Precinct 2, based on the changes to the island. The key intersection locations are shown in Figure 4.5.

Figure 4.5: Location of Key Intersections

A summary of the intersections from previous assessments and new intersections are shown in Table 4.2.

Table 4.2: Summary of intersections on Riverlea Boulevard

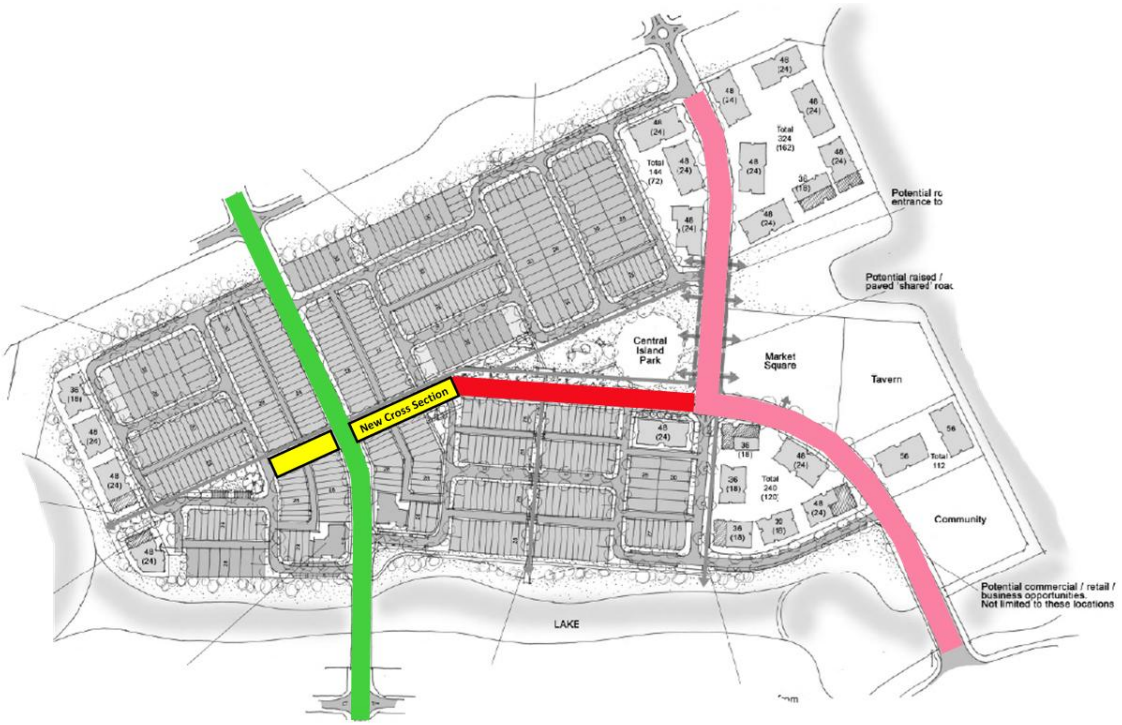
Intersection		Description
Precinct 2	3	Proposed 4-way intersection with 2-lane roundabout.
	5	Proposed 4-way intersection in Precinct 2 – Provides access to Neighbourhood Centre and School/Sports Grounds.
	6	Proposed roundabout for residential access. End of Precinct 2.
	Int	Internal signalised intersection adjacent Neighbourhood Centre

The impacts to the Riverlea Boulevard intersections further to the east of Intersection 3 are considered to have been assessed as part of the Ultimate traffic volumes of the previous assessments of Precinct 1 and the overall masterplan assessment. The volumes associated with Precinct 3a would have been factored into the Ultimate traffic volumes as through movements on Riverlea Boulevard. Therefore, it is considered that further analysis at this stage is not required for the intersections to the east.

5 ACCESS

The layout of the street network for the proposed development is based on a modified grid layout, with local streets connecting to a number of key collector streets and then to the distributor road. A modified grid can provide advantages to a residential area in managing traffic to low volumes on each street, limiting the ability for rat-running through the area, managing the speed environment and providing convenient access for walking, cycling and public transport through the area. The proposed road configuration is shown in Figure 5.1 which indicates the road hierarchy and traffic management.

Figure 5.1: Key Road Hierarchy



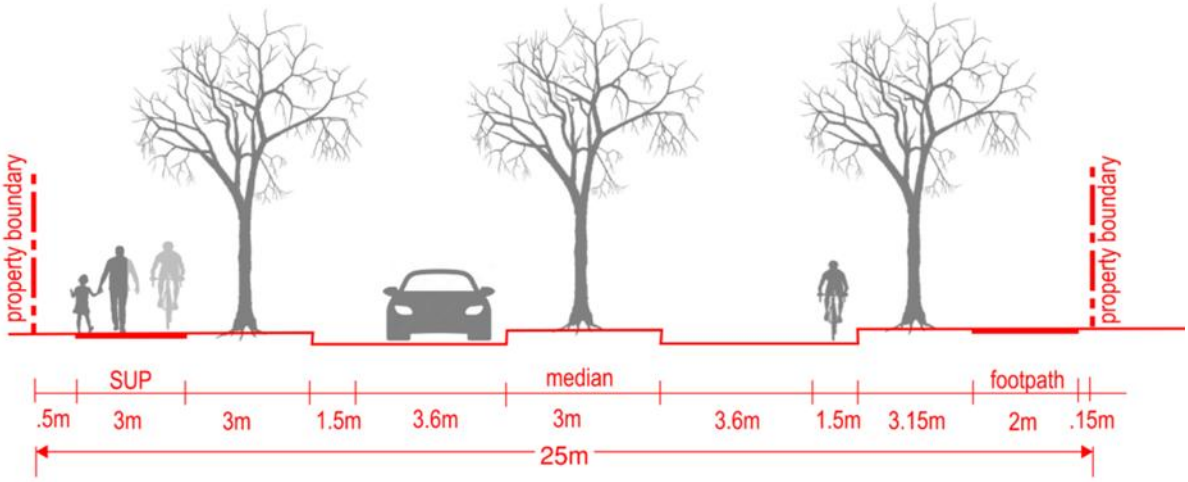
Type	Reserve width	Carriageway	Travel lanes	Bicycle lanes	Median	Indented Parking	Footpath	Bus route
Width (m)	metres		3.6	1.5		2.5	2	
Distributor (Riverlea Blvd.)	36.6	Dual	4	✓ (1.8m)	6m (min)	no	✓	✓
Neighbourhood Centre	28.5	Single (split)	2	✓	3.5m	both sides	×	✓
Collector A	25	Single	2	✓	×	both sides	✓	✓
Collector B	22	Single	2	×	×	both sides	×	×
Collector C	20	Single	2	✓	×	reserve side only	✓	×
Collector D	19	Single	2	×	×	both sides	×	×
Local Esplanade Roads	16	Single	2	×	×	reserve side only	✓	×
Local Street	16	Single	2	×	×	on street	×	×
Local Esplanade Streets	14	Single	2	×	×	on street	✓	×
Laneway	9	Single	2 x 3.5m	×	×	×	×	×

5.1 Road Cross Sections

The proposed development will comprise roads of varying widths suited to the function of streets within the network and were included in the Precinct 2 Transport Impact Assessment dated 30 September 2025. The Island precinct will utilise these cross sections generally with some modifications as required for provision of on-street parking and bicycle lanes.

A new road cross section is provided within the precinct, with the proposed road cross section shown in Figure 5.2. The new road cross section provides a shared use path on the northern side of the road, a raised median, bicycle lanes and associated single lane carriageways.

Figure 5.2: New Road Cross Section



5.2 T-junctions

The majority of the local street intersections within the proposed development will be controlled by T-Junctions. Realigned T-junctions may be used at number of locations throughout the development. A realigned T-junction is designed to effect a change in the vehicle travel path thereby slowing traffic via deflection of traffic movements and/or reassignment of priority. These are effective in limiting street lengths and managing speeds on a local road network whilst maintaining a modified grid network. As a result, the safety within the local road network can be improved.

Traffic management measures are required at T-junctions to ensure drivers understand the give-way priority assigned. Generally, the right angle bend in conjunction with appropriate kerb alignments will be sufficient however a review in detailed design should consider the following methods to clarify give way priority:

- Give way signs on the minor road approach.
- Pavement marking on the bend for the centreline and parking control.
- Distinctive pavement on the minor road approach.
- Consideration of the radius of bends to ensure suitable turn paths are achieved for the anticipated traffic volumes and vehicle types.

5.3 Roundabouts

A roundabout controlled intersection is proposed in the Island precinct. The roundabout will be designed to allow full turning movements for larger vehicles, and in order to cater for semi-trailers a mountable island should be provided. The roundabouts will be required to conform to the relevant standards and guidelines, and the Code, which would be confirmed in detailed design.

5.4 Laneways

Laneways are proposed in a number of locations to provide rear-loaded access to higher density dwellings, for instance row dwellings. The laneways will be wide enough to enable access to garages, provide for rear waste collection.

5.5 Vehicle Speed Management

Austroads Guide to Road Design Part 3: Geometric Design states a typical acceleration of 1km/h for every 5 metres is possible for private vehicles from a stationary position. Therefore, a vehicle can be expected to reach 50km/h (the expected posted speed limit) from a stopped position after 250 metres.

Figure 3.4 Acceleration on straights (in the Guide) indicates that based on an entry speed of 20km/h (typical for most right angle bends) straights up to 300 metres in length will maintain a maximum speed of 40km/h. This would to most local streets in a semi-grid layout as proposed in Precinct 2.

Streets with higher entry speeds would be collector roads where roundabouts are typically used to manage speeds along these roads. With an entry speed of 30km/h, straights of up to 300 metres will maintain speeds less than 50km/h which would be suitable for collector roads. Generally, most streets in the proposed development will be less than 300 metres in length. These streets will generally assist in creating a speed environment of less than 50km/h, and closer to 35km/h where streets are less than 200 metres long. Urban design techniques to assist in managing vehicle speeds including tree plantings and house design/driveways, in conjunction with carriageway design techniques will be considered in the context of street design features to manage speeds.

Notwithstanding the above, vehicle speeds within Precinct 2 will be generally managed and can be confirmed in design of the built form for the land division.

5.6 Intersection Sight Distance

In order to provide fundamental safety at intersections, adequate sight distances must be provided at each one. There are three categories of sight distances, these are:

- Approach Sight Distance (ASD)
- Safe Intersection Sight Distance (SISD)
- Minimum Gap Sight Distance (MGSD).

A description and review of each of these sight distances for the proposed development is discussed in the following sections.

Approach Sight Distance (ASD)

ASD is the sight distance required for a driver of a vehicle on a minor road approaching an intersection to observe the holding line for the intersection on the ground. The distance is required such that the driver can observe the holding line, react and stop as required.

Based upon the table provided with the Austroads '*Guide to Road Design Part 4a: Signalised and Signalised Intersections*' (2009, henceforth referred to as Austroads Guide) a design speed of 50km/h has an ASD of 55 metres.

Safe Intersection Sight Distance (SISD)

SISD is the sight distance required for a driver of a vehicle on a major road approaching an intersection to observe a vehicle within the intersection. The SISD is required such that if a vehicle has stopped (i.e. stalled) within an intersection the driver of the approach vehicle on the major road will observe the vehicle and be able to react and stop if required.

Based upon the table provided with the Austroads Guide a design speed of 50km/h has an SISD of 97 metres.

Minimum Gap Sight Distance (MGSD)

MGSD is the sight distance required for a driver of a vehicle on a minor road at the intersection to observe vehicles in the conflicting streams. The distance is required such that the vehicle can view approaching vehicles in order to safely commence the desired manoeuvre.

The MGSD is based upon the number of lanes the vehicle is required to cross, the type of manoeuvre that is required.

Austroads Guide requires a road with a design speed of 50km/h has an MGSD of 69 metres for the critical right turn movement on a two lane/two way road.

Sight Distance Summary

An assessment of the above horizontal sight distances indicates the intersections within the proposed development can provide the minimum requirements. A further sight distance assessment is recommended during detailed design to ensure the horizontal and vertical sight distances are met.

5.7 Street Gradients for Vehicles

It is noted that the current site is very flat and roads will generally be designed with appropriate grades for stormwater management, as opposed to achieving compatibility with existing terrain in undulating environments. Hence, grades of streets are not considered to be an issue within the precinct.

5.8 Public Transport

Bus routes are proposed to provide public transport access to the Riverlea township. The bus routes were indicated in the Precinct 2 Masterplan Transport Impact Assessment report. The actual services will be confirmed on conjunction with agreement from the Department for Infrastructure and Transport.

5.9 Heavy Vehicles

Heavy vehicles will use the proposed road network on an occasional service for waste collection within the proposed residential area and commercial uses. The proposed road network will be capable of providing appropriate access subject to detailed design of intersections and junction to ensure safe and appropriate turning movements are available.

The higher density sites will be designed to accommodate heavy vehicle access for deliveries and waste collection with the use of on-street and off-street areas. These will be subject to detailed design of each of the high density dwelling locations and commercial sites.

5.10 Parking

The proposed road network will provide a high level of on-street parking which will cater for a minimum of 1 on-street space per 3 dwellings/allotments or more based on the proposed road cross sections, which will assist in catering for visitors to row dwellings. Based on approximately 500 dwellings/allotments, this would require a total of 167 on-street parking spaces. The street cross sections include a variety on-street parking on the carriageway or indented parking bays. A preliminary parking

plan has been prepared for the Island precinct, shown in Appendix A, which indicates that up to 728 on-street parking spaces could be provided. This on-street parking plan considers where there is on-street parking on both sides of the carriageway, passing opportunities are available approximately every 30m.

Development on the sites within the Island precinct will need to consider off-street parking provision in accordance with the SA Planning & Design Code as applies at the time of development applications for these sites, including residential and commercial. The parking rates that currently apply for the types of residential and commercial uses likely in the Island precinct are shown in Table 5.1.

Table 5.1: SA Planning & Design Code Parking Requirements (off-street)

Residential Flat Building	Dwelling with 1 or 2 bedrooms (including rooms capable of being used as a bedroom) - 1 space per dwelling. Dwelling with 3 or more bedrooms (including rooms capable of being used as a bedroom) - 2 spaces per dwelling, 1 of which is to be covered. 0.33 spaces per dwelling for visitor parking where development involves 3 or more dwellings.
Row Dwelling where vehicle access is from the primary street	Dwelling with 1 bedroom (including rooms capable of being used as a bedroom) - 1 space per dwelling. Dwelling with 2 or more bedrooms (including rooms capable of being used as a bedroom) - 2 spaces per dwelling, 1 of which is to be covered.
Row Dwelling where vehicle access is not from the primary street (i.e. rear-loaded)	Dwelling with 1 or 2 bedrooms (including rooms capable of being used as a bedroom) - 1 space per dwelling. Dwelling with 3 or more bedrooms (including rooms capable of being used as a bedroom) - 2 spaces per dwelling, 1 of which is to be covered.
Shop (no commercial kitchen)	5.5 spaces per 100m2 of gross leasable floor area where not located in an integrated complex containing two or more tenancies (and which may comprise more than one building) where facilities for off-street vehicle parking, vehicle loading and unloading, and the storage and collection of refuse are shared. 5 spaces per 100m2 of gross leasable floor area where located in an integrated complex containing two or more tenancies (and which may comprise more than one building) where facilities for off-street vehicle parking, vehicle loading and unloading, and the storage and collection of refuse are shared.
Shop (in the form of a bulky goods outlet)	2.5 spaces per 100m2 of gross leasable floor area.
Shop (in the form of a restaurant or involving a commercial kitchen)	Premises with a dine-in service only (which may include a take-away component with no drive-through) - 0.4 spaces per seat. Premises with take-away service but with no seats - 12 spaces per 100m2 of total floor area plus a drive-through queue capacity of ten vehicles measured from the pick-up point. Premises with a dine-in and drive-through take-away service - 0.3 spaces per seat plus a drive through queue capacity of 10 vehicles measured from the pick-up point.
Hotel	1 space for every 2m2 of total floor area in a public bar plus 1 space for every 6m2 of total floor area available to the public in a lounge, beer garden plus 1 space per 2 gaming machines, plus 1 space per 3 seats in a restaurant.

5.11 Bicycle Access

Bicycle access will be maintained through the Island as indicated for Precinct 2 with bicycle routes on key collector roads. The low speed design and low volumes on most of the local street network will also facilitate safe bicycle access. The proposed network will provide a high level of accessibility to the neighbourhood centre and school precincts within the site.

Bicycle parking will be considered as part of off-street parking for development of the various uses within the Island precinct, using the requirements of the SA Planning & Design Code.

6 INTERSECTIONS

Each intersection has been assessed individually for performance based on anticipated traffic demands. Intersection layouts have been based on the as built/construction plans where available or schematic layouts for each intersection to indicate required lane arrangements. Other features such as pedestrian crossings, suitable turn paths for design vehicles and location of traffic signal posts are assumed to be included and to be confirmed in detailed design.

6.1 Intersection 3 Assessment

A roundabout is proposed at this intersection as part of Precinct 1 development (Silverleaf Drive in Stage 4), with 2 lanes for eastbound and westbound traffic on Riverlea Boulevard. A single lane approach for the north and south legs.

The anticipated AM and PM peak hour traffic volumes for Precinct 2 volumes at intersection 3 are shown in Figure 6.1. The Ultimate through volumes on Riverlea Drive are also shown.

Figure 6.1: Intersection 3 – Precinct 2 AM & PM Peak Hour Turning Volumes

Intersection 3 N Road

		PM	51	5	85			
Riverlea Blvd		AM	51	5	561		*Riverlea Blvd*	
PM	AM		R←	T↓	L→		AM	PM
51	51	L↑				↑R	85	561
348 (634)	1384 (2053)	T→				←T	348 (533)	1384 (2004)
5	5	R↓				↓L	22	120
			L←	T↑	R→			
		AM	5	5	120			
		PM	5	5	22			

Intersection 3 S Road

Through values on Riverlea Boulevard within Brackets indicate the future traffic for the Ultimate intersection analysis.

6.1.1 Intersection 3 Analysis Summary

A summary of the Intersection 3 analysis is summarised in Table 6.1. SIDRA intersection outputs are provided in Appendix B.

Table 6.1: Intersection 3 – SIDRA Summary

Intersection Type	Peak Period	Degree of Saturation	Level of Service	Maximum Vehicle Queue (m)
Roundabout Initial Layout	AM Peak	0.575	A	32.1
	PM Peak	0.696	A	62.1
Roundabout Initial Layout - Upgrade Trigger	AM Peak	0.828	A	66.4
	PM Peak	0.847	A	131.6
Signals Ultimate Volumes	AM Peak	0.851	A	193.3
	PM Peak	0.765	A	89.3

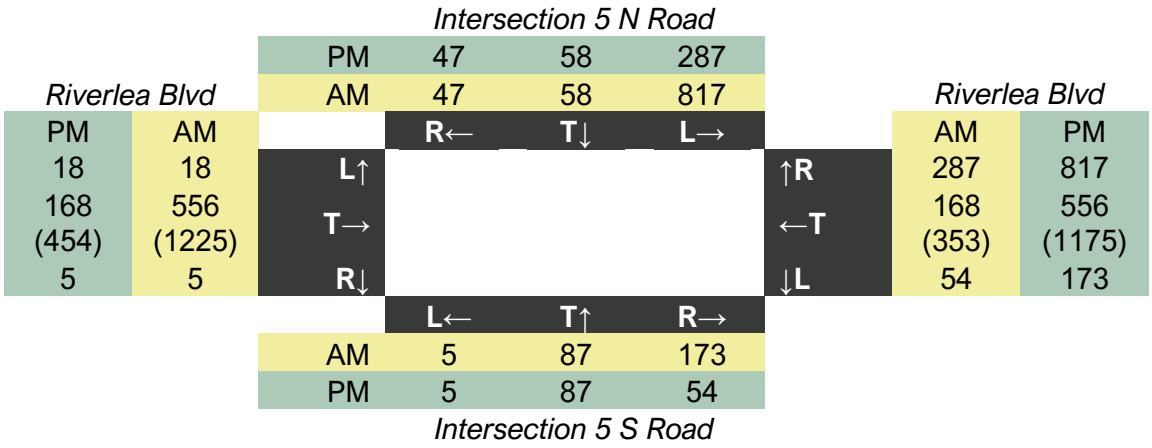
The SIDRA Intersection analysis indicates that the as built roundabout at Intersection 3 will operate satisfactorily and within capacity for the predicted Precinct 2 traffic volumes, and up to 800 dwellings of Precinct 3.

Traffic signals will be required in the ultimate layout when Riverlea is developed to the west. In particular, a free flowing left turn will be required from Osprey Drive (north leg) to Riverlea Boulevard (east leg) due to the high eastbound flows on Riverlea Boulevard in the AM peak period and filtered right turn movements to accommodate the high right turn flows northbound in the PM peak period.

6.2 Intersection 5 Assessment

Intersection 5 is proposed to be a four-way intersection linking between the Neighbourhood Centre to the north and school/sports precinct to the south of Riverlea Boulevard. This intersection is a key location for access in this precinct, in particular for pedestrian and cyclist movements to and from retail/commercial, school and sporting uses. The anticipated AM and PM peak hour traffic volumes for Precinct 2 volumes at intersection 5 are shown in Figure 6.1. There will be high traffic volume of vehicle turning left from NCe Road to travel east on Riverlea Boulevard in the AM Peak, and return to turn right into NCe Road in the PM peak.

Figure 6.2: Intersection 5 – Precinct 2 AM & PM Peak Hour Turning Volumes



6.2.1 Intersection 5 Analysis Summary

A summary of the Intersection 5 analysis is summarised in Table 6.2. SIDRA intersection outputs are provided in Appendix C.

Table 6.2: Intersection 5 – SIDRA Summary

Intersection Type	Peak Period	Degree of Saturation	Level of Service	Maximum Vehicle Queue (m)
Signalised Precinct 2 Volumes	AM Peak	0.826	D	148.0
	PM Peak	0.818	C	269.4
Signalised Ultimate Volumes	AM Peak	0.892	E	341.3
	PM Peak	0.887	D	303.7

Intersection 5 will provide access to the proposed Neighbourhood Centre (to the north) and Sports Fields/School to the south. It will have a mix of traffic movements in conjunction with high flows on Riverlea Boulevard. Pedestrian access should be considered at this intersection with crossings on each side of the intersection.

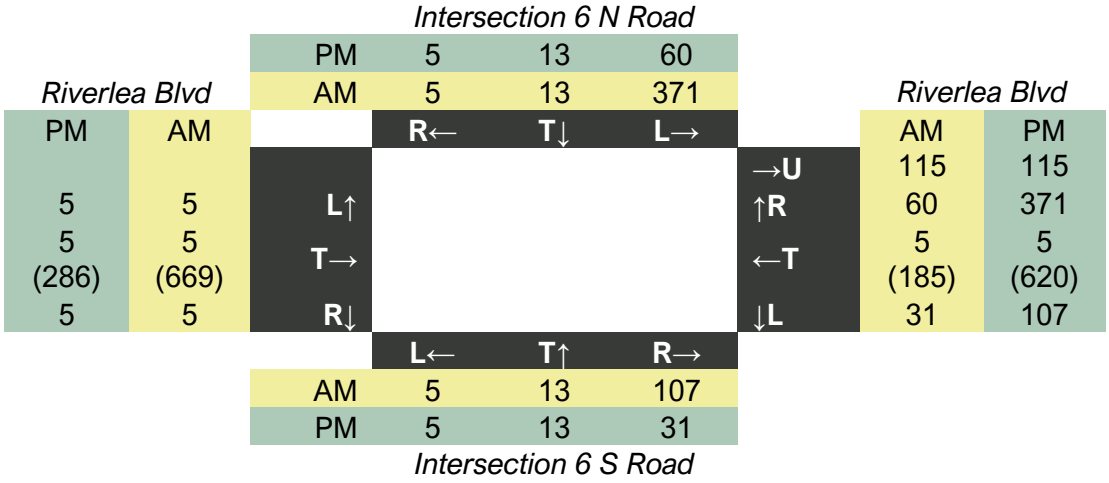
The Ultimate PM peak period indicates that the right turn movements to the NCe Road will over spill the capacity of the turning lane. While the lane is overspilling, the volume of westbound vehicles is able to traverse the intersection with minimal impacts.

6.3 Intersection 6 Assessment

Intersection 6 will initially be at the end of the Riverlea Precicnt 2 development, with a roundabout proposed to connect to residential stages to the north and south with provision to continue Riverlea Boulevard to the west.

The anticipated AM and PM peak hour traffic volumes for Precinct 2 volumes at intersection 5 are shown in Table 6.3.

Figure 6.3: Intersection 6 – AM & PM Peak Hour Turning Volumes



6.3.1 Intersection 6 Summary

A summary of the Intersection 6 analysis is summarised in Table 6.3. SIDRA intersection outputs are provided in Appendix D.

Table 6.3: Intersection 6 – SIDRA Summary

Intersection Type	Peak Period	Degree of Saturation	Level of Service	Maximum Vehicle Queue (m)
Roundabout Precinct 2 Volumes	AM Peak	0.333	A	14.3
	PM Peak	0.291	A	15.4
Roundabout Ultimate Volumes	AM Peak	0.518	A	24.8
	PM Peak	0.392	A	24.9

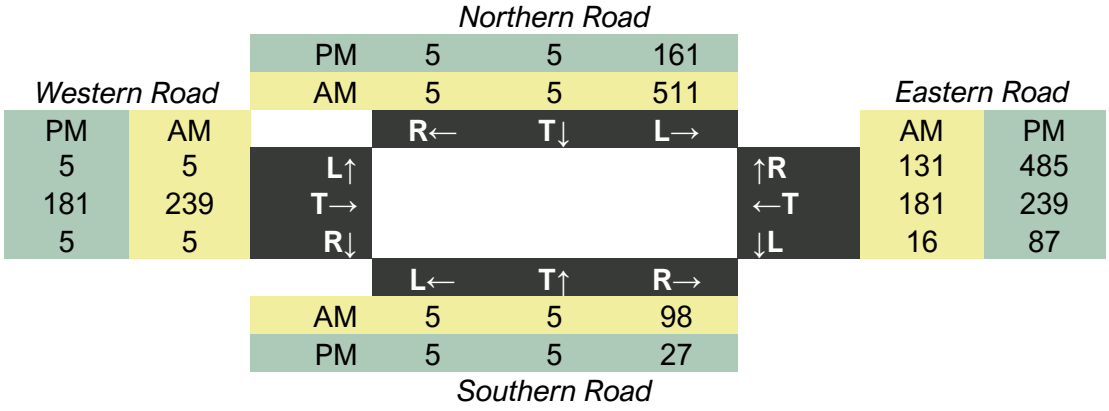
The modelling indicates that the ultimate layout for the intersection will be able to adequately cater for the ultimate volumes with the extension of Riverlea Boulevard to the west.

6.4 Internal Intersection Assessment

The internal intersection within the island is proposed to be a signalised intersection. This intersection is a key location for access in this precinct, in particular for pedestrian and cyclist movements to and from the retail/commercial precinct.

The anticipated AM and PM peak hour traffic volumes for Precinct 2 volumes at intersection 5 are shown in Figure 6.4.

Figure 6.4: Internal Intersection – AM & PM Peak Hour Turning Volumes



6.4.1 Internal Intersection Summary

A summary of the Internal Intersection analysis is summarised in Table 6.4. SIDRA intersection outputs are provided in Appendix E.

Table 6.4: Internal Intersection – SIDRA Summary

Intersection Type	Peak Period	Degree of Saturation	Level of Service	Maximum Vehicle Queue (m)
Signals Precinct 2 Volumes	AM Peak	0.648	C	67.6
	PM Peak	0.691	C	54.0

The modelling indicates that the traffic signals will be able to accommodate the traffic volumes within the island. In particular, a high angle left turn is indicated on the northern intersection leg to accommodate the high traffic volumes travelling between the northern leg and the eastern leg to access Riverlea Boulevard.

6.5 Intersection Summary

The analysis of the intersections in Precinct 2 indicates that in general, the as built/construction plans of the intersections can accommodate the Initial and Ultimate traffic volumes. only intersection within Precicnt 2 that requires upgrading to accommodate the traffic volumes is Intersection 3.

A comparison of the intersection spacing (excluding unsignalised intersections) and the 95th percentile queues of the ultimate volumes are outlined in Table 6.5. The modelling indicates that the maximum vehicle queues in the AM and PM peaks are not to extend into the intersections.

Table 6.5: Intersection Distance and 95th%ile Queue Comparison

Intersection	Distance to Next Intersection - West (m)	Max 95th%ile Queue to West (m)	Distance to Next Intersection - East (m)	Max 95th%ile Queue to East (m)
3	580	193.3	730	89.3
5	440	303.7	580	110.8
6	-	14.9	200	24.9

6.6 Intersection Upgrade Timing

The likely need to upgrade the intersections from interim to ultimate based on future development to the west for Precinct 3 and 4 has been reviewed as part of the intersection analysis. For this assessment, it should be noted that the additional traffic volumes assumed to be from the west (from the whole development) has been developed from the original PB modelling which considered a secondary access and high level of self-sufficiency in each precinct with schools, employment and activity centres. In simple terms this equates to about 3,000 dwellings if no secondary connection is provided.

Hence it is likely overall that the intersections would need to be upgraded prior to full occupation of Precinct 3 assuming it will be similar size to Precinct 2. This assumption is made on the basis that a secondary access would not be available until Precinct 4 for which planning would occur during the development of Precinct 3. It would be assumed that a secondary connection would be provided prior to full occupation of Precinct 3. The analysis generally indicates intersections will need upgrading by 36% of the occupation of Precinct 3 (or about 1100 dwellings in addition to Precinct 2 dwellings). The above assumes Precinct 2 is complete and occupied.

Given the above, the timing of intersection upgrades is shown in Table 6.6.

Table 6.6: Intersection Upgrade Timing

Intsn.	Initial	Ultimate
3	Precinct 2 and up to 800 additional dwellings	From 800 dwellings provided within of Precinct 3 complete and occupied
5	Initial and Ultimate will be the same signalised intersection	
6	Initial and Ultimate will be the same unsignalised intersection	

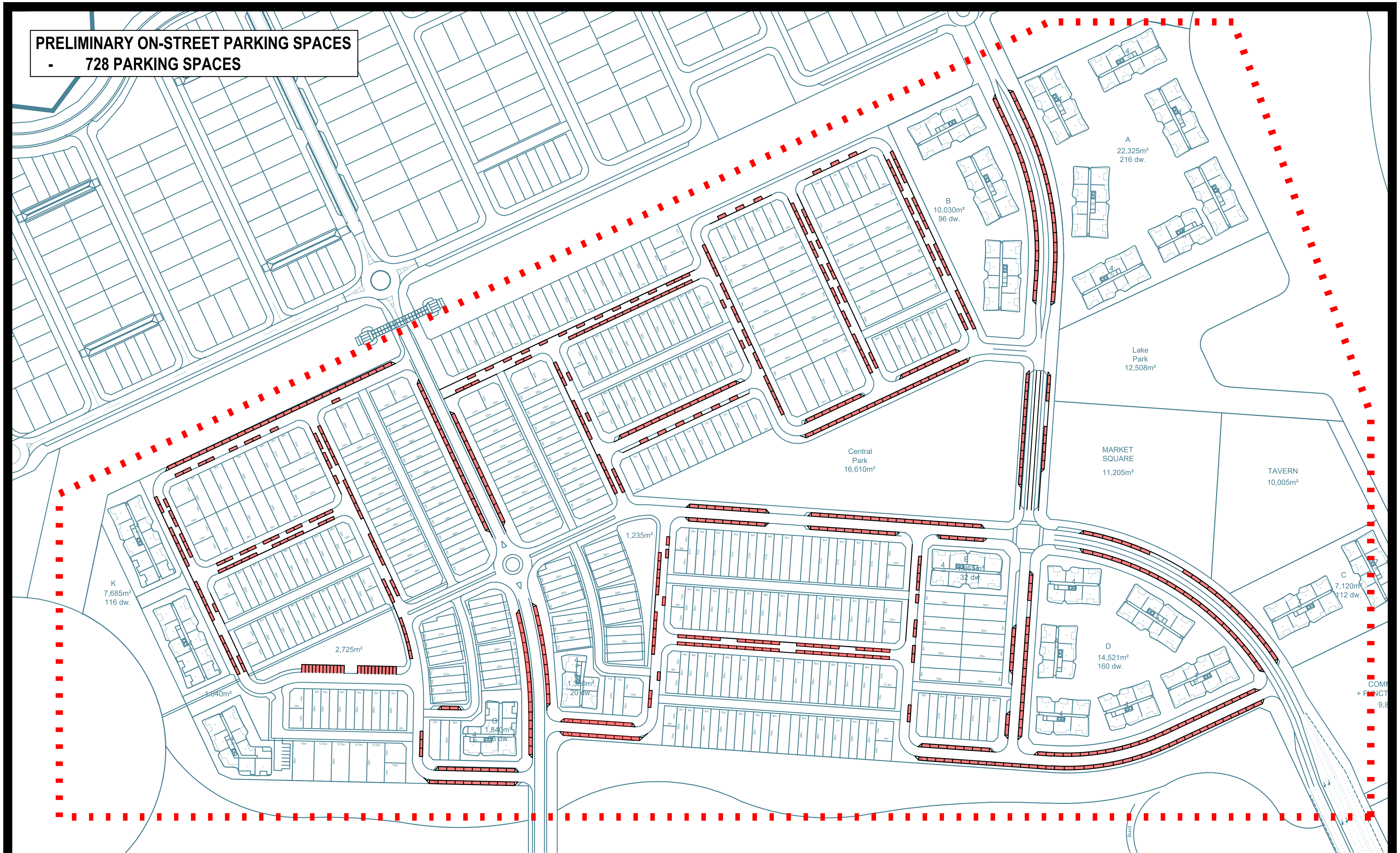
7 CONCLUSIONS

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

1. The proposed Island precinct within Precinct 2 development will include high and medium density residential dwellings (apartments and townhouses) with associated neighbourhood centre and recreational facilities within a modified grid network and key access routes to Riverlea Boulevard.
2. The proposed Island in Precinct 2 will provide 482 dwellings (low and medium density) which will result in approximately 3,856 trips per day and approximately 410 trips per hour during the peak hours, and the 1,048 apartments which will result in approximately 2,850 trips per day and approximately 409 trips per hour during the peak hours.
3. The increase in traffic generated by the Island precinct will reduce the amount of traffic that can be accommodated on Riverlea Boulevard intersections based on appropriate capacity for traffic signal and roundabout controls. The peak hour volumes would translate to approximately 1,100 additional dwellings from future precincts of the development to the west. Based on current forecast yields of Precinct 3, these additional volumes would account for approximately 36% of future Precinct 3 dwellings.
4. A review of the proposed intersections on Riverlea Boulevard has identified the initial intersection layouts which will cater for the revised Precinct 2 traffic demands, and ultimate intersection layouts which will cater for future traffic demands of Riverlea as it is developed to the west (as discussed above).
5. Previous analysis has found that the Precinct 1 intersections will be able to cater for the traffic demands of Precinct 2, and similarly preliminary analysis of the Port Wakefield Highway / Riverlea Boulevard intersection will be capable of handling the increase demand of Precinct 2 within existing capacity of the intersection. These intersections should be reviewed as part of planning of future precincts to confirm continued suitable operation.
6. The configurations of the street network in the Island precinct will be conducive to a low speed environment of less than 40km/h on the minor streets, and 50km/h on collector streets which will link to Riverlea Boulevard.
7. The street network will be planned to accommodate bus services when required, with road carriageways suitable for bus travel through the precinct. The actual routes are yet to be confirmed.

Appendix A Preliminary On-Street Parking Plan

PRELIMINARY ON-STREET PARKING SPACES
- 728 PARKING SPACES



CONCEPT PLAN ONLY
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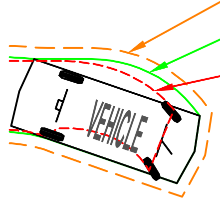
VEHICLE PATH LEGEND

300mm CLEARANCE TO BODY
BODY OUTLINE
WHEEL PATH



TURN PATH DIAGRAMS DEMONSTRATE A METHOD OF VEHICLE MANEOUVERING. OTHER METHODS MAY BE POSSIBLE DEPENDING ON DRIVER AND VEHICLE.

N

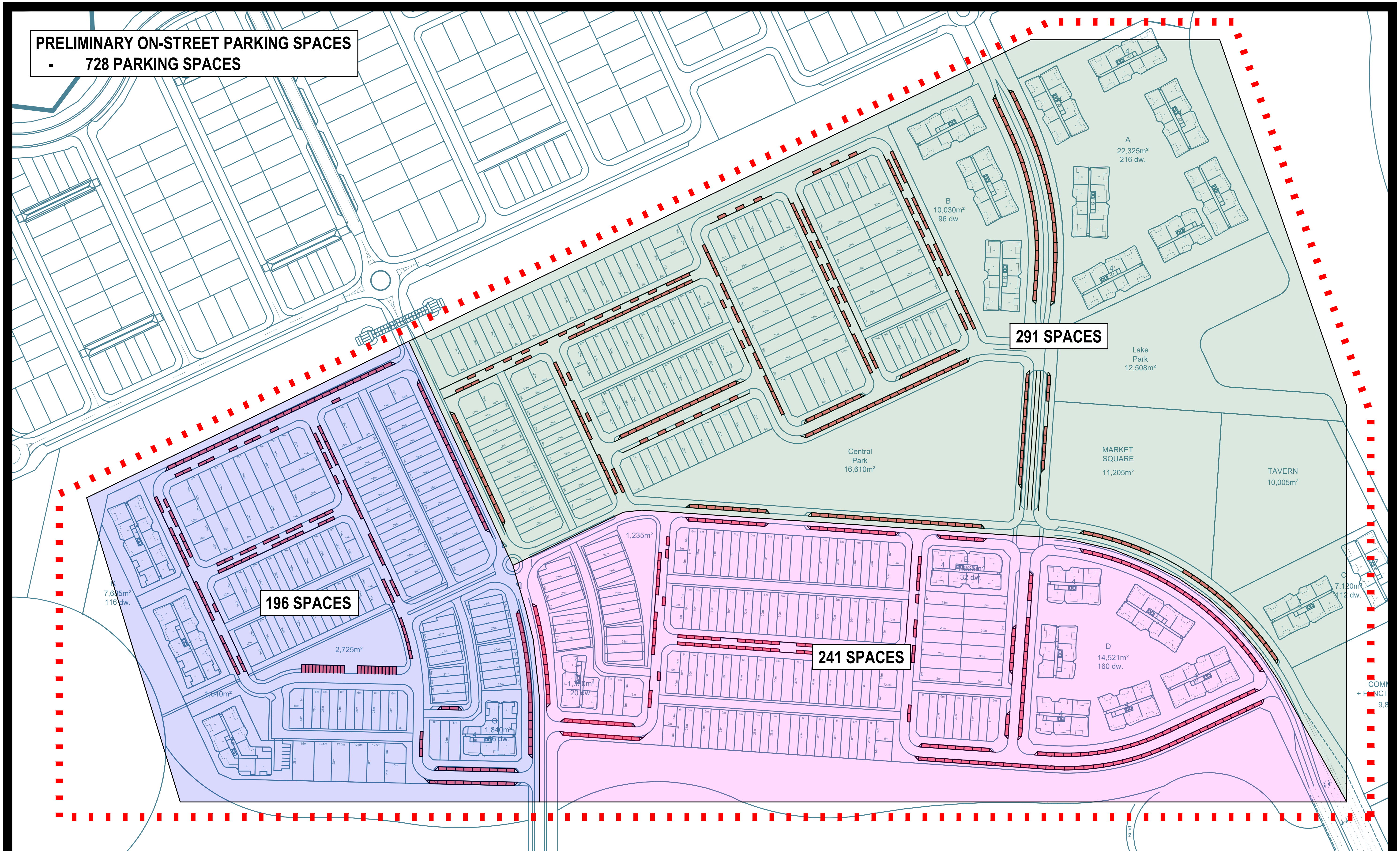
eta Empirical Traffic Advisory

SCALE 1:2500
0 25.0 50.0
metres

APPROVED: PSM
DATE: 2 October 2025
FILENAME: 251002-1000045-105-A.DWG

RIVERLEA
PRECINCT 2 ISLAND UPDATE
PRELIMINARY ON-STREET PARKING PLAN
CONCEPT PLAN

DRAWING: 251002-1000045-105-A-SK01



CONCEPT PLAN ONLY
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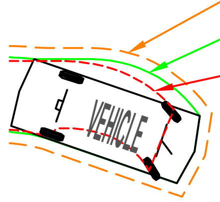
VEHICLE PATH LEGEND



300mm CLEARANCE TO BODY

BODY OUTLINE

WHEEL PATH

TURN PATH DIAGRAMS DEMONSTRATE A METHOD OF VEHICLE MANEOUVERING. OTHER METHODS MAY BE POSSIBLE DEPENDING ON DRIVER AND VEHICLE.

N

eta Empirical Traffic Advisory

SCALE 1:2500

0 25.0 50.0

metres

APPROVED: PSM

DATE: 2 October 2025

FILENAME: 251002-1000045-105-A.DWG

RIVERLEA
PRECINCT 2 ISLAND UPDATE
PRELIMINARY ON-STREET PARKING PLAN
CONCEPT PLAN

DRAWING: 251002-1000045-105-A-SK02

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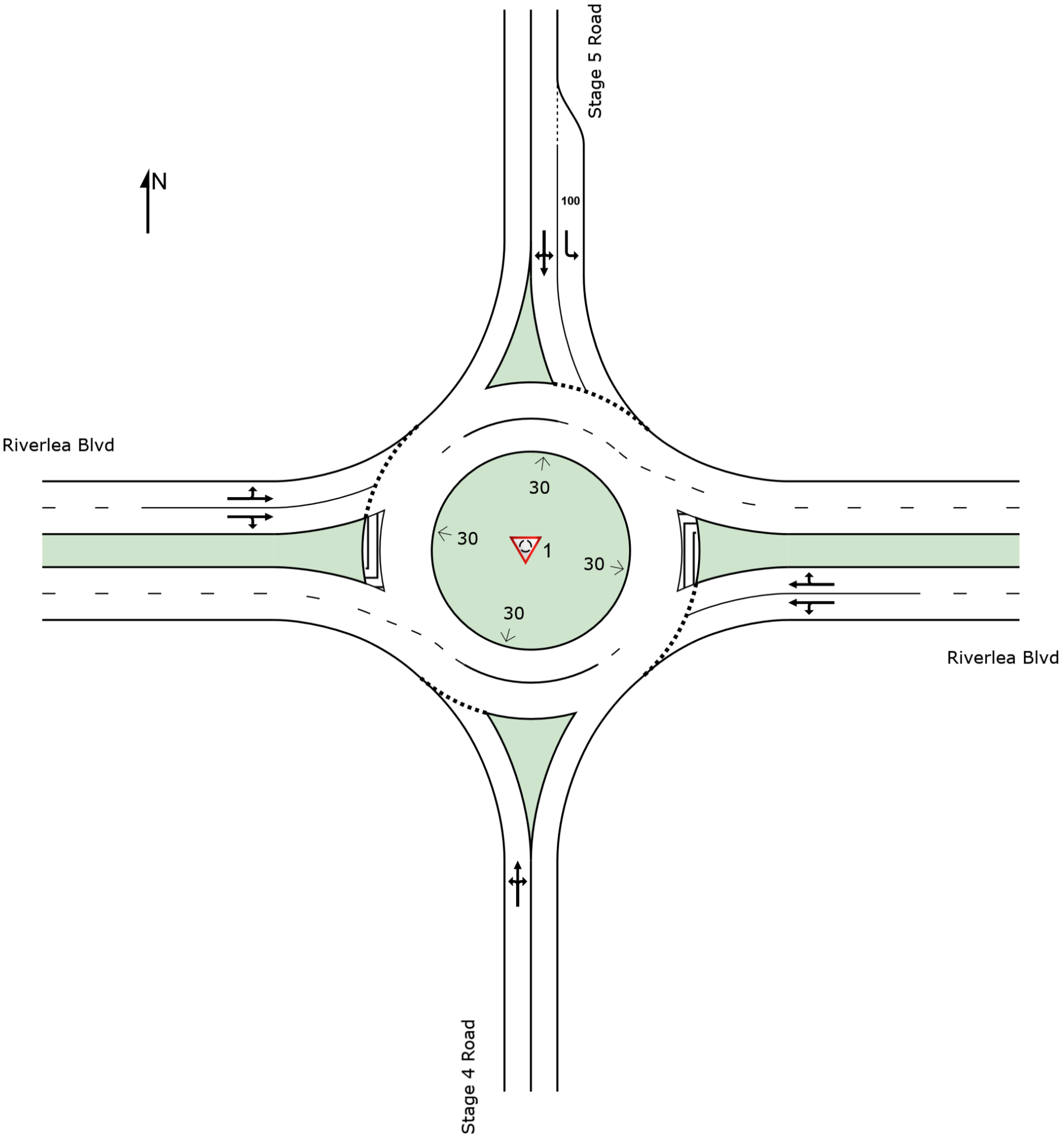
Appendix B Intersection 3 SIDRA Summary

SITE LAYOUT

Site: 1 [Prec2_Int3_Pre2_AM (Site Folder: Precinct 2 Update)]

Intersection 3
Precinct 2 Volumes
AM Peak
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



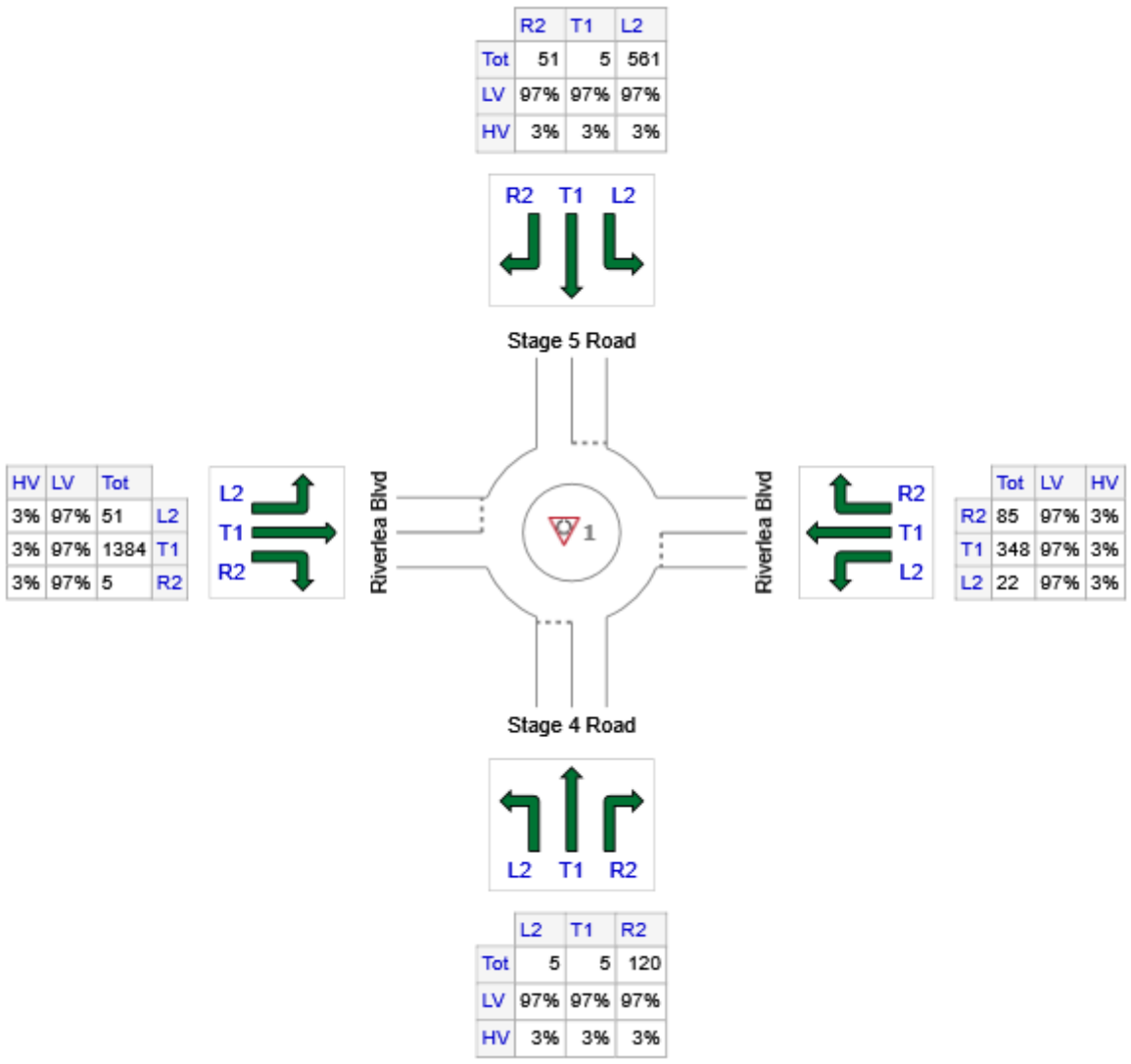
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 1 [Prec2_Int3_Pre2_AM (Site Folder: Precinct 2 Update)]

Intersection 3
Precinct 2 Volumes
AM Peak
Site Category: (None)
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: Stage 4 Road	130	126	4
E: Riverlea Blvd	455	441	14
N: Stage 5 Road	617	598	19
W: Riverlea Blvd	1440	1397	43
Total	2642	2563	79

MOVEMENT SUMMARY

Site: 1 [Prec2_Int3_Pre2_AM (Site Folder: Precinct 2 Update)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 3
Precinct 2 Volumes
AM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stage 4 Road															
1	L2	All MCs	5	3.0	5	3.0	0.170	4.5	LOS A	0.7	4.7	0.49	0.69	0.49	47.1
2	T1	All MCs	5	3.0	5	3.0	0.170	4.2	LOS A	0.7	4.7	0.49	0.69	0.49	44.4
3	R2	All MCs	126	3.0	126	3.0	0.170	9.7	LOS A	0.7	4.7	0.49	0.69	0.49	46.7
Approach			137	3.0	137	3.0	0.170	9.3	LOS A	0.7	4.7	0.49	0.69	0.49	46.6
East: Riverlea Blvd															
4	L2	All MCs	23	3.0	23	3.0	0.159	3.9	LOS A	1.1	7.5	0.23	0.35	0.23	50.5
5	T1	All MCs	366	3.0	366	3.0	0.159	3.7	LOS A	1.1	7.5	0.23	0.39	0.23	54.3
6	R2	All MCs	89	3.0	89	3.0	0.159	9.4	LOS A	1.0	7.3	0.24	0.47	0.24	48.9
Approach			479	3.0	479	3.0	0.159	4.8	LOS A	1.1	7.5	0.24	0.41	0.24	53.0
North: Stage 5 Road															
7	L2	All MCs	591	3.0	591	3.0	0.575	10.9	LOS A	4.0	28.7	0.86	0.98	1.16	43.0
8	T1	All MCs	5	3.0	5	3.0	0.575	11.5	LOS A	3.6	25.9	0.86	1.00	1.16	42.4
9	R2	All MCs	54	3.0	54	3.0	0.575	17.0	LOS B	3.6	25.9	0.86	1.00	1.16	44.5
Approach			649	3.0	649	3.0	0.575	11.4	LOS A	4.0	28.7	0.86	0.98	1.16	43.1
West: Riverlea Blvd															
10	L2	All MCs	54	3.0	54	3.0	0.566	5.0	LOS A	4.5	32.1	0.50	0.48	0.50	53.1
11	T1	All MCs	1457	3.0	1457	3.0	0.566	5.0	LOS A	4.5	32.1	0.51	0.50	0.51	53.5
12	R2	All MCs	5	3.0	5	3.0	0.566	10.9	LOS A	4.3	30.6	0.53	0.52	0.53	48.9
Approach			1516	3.0	1516	3.0	0.566	5.0	LOS A	4.5	32.1	0.51	0.50	0.51	53.4
All Vehicles			2781	3.0	2781	3.0	0.575	6.7	LOS A	4.5	32.1	0.55	0.61	0.61	50.2

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.
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.

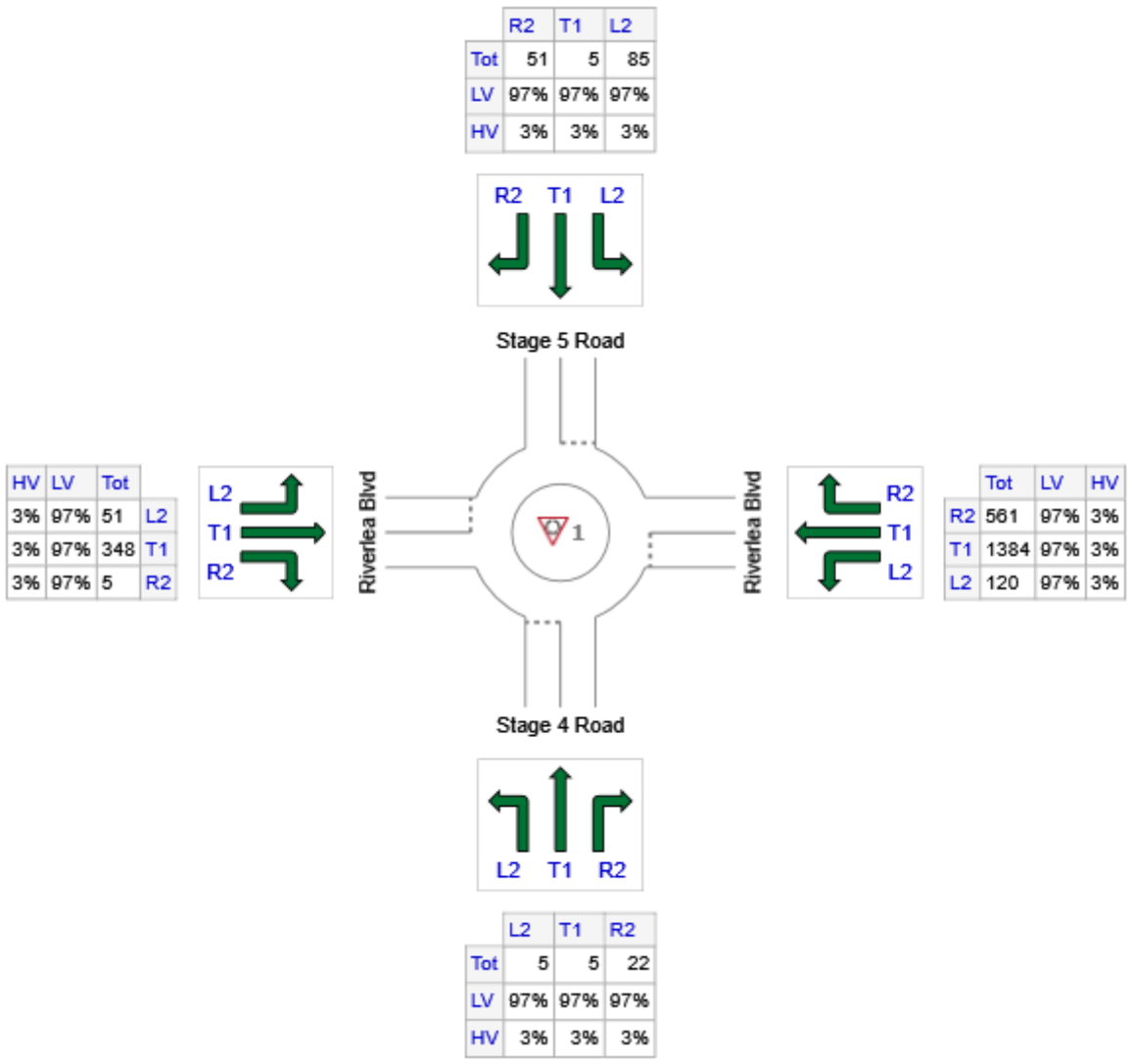
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 1 [Prec2_Int3_Pre2_PM (Site Folder: Precinct 2 Update)]

Intersection 3
Precinct 2 Volumes
PM Peak
Site Category: (None)
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: Stage 4 Road	32	31	1
E: Riverlea Blvd	2065	2003	62
N: Stage 5 Road	141	137	4
W: Riverlea Blvd	404	392	12
Total	2642	2563	79

MOVEMENT SUMMARY

Site: 1 [Prec2_Int3_Pre2_PM (Site Folder: Precinct 2 Update)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 3
Precinct 2 Volumes
PM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stage 4 Road															
1	L2	All MCs	5	3.0	5	3.0	0.097	11.0	LOS A	0.4	2.9	0.80	0.90	0.80	44.3
2	T1	All MCs	5	3.0	5	3.0	0.097	10.7	LOS A	0.4	2.9	0.80	0.90	0.80	41.9
3	R2	All MCs	23	3.0	23	3.0	0.097	16.2	LOS B	0.4	2.9	0.80	0.90	0.80	43.9
Approach			34	3.0	34	3.0	0.097	14.5	LOS A	0.4	2.9	0.80	0.90	0.80	43.6
East: Riverlea Blvd															
4	L2	All MCs	126	3.0	126	3.0	0.696	4.2	LOS A	8.7	62.1	0.40	0.38	0.40	49.8
5	T1	All MCs	1457	3.0	1457	3.0	0.696	4.0	LOS A	8.7	62.1	0.41	0.42	0.41	53.5
6	R2	All MCs	591	3.0	591	3.0	0.696	9.9	LOS A	8.6	61.7	0.45	0.50	0.45	47.7
Approach			2174	3.0	2174	3.0	0.696	5.6	LOS A	8.7	62.1	0.42	0.44	0.42	51.6
North: Stage 5 Road															
7	L2	All MCs	89	3.0	89	3.0	0.073	3.6	LOS A	0.3	2.2	0.43	0.51	0.43	46.4
8	T1	All MCs	5	3.0	5	3.0	0.073	3.2	LOS A	0.3	2.2	0.44	0.61	0.44	45.0
9	R2	All MCs	54	3.0	54	3.0	0.073	8.7	LOS A	0.3	2.2	0.44	0.61	0.44	47.3
Approach			148	3.0	148	3.0	0.073	5.5	LOS A	0.3	2.2	0.43	0.55	0.43	46.7
West: Riverlea Blvd															
10	L2	All MCs	54	3.0	54	3.0	0.225	6.5	LOS A	1.4	10.2	0.63	0.63	0.63	52.5
11	T1	All MCs	366	3.0	366	3.0	0.225	6.7	LOS A	1.4	10.2	0.64	0.65	0.64	52.9
12	R2	All MCs	5	3.0	5	3.0	0.225	12.9	LOS A	1.3	9.3	0.64	0.66	0.64	48.3
Approach			425	3.0	425	3.0	0.225	6.8	LOS A	1.4	10.2	0.64	0.65	0.64	52.8
All Vehicles			2781	3.0	2781	3.0	0.696	5.9	LOS A	8.7	62.1	0.46	0.48	0.46	51.3

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.
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.

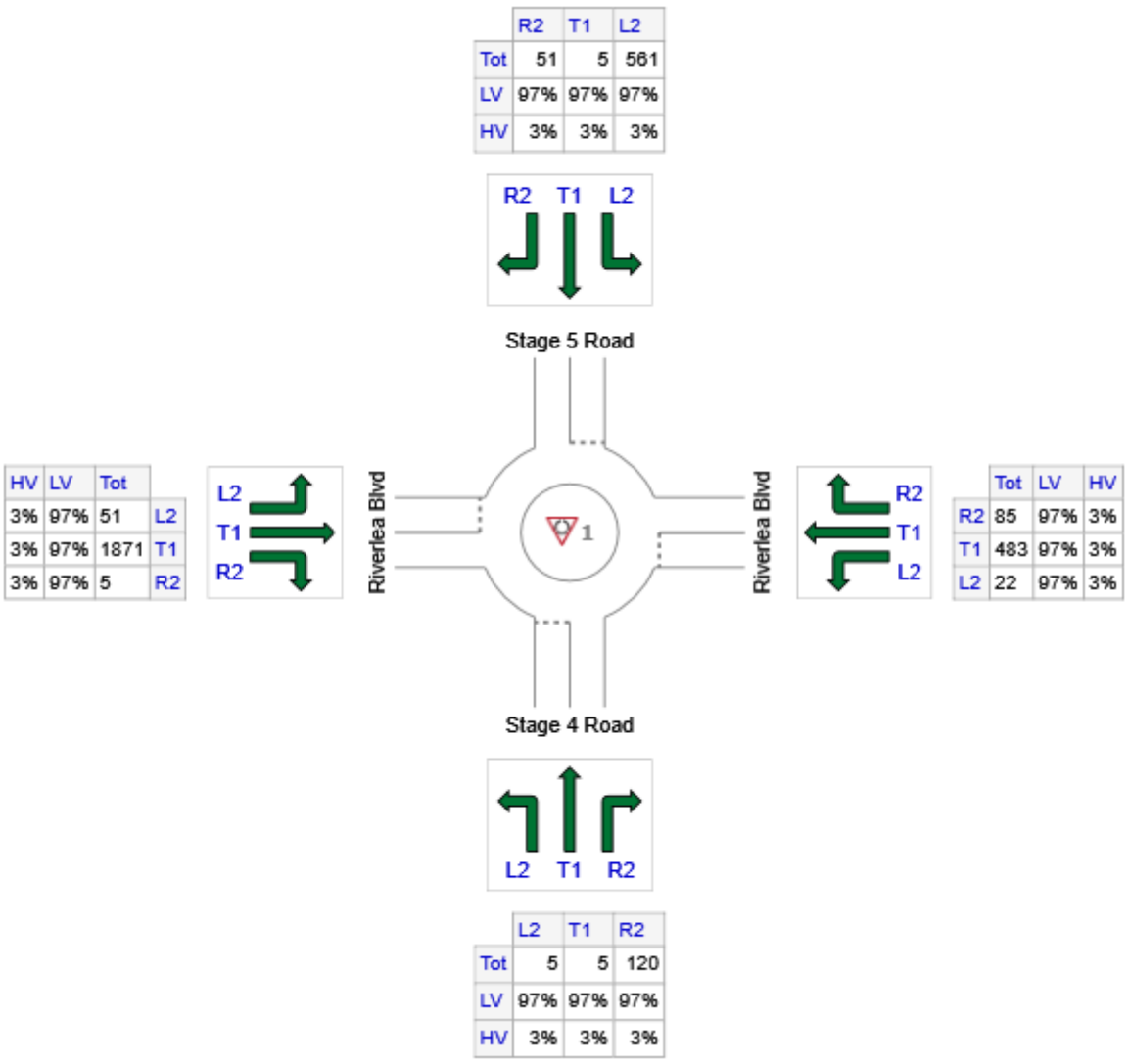
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 1 [Prec2_Int3_Pre2_AM_Trigger (Site Folder: Precinct 2 Update)]

Intersection 3
Trigger Volumes
AM Peak
Site Category: (None)
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: Stage 4 Road	130	126	4
E: Riverlea Blvd	590	572	18
N: Stage 5 Road	617	598	19
W: Riverlea Blvd	1927	1869	58
Total	3264	3166	98

MOVEMENT SUMMARY

Site: 1 [Prec2_Int3_Pre2_AM_Trigger (Site Folder: Precinct 2 Update)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 3
Trigger Volumes
AM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stage 4 Road															
1	L2	All MCs	5	3.0	5	3.0	0.184	5.0	LOS A	0.7	5.1	0.54	0.73	0.54	46.9
2	T1	All MCs	5	3.0	5	3.0	0.184	4.7	LOS A	0.7	5.1	0.54	0.73	0.54	44.2
3	R2	All MCs	126	3.0	126	3.0	0.184	10.2	LOS A	0.7	5.1	0.54	0.73	0.54	46.4
Approach			137	3.0	137	3.0	0.184	9.8	LOS A	0.7	5.1	0.54	0.73	0.54	46.3
East: Riverlea Blvd															
4	L2	All MCs	23	3.0	23	3.0	0.205	3.9	LOS A	1.5	10.5	0.25	0.35	0.25	50.5
5	T1	All MCs	508	3.0	508	3.0	0.205	3.7	LOS A	1.5	10.5	0.25	0.39	0.25	54.4
6	R2	All MCs	89	3.0	89	3.0	0.205	9.5	LOS A	1.4	10.1	0.26	0.45	0.26	49.1
Approach			621	3.0	621	3.0	0.205	4.5	LOS A	1.5	10.5	0.25	0.39	0.25	53.4
North: Stage 5 Road															
7	L2	All MCs	591	3.0	591	3.0	0.828	29.2	LOS C	8.5	61.0	0.98	1.33	1.97	35.4
8	T1	All MCs	5	3.0	5	3.0	0.828	32.0	LOS C	7.0	50.4	0.96	1.32	1.92	34.3
9	R2	All MCs	54	3.0	54	3.0	0.828	37.5	LOS C	7.0	50.4	0.96	1.32	1.92	35.7
Approach			649	3.0	649	3.0	0.828	29.9	LOS C	8.5	61.0	0.98	1.33	1.96	35.4
West: Riverlea Blvd															
10	L2	All MCs	54	3.0	54	3.0	0.756	5.9	LOS A	9.2	66.0	0.64	0.57	0.66	52.4
11	T1	All MCs	1969	3.0	1969	3.0	0.756	6.3	LOS A	9.2	66.4	0.66	0.60	0.71	52.7
12	R2	All MCs	5	3.0	5	3.0	0.756	12.6	LOS A	9.2	66.4	0.69	0.64	0.76	48.2
Approach			2028	3.0	2028	3.0	0.756	6.3	LOS A	9.2	66.4	0.66	0.60	0.71	52.7
All Vehicles			3436	3.0	3436	3.0	0.828	10.6	LOS A	9.2	66.4	0.64	0.71	0.85	48.2

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.
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.

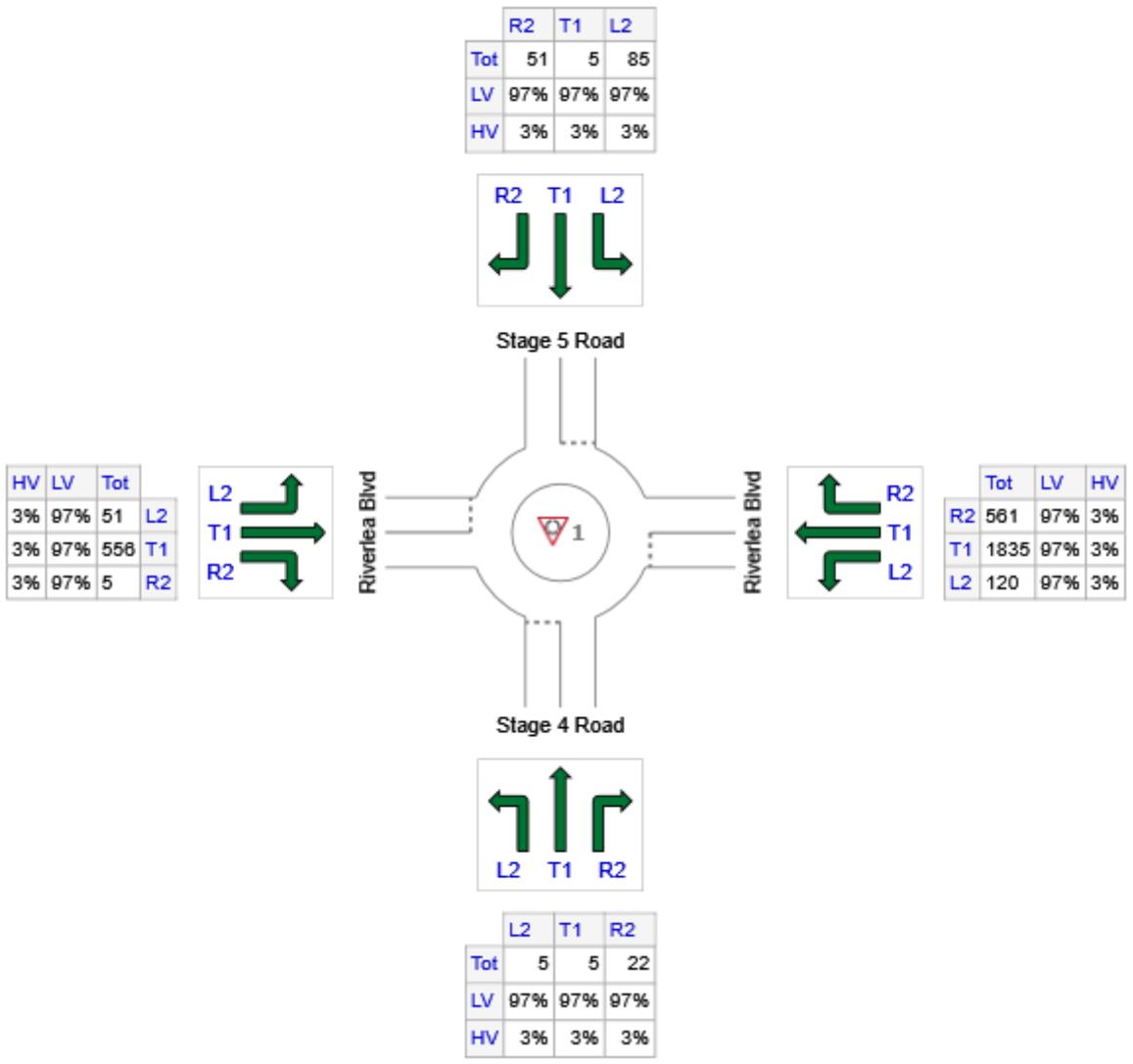
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 1 [Prec2_Int3_Pre2_PM_Trigger (Site Folder: Precinct 2 Update)]

Intersection 3
Trigger Volumes
PM Peak
Site Category: (None)
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: Stage 4 Road	32	31	1
E: Riverlea Blvd	2516	2441	75
N: Stage 5 Road	141	137	4
W: Riverlea Blvd	612	594	18
Total	3301	3202	99

MOVEMENT SUMMARY

Site: 1 [Prec2_Int3_Pre2_PM_Trigger (Site Folder: Precinct 2 Update)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 3
Trigger Volumes
PM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stage 4 Road															
1	L2	All MCs	5	3.0	5	3.0	0.166	18.1	LOS B	0.8	5.5	0.90	0.95	0.90	40.9
2	T1	All MCs	5	3.0	5	3.0	0.166	17.8	LOS B	0.8	5.5	0.90	0.95	0.90	38.9
3	R2	All MCs	23	3.0	23	3.0	0.166	23.3	LOS B	0.8	5.5	0.90	0.95	0.90	40.6
Approach			34	3.0	34	3.0	0.166	21.6	LOS B	0.8	5.5	0.90	0.95	0.90	40.3
East: Riverlea Blvd															
4	L2	All MCs	126	3.0	126	3.0	0.847	4.5	LOS A	18.3	131.6	0.59	0.40	0.59	49.0
5	T1	All MCs	1932	3.0	1932	3.0	0.847	4.4	LOS A	18.3	131.6	0.63	0.43	0.63	52.6
6	R2	All MCs	591	3.0	591	3.0	0.847	10.4	LOS A	17.2	123.1	0.70	0.48	0.70	47.3
Approach			2648	3.0	2648	3.0	0.847	5.8	LOS A	18.3	131.6	0.64	0.44	0.64	51.1
North: Stage 5 Road															
7	L2	All MCs	89	3.0	89	3.0	0.084	4.2	LOS A	0.4	2.6	0.53	0.59	0.53	46.1
8	T1	All MCs	5	3.0	5	3.0	0.084	3.8	LOS A	0.4	2.5	0.53	0.68	0.53	44.8
9	R2	All MCs	54	3.0	54	3.0	0.084	9.3	LOS A	0.4	2.5	0.53	0.68	0.53	47.0
Approach			148	3.0	148	3.0	0.084	6.0	LOS A	0.4	2.6	0.53	0.62	0.53	46.4
West: Riverlea Blvd															
10	L2	All MCs	54	3.0	54	3.0	0.359	6.8	LOS A	2.6	18.5	0.72	0.67	0.72	52.1
11	T1	All MCs	585	3.0	585	3.0	0.359	7.0	LOS A	2.6	18.5	0.72	0.69	0.72	52.5
12	R2	All MCs	5	3.0	5	3.0	0.359	13.2	LOS A	2.3	16.7	0.72	0.71	0.72	48.1
Approach			644	3.0	644	3.0	0.359	7.0	LOS A	2.6	18.5	0.72	0.68	0.72	52.4
All Vehicles			3475	3.0	3475	3.0	0.847	6.2	LOS A	18.3	131.6	0.65	0.50	0.65	51.0

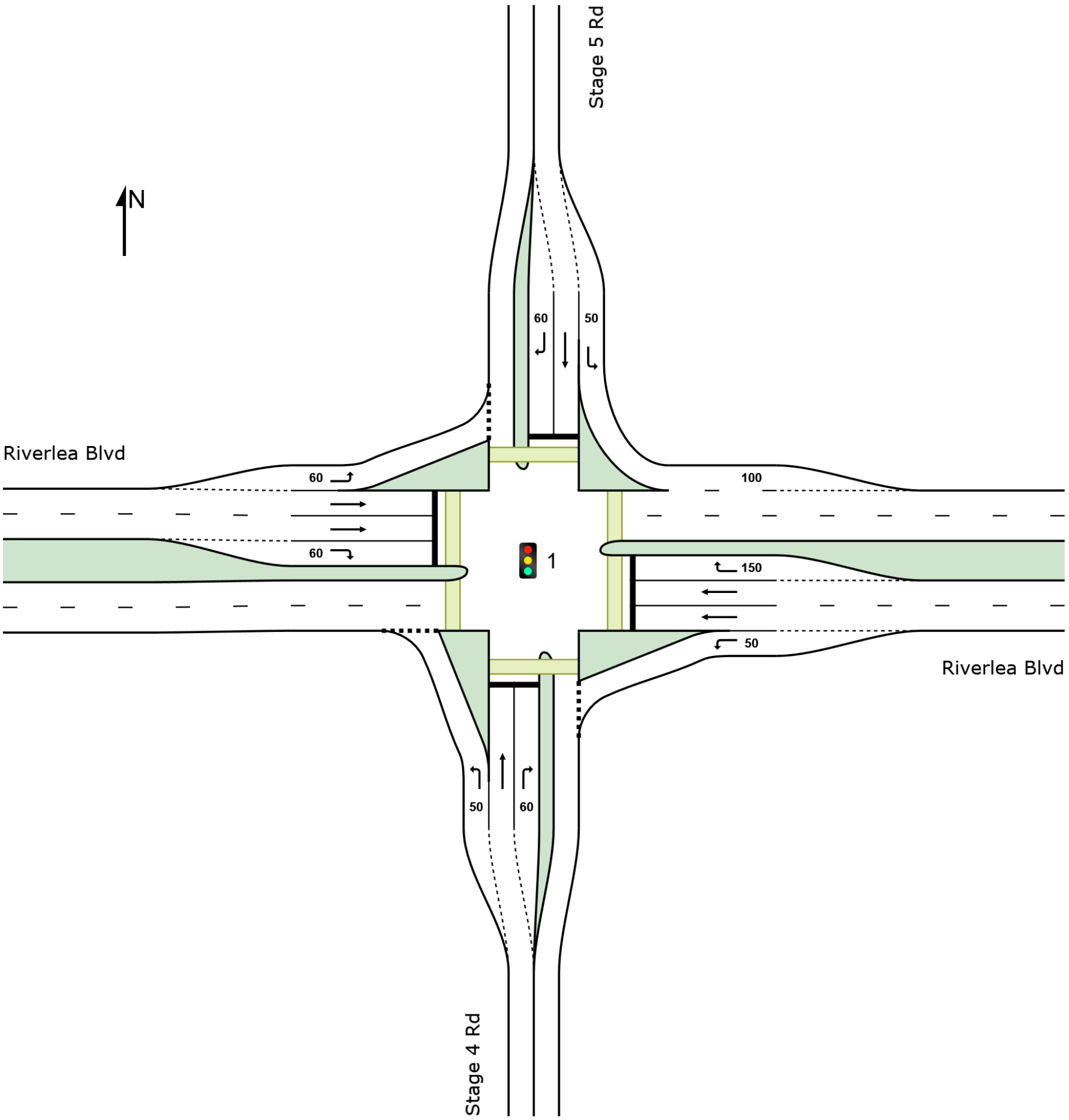
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout 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.

SITE LAYOUT

Site: 1 [Prec2_Int3_Pre2_Ultimate-AM (Site Folder: Precinct 2 Update)]

Intersection 3
Ultimate Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



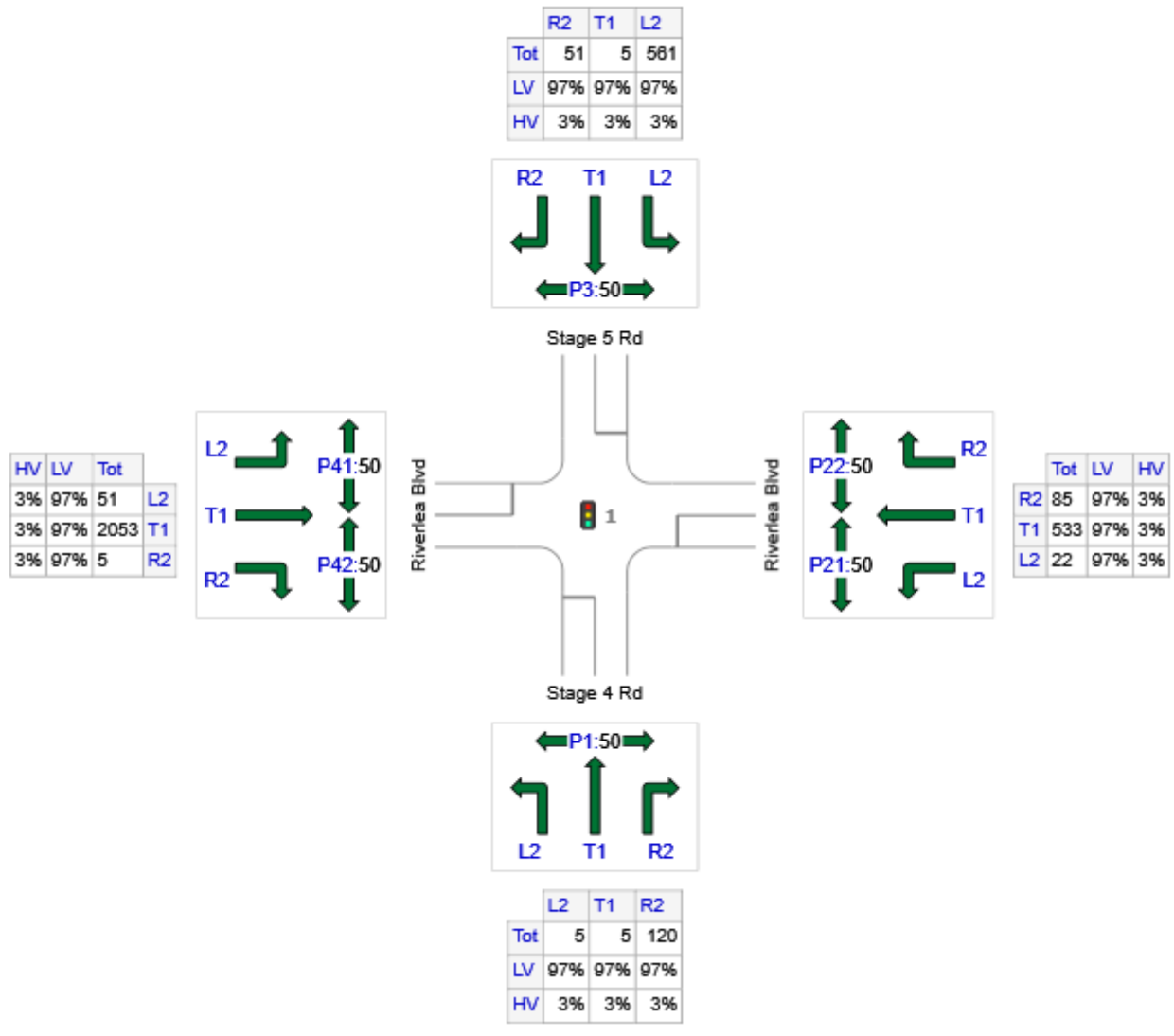
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 1 [Prec2_Int3_Pre2_Ultimate-AM (Site Folder: Precinct 2 Update)]

Intersection 3
Ultimate Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: Stage 4 Rd	130	126	4
E: Riverlea Blvd	640	621	19
N: Stage 5 Rd	617	598	19
W: Riverlea Blvd	2109	2046	63
Total	3496	3391	105

PHASING SUMMARY

Site: 1 [Prec2_Int3_Pre2_Ultimate-AM (Site Folder: Precinct 2 Update)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 3
Ultimate Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 150 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

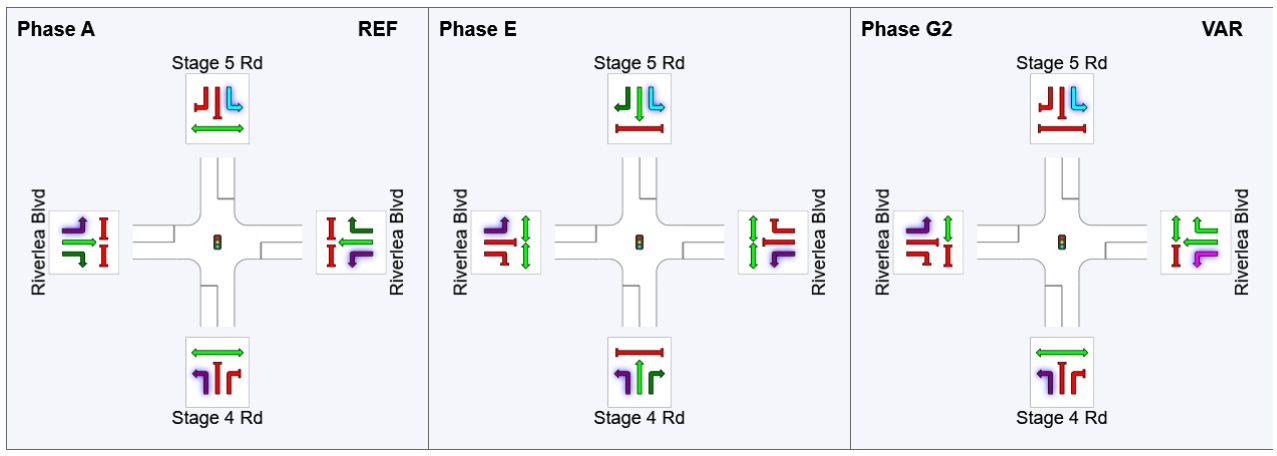
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: DDO - R Filter
Input Phase Sequence: A, D*, D1*, D2*, E, G*, G1*, G2*
Output Phase Sequence: A, E, G2*
Reference Phase: Phase A
(* Variable Phase)

Phase Timing Summary

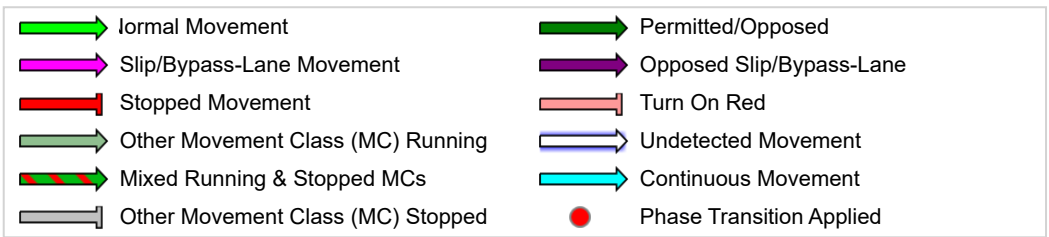
Phase	A	E	G2
Phase Change Time (sec)	0	111	133
Green Time (sec)	103	14	9
Phase Time (sec)	111	22	17
Phase Split	74%	15%	11%
Phase Frequency (%)	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



MOVEMENT SUMMARY

Site: 1 [Prec2_Int3_Pre2_Ultimate-AM (Site Folder: Precinct 2 Update)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 3
Ultimate Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 150 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stage 4 Rd															
1	L2	All MCs	5	3.0	5	3.0	0.006	5.3	LOS A	0.0	0.2	0.14	0.52	0.14	48.9
2	T1	All MCs	5	3.0	5	3.0	0.029	66.8	LOS E	0.4	2.5	0.93	0.61	0.93	26.3
3	R2	All MCs	126	3.0	126	3.0	* 0.851	86.9	LOS F	10.1	72.7	1.00	0.97	1.26	23.5
Approach			137	3.0	137	3.0	0.851	83.0	LOS F	10.1	72.7	0.96	0.94	1.21	24.1
East: Riverlea Blvd															
4	L2	All MCs	23	3.0	23	3.0	0.016	5.7	LOS A	0.0	0.1	0.02	0.55	0.02	49.4
5	T1	All MCs	561	3.0	561	3.0	0.181	0.3	LOS A	0.5	3.5	0.03	0.02	0.03	59.7
6	R2	All MCs	89	3.0	89	3.0	* 0.491	15.3	LOS B	3.2	22.9	0.61	0.74	0.61	43.8
Approach			674	3.0	674	3.0	0.491	2.5	LOS A	3.2	22.9	0.10	0.14	0.10	56.5
North: Stage 5 Rd															
7	L2	All MCs	591	3.0	591	3.0	0.321	23.9	LOS B	0.0	0.0	0.00	0.46	0.00	46.3
8	T1	All MCs	5	3.0	5	3.0	0.029	66.8	LOS E	0.4	2.5	0.93	0.61	0.93	26.3
9	R2	All MCs	54	3.0	54	3.0	0.362	75.6	LOS F	3.8	27.4	0.98	0.76	0.98	25.3
Approach			649	3.0	649	3.0	0.362	28.5	LOS C	3.8	27.4	0.09	0.49	0.09	43.1
West: Riverlea Blvd															
10	L2	All MCs	54	3.0	54	3.0	0.052	11.1	LOS A	0.6	4.0	0.18	0.59	0.18	50.5
11	T1	All MCs	2161	3.0	2161	3.0	* 0.827	5.4	LOS A	26.9	193.3	0.37	0.35	0.37	56.8
12	R2	All MCs	5	3.0	5	3.0	0.010	9.9	LOS A	0.0	0.2	0.09	0.57	0.09	48.0
Approach			2220	3.0	2220	3.0	0.827	5.5	LOS A	26.9	193.3	0.37	0.36	0.37	54.9
All Vehicles			3680	3.0	3680	3.0	0.851	11.9	LOS A	26.9	193.3	0.29	0.36	0.30	50.3

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Stage 4 Rd												
P1	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
East: Riverlea Blvd												
P21	Stage 1	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
P22	Stage 2	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
North: Stage 5 Rd												
P3	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
West: Riverlea Blvd												
P41	Stage 1	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
P42	Stage 2	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
All Pedestrians		300	316	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

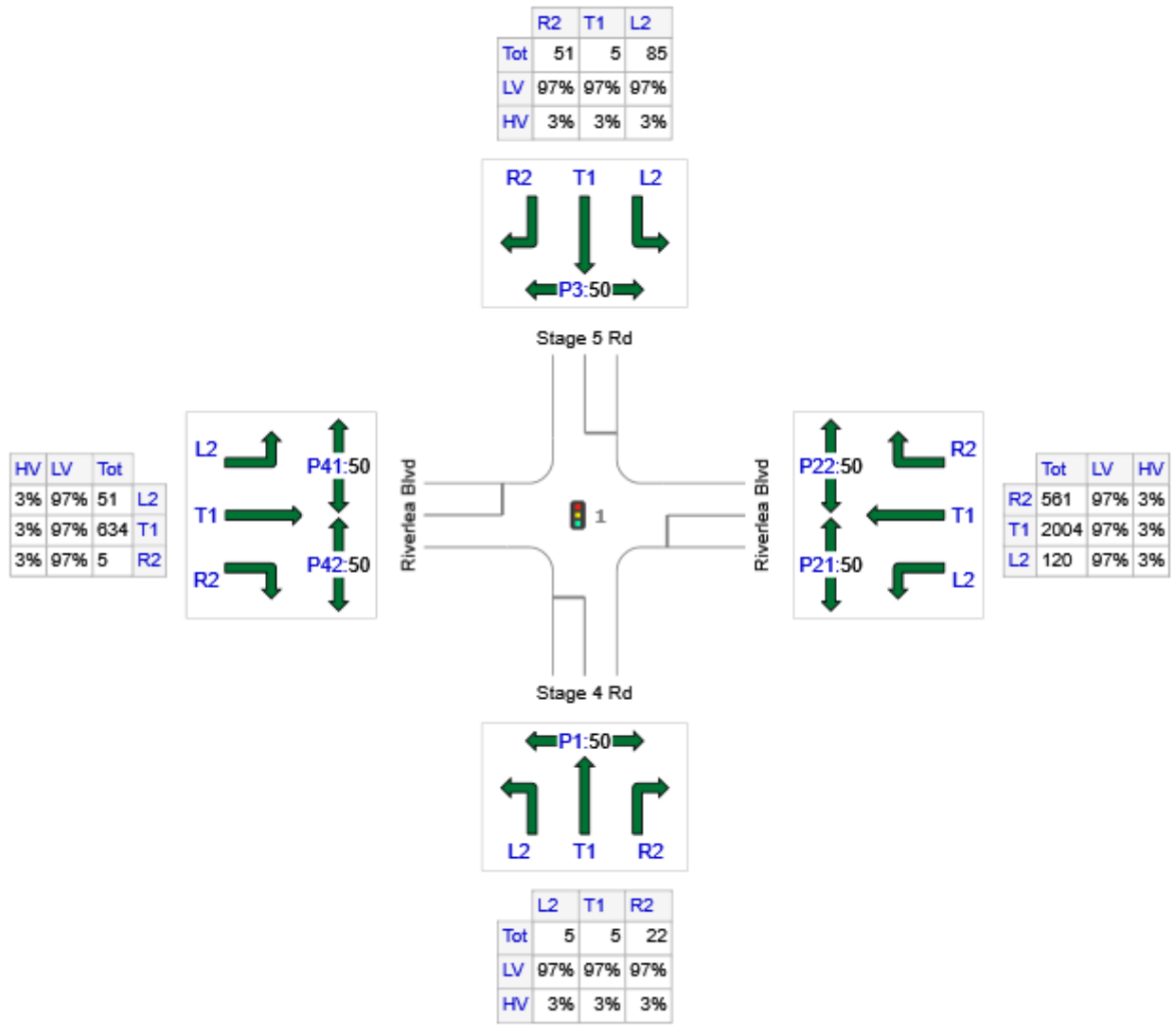
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 1 [Prec2_Int3_Pre2_Ultimate-PM (Site Folder: Precinct 2 Update)]

Intersection 3
Ultimate Volumes
PM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: Stage 4 Rd	32	31	1
E: Riverlea Blvd	2685	2604	81
N: Stage 5 Rd	141	137	4
W: Riverlea Blvd	690	669	21
Total	3548	3442	106

PHASING SUMMARY

Site: 1 [Prec2_Int3_Pre2_Ultimate-PM (Site Folder: Precinct 2 Update)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 3
Ultimate Volumes
PM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 140 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: DDO - R Filter
Input Phase Sequence: A, D*, D1*, D2*, E, G, G1*, G2*
Output Phase Sequence: A, E, G, G2*
Reference Phase: Phase A
(* Variable Phase)

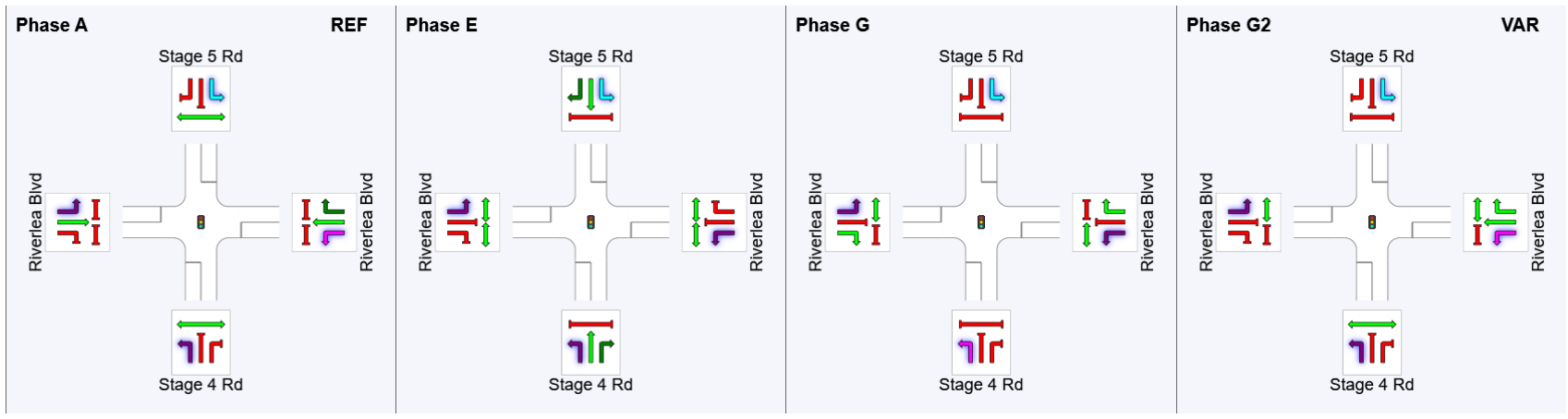
Phase Timing Summary

Phase	A	E	G	G2
Phase Change Time (sec)	0	88	106	120
Green Time (sec)	85	10	6	12
Phase Time (sec)	93	18	14	15
Phase Split	66%	13%	10%	11%
Phase Frequency (%)	100.0	100.0	100.0	34.6[3]

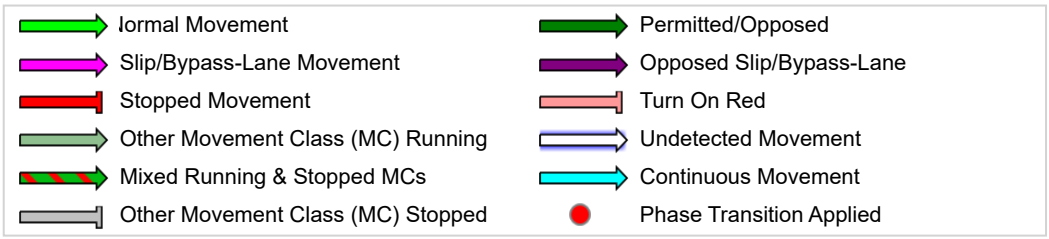
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

3 Phase Frequency has been estimated from actuated movement movement probabilities.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



MOVEMENT SUMMARY

Site: 1 [Prec2_Int3_Pre2_Ultimate-PM (Site Folder: Precinct 2 Update)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 3
Ultimate Volumes
PM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 140 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stage 4 Rd															
1	L2	All MCs	5	3.0	5	3.0	0.016	6.9	LOS A	0.1	0.4	0.25	0.55	0.25	47.8
2	T1	All MCs	5	3.0	5	3.0	0.038	66.3	LOS E	0.3	2.4	0.95	0.62	0.95	26.4
3	R2	All MCs	23	3.0	23	3.0	0.192	73.1	LOS F	1.6	11.1	0.97	0.71	0.97	25.7
Approach			34	3.0	34	3.0	0.192	61.7	LOS E	1.6	11.1	0.86	0.67	0.86	27.9
East: Riverlea Blvd															
4	L2	All MCs	126	3.0	126	3.0	0.079	5.8	LOS A	0.1	0.7	0.02	0.55	0.02	49.3
5	T1	All MCs	2109	3.0	2109	3.0	* 0.765	1.4	LOS A	12.4	89.3	0.19	0.18	0.19	58.7
6	R2	All MCs	591	3.0	591	3.0	0.761	5.9	LOS A	1.5	11.1	0.08	0.56	0.08	49.2
Approach			2826	3.0	2826	3.0	0.765	2.5	LOS A	12.4	89.3	0.16	0.28	0.16	56.0
North: Stage 5 Rd															
7	L2	All MCs	89	3.0	89	3.0	0.049	5.1	LOS A	0.0	0.0	0.00	0.47	0.00	46.4
8	T1	All MCs	5	3.0	5	3.0	0.038	66.3	LOS E	0.3	2.4	0.95	0.62	0.95	26.4
9	R2	All MCs	54	3.0	54	3.0	* 0.446	75.0	LOS F	3.7	26.5	1.00	0.75	1.00	25.4
Approach			148	3.0	148	3.0	0.446	32.5	LOS C	3.7	26.5	0.39	0.58	0.39	35.0
West: Riverlea Blvd															
10	L2	All MCs	54	3.0	54	3.0	0.058	5.7	LOS A	0.0	0.3	0.02	0.55	0.02	53.0
11	T1	All MCs	667	3.0	667	3.0	0.284	6.1	LOS A	5.5	39.5	0.27	0.23	0.27	54.6
12	R2	All MCs	5	3.0	5	3.0	* 0.067	77.0	LOS F	0.4	2.6	0.97	0.64	0.97	25.2
Approach			726	3.0	726	3.0	0.284	6.6	LOS A	5.5	39.5	0.25	0.26	0.25	54.0
All Vehicles			3735	3.0	3735	3.0	0.765	5.0	LOS A	12.4	89.3	0.19	0.29	0.19	53.8

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Stage 4 Rd												
P1	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	79.7	20.0	0.25
East: Riverlea Blvd												
P21	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	79.7	20.0	0.25
P22	Stage 2	50	53	38.6	LOS D	0.1	0.1	0.92	0.92	54.0	20.0	0.37
North: Stage 5 Rd												
P3	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	79.7	20.0	0.25
West: Riverlea Blvd												
P41	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	79.7	20.0	0.25
P42	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	79.7	20.0	0.25
All Pedestrians		300	316	60.0	LOS E	0.2	0.2	0.95	0.95	75.4	20.0	0.27

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

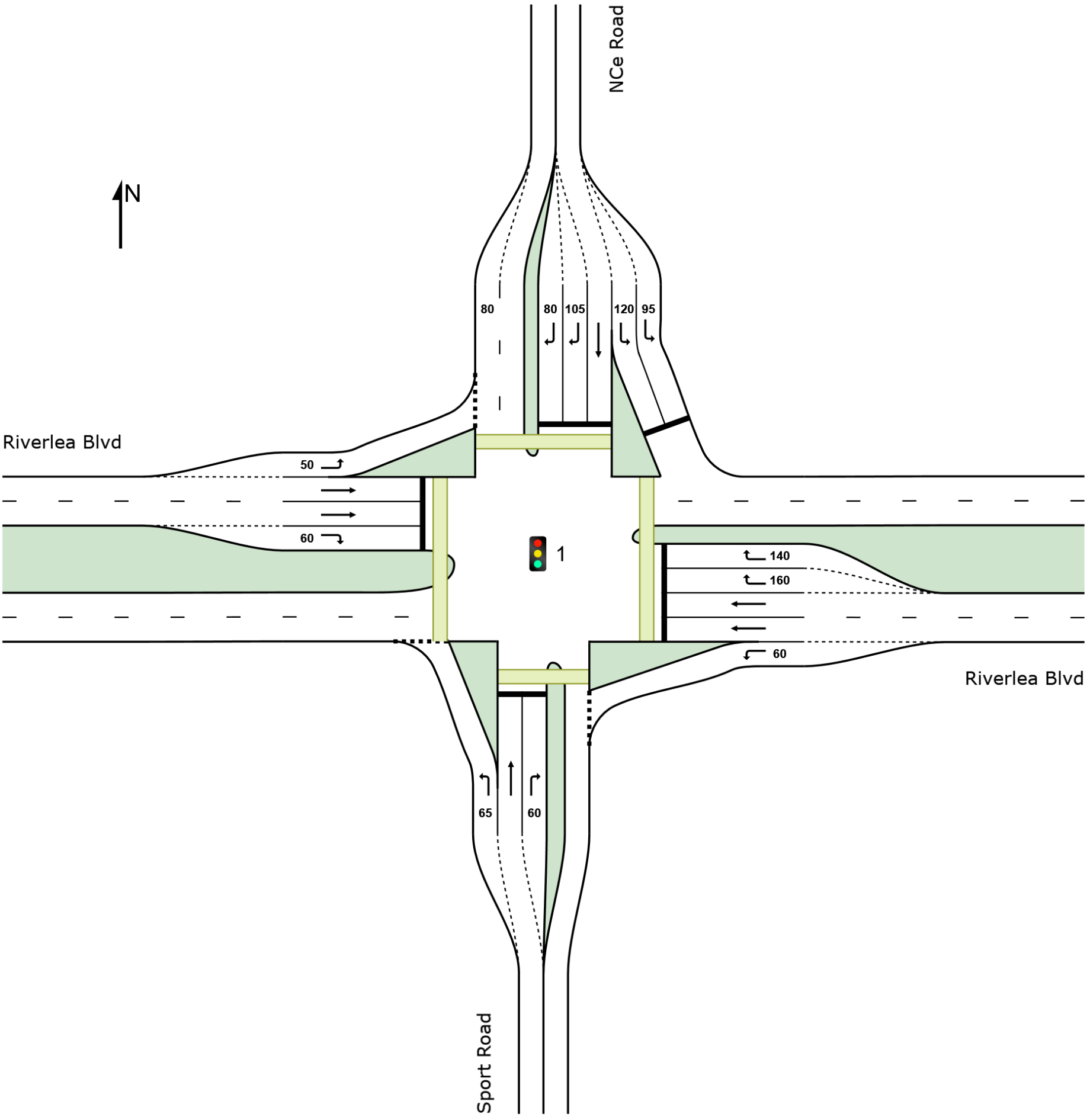
Appendix C Intersection 5 SIDRA Summary

SITE LAYOUT

Site: 1 [Prec2_Int_5_Pre2_AM_Signals (Site Folder: Precinct 2 Update)]

Intersection 5
Precinct 2 Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



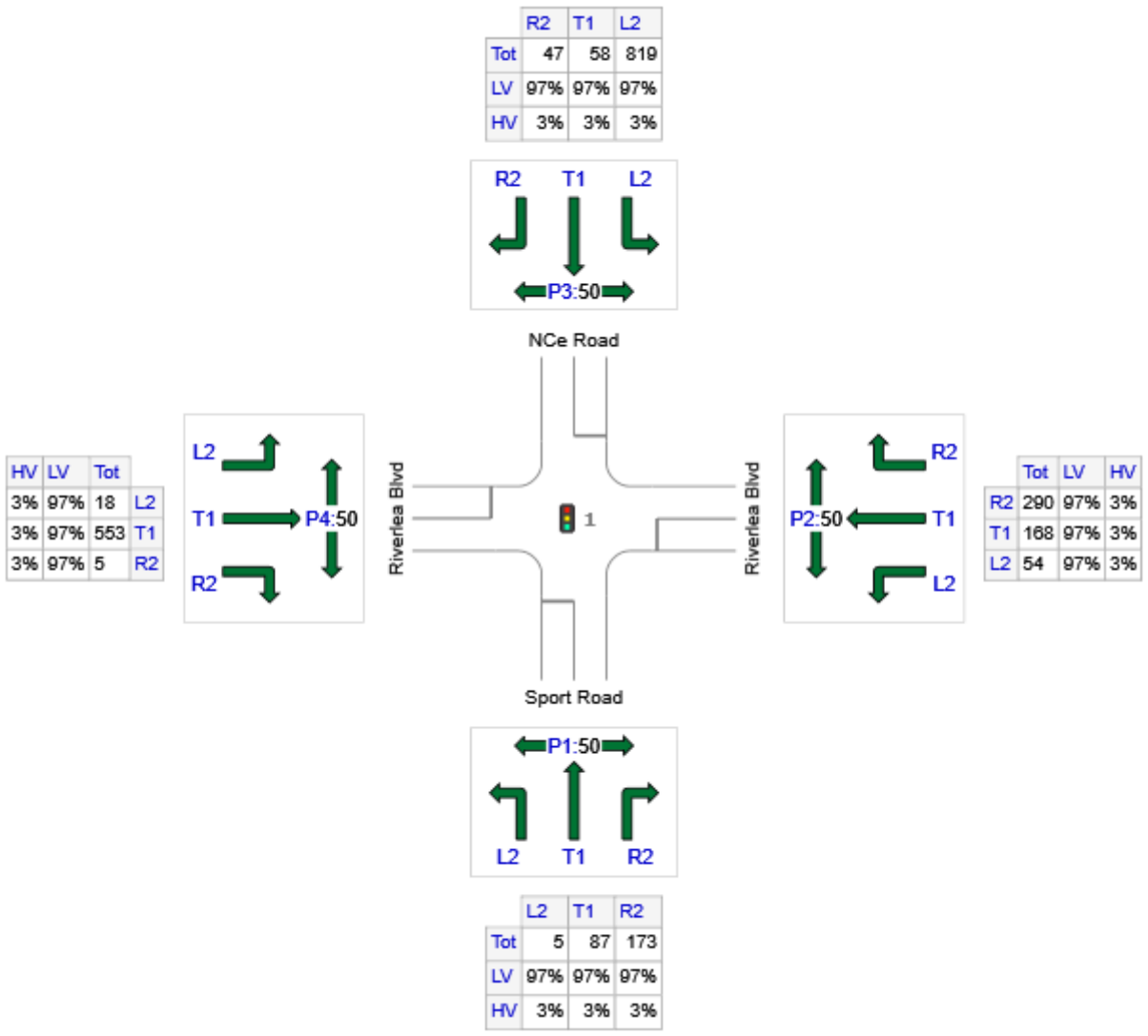
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 1 [Prec2_Int_5_Pre2_AM_Signals (Site Folder: Precinct 2 Update)]

Intersection 5
Precinct 2 Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: Sport Road	265	257	8
E: Riverlea Blvd	512	497	15
N: NCe Road	924	896	28
W: Riverlea Blvd	576	559	17
Total	2277	2209	68

PHASING SUMMARY

Site: 1 [Prec2_Int_5_Pre2_AM_Signals (Site Folder: Precinct 2 Update)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 5
Precinct 2 Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

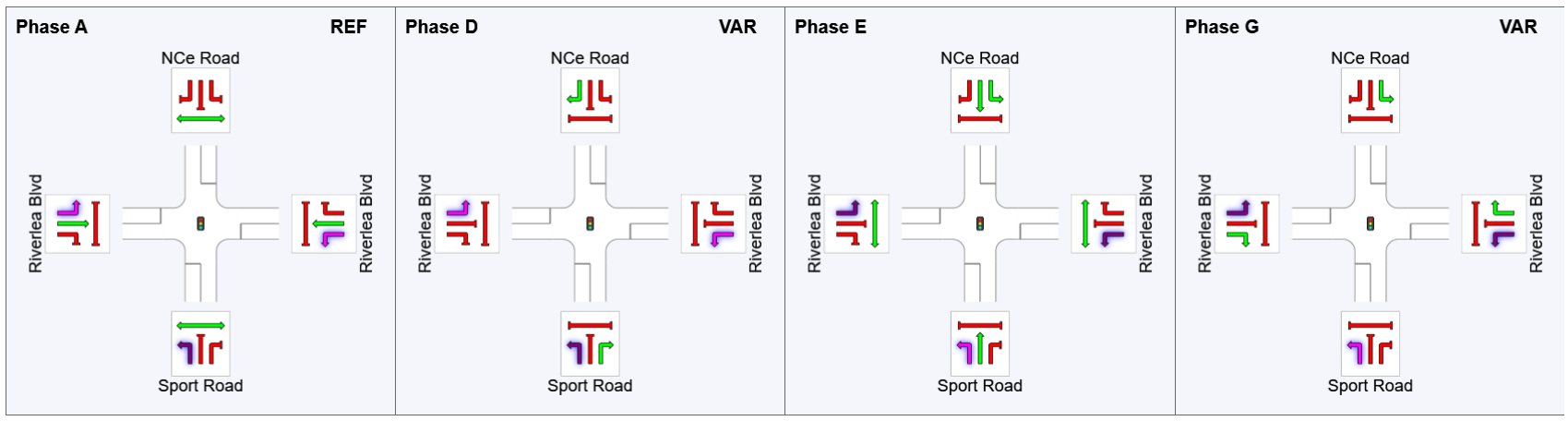
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: DDO
Input Phase Sequence: A, D*, D1*, D2*, E, G*, G1*, G2*
Output Phase Sequence: A, D*, E, G*
Reference Phase: Phase A
(* Variable Phase)

Phase Timing Summary

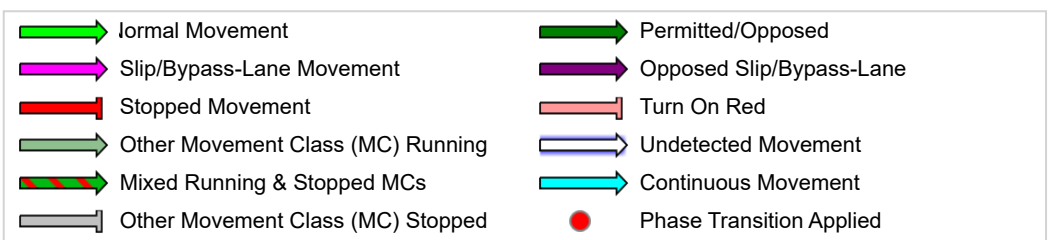
Phase	A	D	E	G
Phase Change Time (sec)	0	27	47	78
Green Time (sec)	19	12	23	34
Phase Time (sec)	27	20	31	42
Phase Split	23%	17%	26%	35%
Phase Frequency (%)	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



MOVEMENT SUMMARY

Site: 1 [Prec2_Int_5_Pre2_AM_Signals (Site Folder: Precinct 2 Update)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 5
Precinct 2 Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Sport Road															
1	L2	All MCs	5	3.0	5	3.0	0.004	9.6	LOS A	0.1	0.6	0.35	0.56	0.35	46.2
2	T1	All MCs	92	3.0	92	3.0	* 0.206	44.6	LOS D	4.6	33.0	0.89	0.70	0.89	31.2
3	R2	All MCs	182	3.0	182	3.0	* 0.826	70.3	LOS E	11.8	85.3	1.00	0.98	1.21	26.3
Approach			279	3.0	279	3.0	0.826	60.7	LOS E	11.8	85.3	0.95	0.88	1.09	28.0
East: Riverlea Blvd															
4	L2	All MCs	57	3.0	57	3.0	0.040	9.7	LOS A	0.8	5.7	0.34	0.63	0.34	46.9
5	T1	All MCs	177	3.0	177	3.0	0.241	48.6	LOS D	4.6	33.4	0.92	0.72	0.92	33.6
6	R2	All MCs	305	3.0	305	3.0	* 0.780	65.3	LOS E	12.6	90.9	0.99	0.88	1.08	27.6
Approach			539	3.0	539	3.0	0.780	54.0	LOS D	12.6	90.9	0.90	0.80	0.95	30.7
North: NCe Road															
7	L2	All MCs	862	3.0	862	3.0	0.521	37.4	LOS C	20.5	148.0	0.88	0.83	0.88	32.7
8	T1	All MCs	61	3.0	61	3.0	0.137	43.7	LOS D	3.0	21.6	0.87	0.67	0.87	31.5
9	R2	All MCs	49	3.0	49	3.0	0.112	58.9	LOS E	1.4	9.8	0.94	0.71	0.94	28.7
Approach			973	3.0	973	3.0	0.521	38.9	LOS C	20.5	148.0	0.88	0.81	0.88	32.4
West: Riverlea Blvd															
10	L2	All MCs	19	3.0	19	3.0	0.015	15.0	LOS B	0.3	1.9	0.44	0.63	0.44	49.1
11	T1	All MCs	582	3.0	582	3.0	* 0.795	60.5	LOS E	18.2	131.1	1.00	0.96	1.11	30.8
12	R2	All MCs	5	3.0	5	3.0	0.020	56.5	LOS E	0.3	2.0	0.91	0.65	0.91	29.4
Approach			606	3.0	606	3.0	0.795	59.1	LOS E	18.2	131.1	0.98	0.94	1.09	30.6
All Vehicles			2397	3.0	2397	3.0	0.826	49.9	LOS D	20.5	148.0	0.92	0.85	0.97	31.0

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Sport Road												
P1	Full	50	53	36.9	LOS D	0.1	0.1	0.95	0.95	52.3	20.0	0.38
East: Riverlea Blvd												
P2	Full	50	53	36.9	LOS D	0.1	0.1	0.95	0.95	52.3	20.0	0.38
North: NCe Road												
P3	Full	50	53	36.9	LOS D	0.1	0.1	0.95	0.95	52.3	20.0	0.38
West: Riverlea Blvd												
P4	Full	50	53	36.9	LOS D	0.1	0.1	0.95	0.95	52.3	20.0	0.38
All Pedestrians		200	211	36.9	LOS D	0.1	0.1	0.95	0.95	52.3	20.0	0.38

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

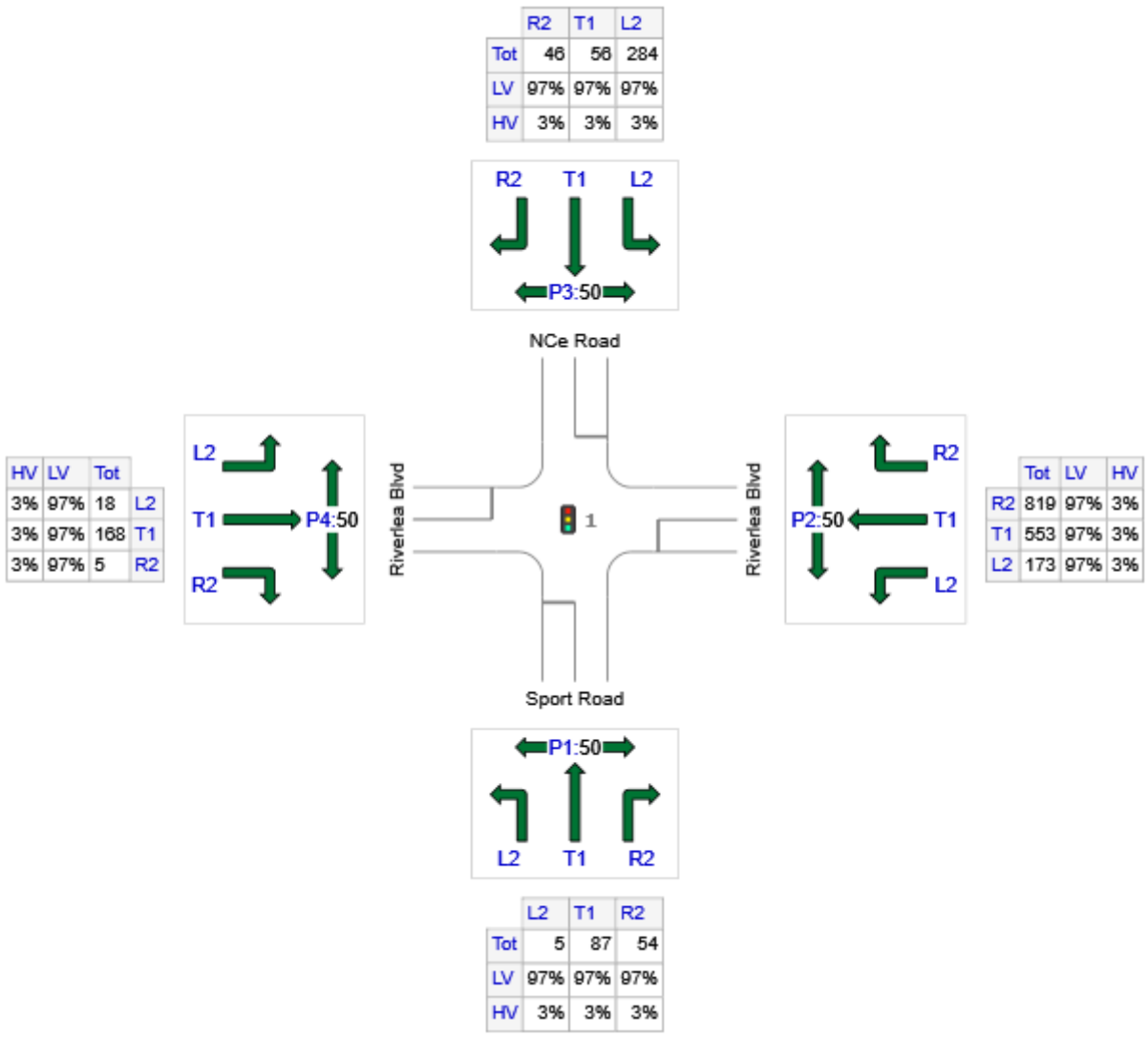
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 1 [Prec2_Int_5_Pre2_PM_Signals (Site Folder: Precinct 2 Update)]

Intersection 5
Precinct 2 Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: Sport Road	146	142	4
E: Riverlea Blvd	1545	1499	46
N: NCe Road	386	374	12
W: Riverlea Blvd	191	185	6
Total	2268	2200	68

PHASING SUMMARY

Site: 1 [Prec2_Int_5_Pre2_PM_Signals (Site Folder: Precinct 2 Update)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 5
Precinct 2 Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

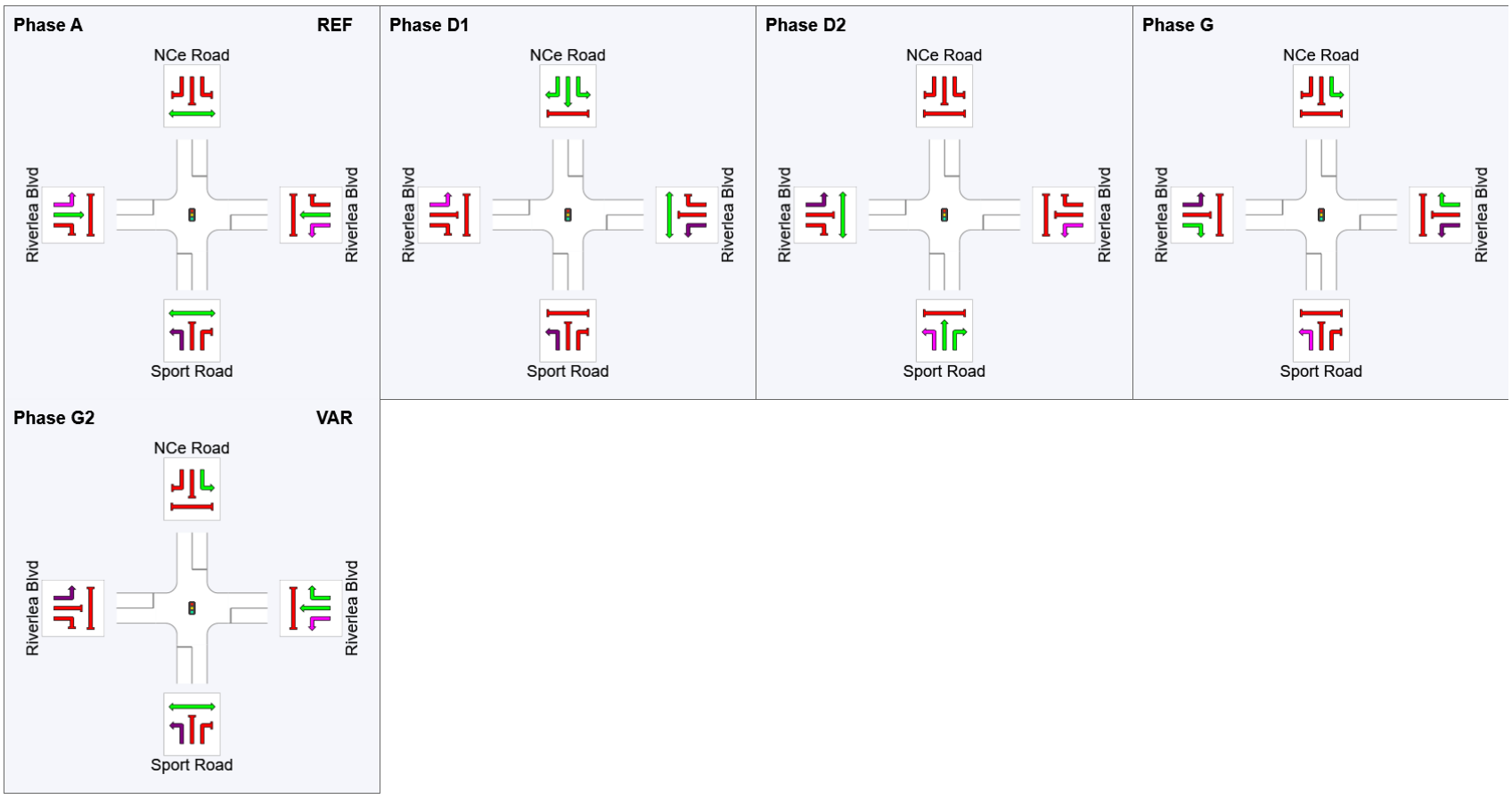
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: SDO
Input Phase Sequence: A, D1, D2, G, G1*, G2*
Output Phase Sequence: A, D1, D2, G, G2*
Reference Phase: Phase A
(* Variable Phase)

Phase Timing Summary

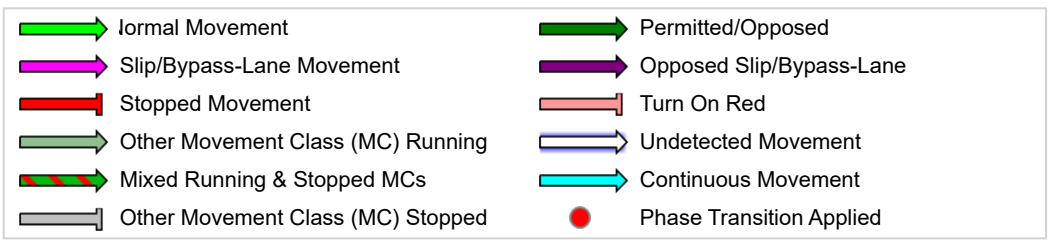
Phase	A	D1	D2	G	G2
Phase Change Time (sec)	0	26	55	84	98
Green Time (sec)	18	21	21	6	44
Phase Time (sec)	26	29	29	14	52
Phase Split	17%	19%	19%	9%	35%
Phase Frequency (%)	100.0	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



MOVEMENT SUMMARY

Site: 1 [Prec2_Int_5_Pre2_PM_Signals (Site Folder: Precinct 2 Update)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 5
Precinct 2 Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Sport Road															
1	L2	All MCs	5	3.0	5	3.0	0.004	6.6	LOS A	0.1	0.4	0.21	0.53	0.21	48.0
2	T1	All MCs	92	3.0	92	3.0	* 0.338	63.3	LOS E	6.1	44.1	0.95	0.74	0.95	27.0
3	R2	All MCs	57	3.0	57	3.0	0.221	66.6	LOS E	3.7	26.9	0.93	0.74	0.93	27.0
Approach			154	3.0	154	3.0	0.338	62.6	LOS E	6.1	44.1	0.91	0.74	0.91	27.4
East: Riverlea Blvd															
4	L2	All MCs	182	3.0	182	3.0	0.117	6.5	LOS A	1.2	8.4	0.16	0.59	0.16	48.9
5	T1	All MCs	582	3.0	582	3.0	0.323	26.5	LOS B	13.1	94.4	0.67	0.58	0.67	42.0
6	R2	All MCs	862	3.0	862	3.0	* 0.818	50.4	LOS D	37.4	269.4	0.90	0.86	0.92	31.6
Approach			1626	3.0	1626	3.0	0.818	36.9	LOS C	37.4	269.4	0.74	0.73	0.75	35.8
North: NCe Road															
7	L2	All MCs	299	3.0	299	3.0	* 0.154	14.4	LOS A	2.9	20.8	0.54	0.67	0.54	41.1
8	T1	All MCs	59	3.0	59	3.0	0.218	62.0	LOS E	3.9	27.8	0.93	0.71	0.93	27.2
9	R2	All MCs	48	3.0	48	3.0	0.094	65.1	LOS E	1.5	11.2	0.90	0.70	0.90	27.4
Approach			406	3.0	406	3.0	0.218	27.3	LOS B	3.9	27.8	0.64	0.68	0.64	36.3
West: Riverlea Blvd															
10	L2	All MCs	19	3.0	19	3.0	0.021	17.6	LOS B	0.5	3.8	0.46	0.63	0.46	45.2
11	T1	All MCs	177	3.0	177	3.0	* 0.381	66.6	LOS E	6.1	43.8	0.97	0.76	0.97	28.9
12	R2	All MCs	5	3.0	5	3.0	0.072	83.8	LOS F	0.4	2.8	0.99	0.65	0.99	24.2
Approach			201	3.0	201	3.0	0.381	62.4	LOS E	6.1	43.8	0.92	0.74	0.92	29.7
All Vehicles			2387	3.0	2387	3.0	0.818	39.1	LOS C	37.4	269.4	0.75	0.72	0.75	34.6

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Sport Road												
P1	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
East: Riverlea Blvd												
P2	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
North: NCe Road												
P3	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
West: Riverlea Blvd												
P4	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
All Pedestrians		200	211	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

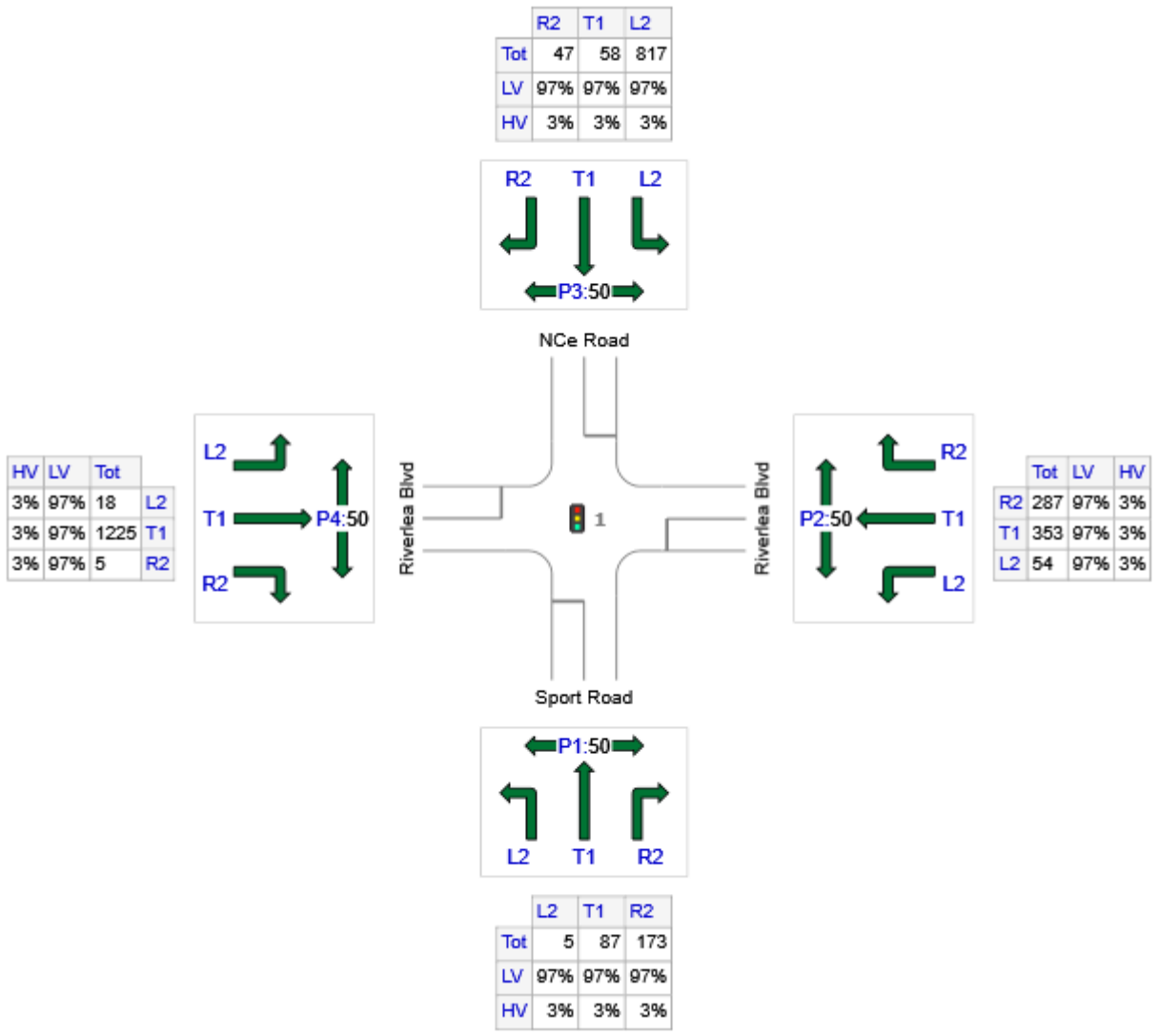
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 1 [Prec2_Int_5_Pre2_AM_Signals-Ultimate (Site Folder: Precinct 2 Update)]

Intersection 5
Precinct 2 Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: Sport Road	265	257	8
E: Riverlea Blvd	694	673	21
N: NCe Road	922	894	28
W: Riverlea Blvd	1248	1211	37
Total	3129	3035	94

PHASING SUMMARY

Site: 1 [Prec2_Int_5_Pre2_AM_Signals-Ultimate (Site Folder: Precinct 2 Update)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 5
Precinct 2 Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 145 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

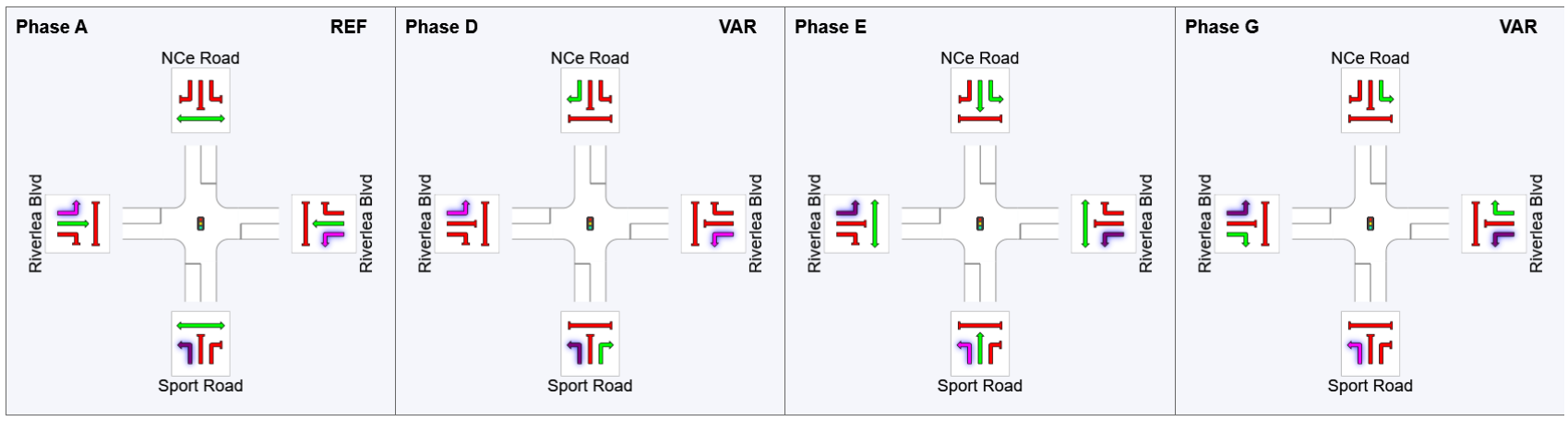
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: DDO
Input Phase Sequence: A, D*, D1*, D2*, E, G*, G1*, G2*
Output Phase Sequence: A, D*, E, G*
Reference Phase: Phase A
(* Variable Phase)

Phase Timing Summary

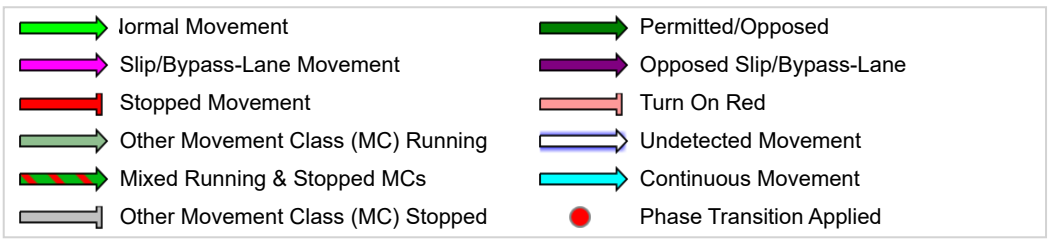
Phase	A	D	E	G
Phase Change Time (sec)	0	63	88	119
Green Time (sec)	55	17	23	18
Phase Time (sec)	63	25	31	26
Phase Split	43%	17%	21%	18%
Phase Frequency (%)	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



MOVEMENT SUMMARY

Site: 1 [Prec2_Int_5_Pre2_AM_Signals-Ultimate (Site Folder: Precinct 2 Update)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 5
Precinct 2 Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 145 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Sport Road															
1	L2	All MCs	5	3.0	5	3.0	0.004	6.1	LOS A	0.0	0.3	0.19	0.53	0.19	48.4
2	T1	All MCs	92	3.0	92	3.0	* 0.299	58.4	LOS E	5.8	41.6	0.93	0.73	0.93	28.0
3	R2	All MCs	182	3.0	182	3.0	* 0.845	80.3	LOS F	13.8	99.7	1.00	0.96	1.21	24.6
Approach			279	3.0	279	3.0	0.845	71.7	LOS F	13.8	99.7	0.96	0.88	1.10	25.9
East: Riverlea Blvd															
4	L2	All MCs	57	3.0	57	3.0	0.037	6.4	LOS A	0.3	2.5	0.15	0.58	0.15	48.9
5	T1	All MCs	372	3.0	372	3.0	0.253	32.7	LOS C	8.9	64.0	0.73	0.61	0.73	39.2
6	R2	All MCs	302	3.0	302	3.0	* 0.871	78.8	LOS F	15.4	110.8	0.99	0.91	1.15	25.1
Approach			731	3.0	731	3.0	0.871	49.7	LOS D	15.4	110.8	0.79	0.73	0.86	32.2
North: NCe Road															
7	L2	All MCs	860	3.0	860	3.0	0.806	59.7	LOS E	28.7	206.9	0.98	0.90	1.03	28.4
8	T1	All MCs	61	3.0	61	3.0	0.199	57.3	LOS E	3.8	27.2	0.91	0.70	0.91	28.2
9	R2	All MCs	49	3.0	49	3.0	0.115	66.8	LOS E	1.6	11.4	0.93	0.71	0.93	27.0
Approach			971	3.0	971	3.0	0.806	59.9	LOS E	28.7	206.9	0.97	0.88	1.01	27.3
West: Riverlea Blvd															
10	L2	All MCs	19	3.0	19	3.0	0.014	39.0	LOS C	0.3	1.9	0.27	0.60	0.27	50.6
11	T1	All MCs	1289	3.0	1289	3.0	* 0.892	83.3	LOS F	47.3	341.3	1.00	1.00	1.10	31.9
12	R2	All MCs	5	3.0	5	3.0	0.023	93.4	LOS F	0.3	2.4	0.90	0.65	0.90	27.5
Approach			1314	3.0	1314	3.0	0.892	82.7	LOS F	47.3	341.3	0.99	0.99	1.09	25.6
All Vehicles			3294	3.0	3294	3.0	0.892	67.7	LOS E	47.3	341.3	0.94	0.89	1.02	27.4

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Sport Road												
P1	Full	50	53	66.8	LOS F	0.2	0.2	0.96	0.96	82.2	20.0	0.24
East: Riverlea Blvd												
P2	Full	50	53	66.8	LOS F	0.2	0.2	0.96	0.96	82.2	20.0	0.24
North: NCe Road												
P3	Full	50	53	66.8	LOS F	0.2	0.2	0.96	0.96	82.2	20.0	0.24
West: Riverlea Blvd												
P4	Full	50	53	66.8	LOS F	0.2	0.2	0.96	0.96	82.2	20.0	0.24
All Pedestrians		200	211	66.8	LOS F	0.2	0.2	0.96	0.96	82.2	20.0	0.24

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

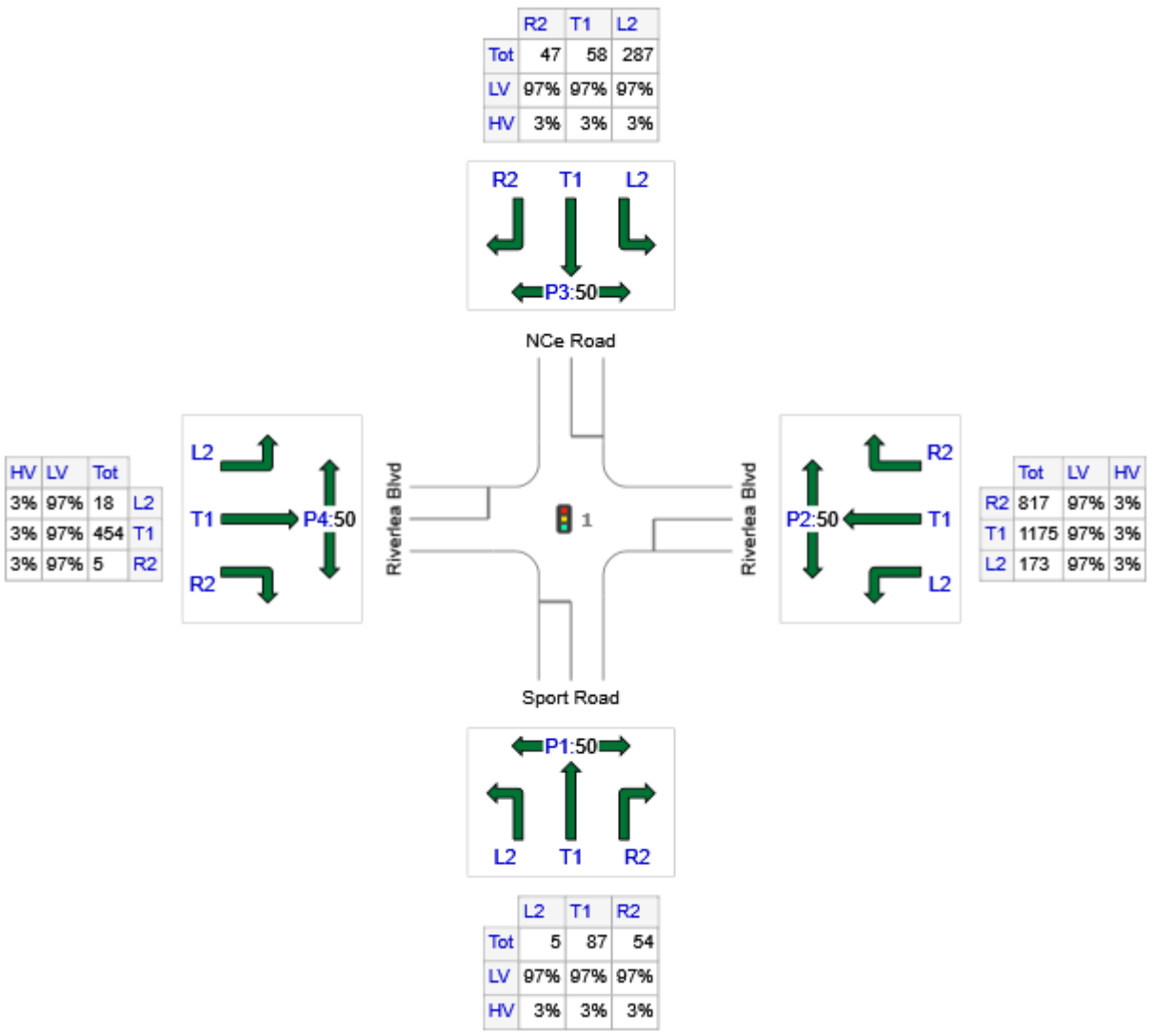
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 1 [Prec2_Int_5_Pre2_PM_Signals-Ultimate (Site Folder: Precinct 2 Update)]

Intersection 5
Precinct 2 Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: Sport Road	146	142	4
E: Riverlea Blvd	2165	2100	65
N: NCe Road	392	380	12
W: Riverlea Blvd	477	463	14
Total	3180	3085	95

PHASING SUMMARY

Site: 1 [Prec2_Int_5_Pre2_PM_Signals-Ultimate (Site Folder: Precinct 2 Update)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 5
Precinct 2 Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

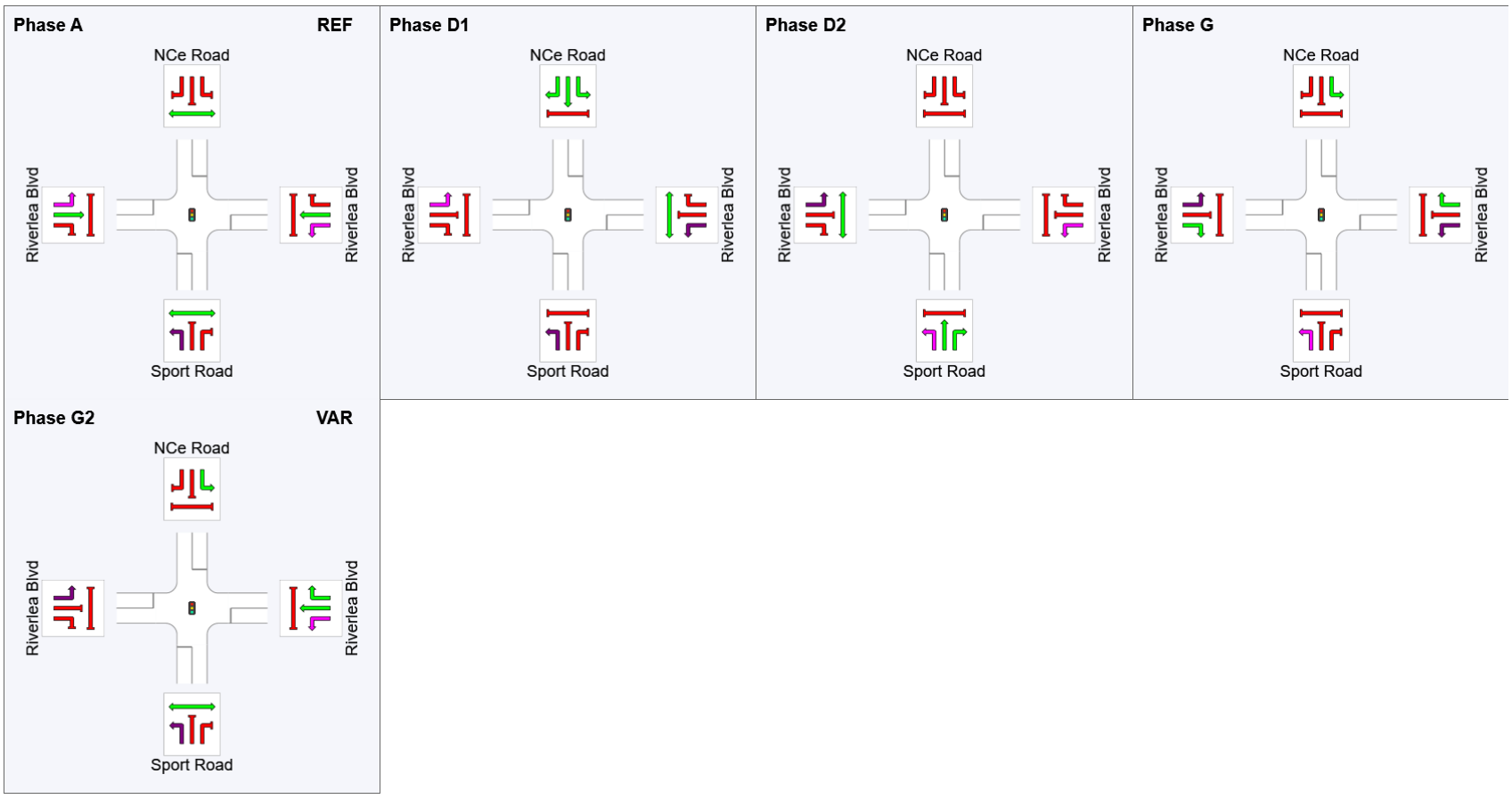
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: SDO
Input Phase Sequence: A, D1, D2, G, G1*, G2*
Output Phase Sequence: A, D1, D2, G, G2*
Reference Phase: Phase A
(* Variable Phase)

Phase Timing Summary

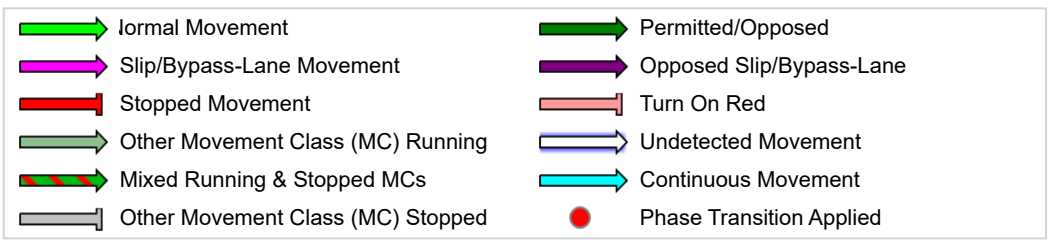
Phase	A	D1	D2	G	G2
Phase Change Time (sec)	0	30	59	88	102
Green Time (sec)	22	21	21	6	40
Phase Time (sec)	30	29	29	14	48
Phase Split	20%	19%	19%	9%	32%
Phase Frequency (%)	100.0	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



MOVEMENT SUMMARY

Site: 1 [Prec2_Int_5_Pre2_PM_Signals-Ultimate (Site Folder: Precinct 2 Update)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 5
Precinct 2 Volumes
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Sport Road															
1	L2	All MCs	5	3.0	5	3.0	0.005	14.6	LOS B	0.1	1.0	0.42	0.57	0.42	43.5
2	T1	All MCs	92	3.0	92	3.0	* 0.338	63.3	LOS E	6.1	44.1	0.95	0.74	0.95	27.0
3	R2	All MCs	57	3.0	57	3.0	0.221	66.6	LOS E	3.7	26.9	0.93	0.74	0.93	27.0
Approach			154	3.0	154	3.0	0.338	62.9	LOS E	6.1	44.1	0.92	0.74	0.92	27.4
East: Riverlea Blvd															
4	L2	All MCs	182	3.0	182	3.0	0.117	24.0	LOS B	1.2	8.4	0.16	0.59	0.16	48.9
5	T1	All MCs	1237	3.0	1237	3.0	0.755	43.4	LOS D	39.7	286.4	0.89	0.80	0.89	38.4
6	R2	All MCs	860	3.0	860	3.0	* 0.887	60.9	LOS E	42.1	303.7	0.94	0.91	1.01	29.3
Approach			2279	3.0	2279	3.0	0.887	48.4	LOS D	42.1	303.7	0.85	0.83	0.88	32.6
North: NCe Road															
7	L2	All MCs	302	3.0	302	3.0	* 0.164	15.5	LOS B	3.1	22.4	0.58	0.68	0.58	40.6
8	T1	All MCs	61	3.0	61	3.0	0.226	62.1	LOS E	4.0	28.8	0.93	0.71	0.93	27.2
9	R2	All MCs	49	3.0	49	3.0	0.096	65.1	LOS E	1.6	11.4	0.90	0.70	0.90	27.4
Approach			413	3.0	413	3.0	0.226	28.4	LOS B	4.0	28.8	0.67	0.69	0.67	35.9
West: Riverlea Blvd															
10	L2	All MCs	19	3.0	19	3.0	0.020	35.7	LOS C	0.6	4.0	0.47	0.63	0.47	44.8
11	T1	All MCs	478	3.0	478	3.0	* 0.855	88.7	LOS F	18.8	135.4	1.00	0.98	1.18	27.0
12	R2	All MCs	5	3.0	5	3.0	0.072	93.2	LOS F	0.4	2.8	0.99	0.65	0.99	24.2
Approach			502	3.0	502	3.0	0.855	86.8	LOS F	18.8	135.4	0.98	0.96	1.15	24.9
All Vehicles			3347	3.0	3347	3.0	0.887	52.4	LOS D	42.1	303.7	0.85	0.83	0.89	31.2

Site Level of Service (LOS) Method: Delay (RTA NSW). 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)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Sport Road												
P1	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
East: Riverlea Blvd												
P2	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
North: NCe Road												
P3	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
West: Riverlea Blvd												
P4	Full	50	53	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24
All Pedestrians		200	211	69.3	LOS F	0.2	0.2	0.96	0.96	84.7	20.0	0.24

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

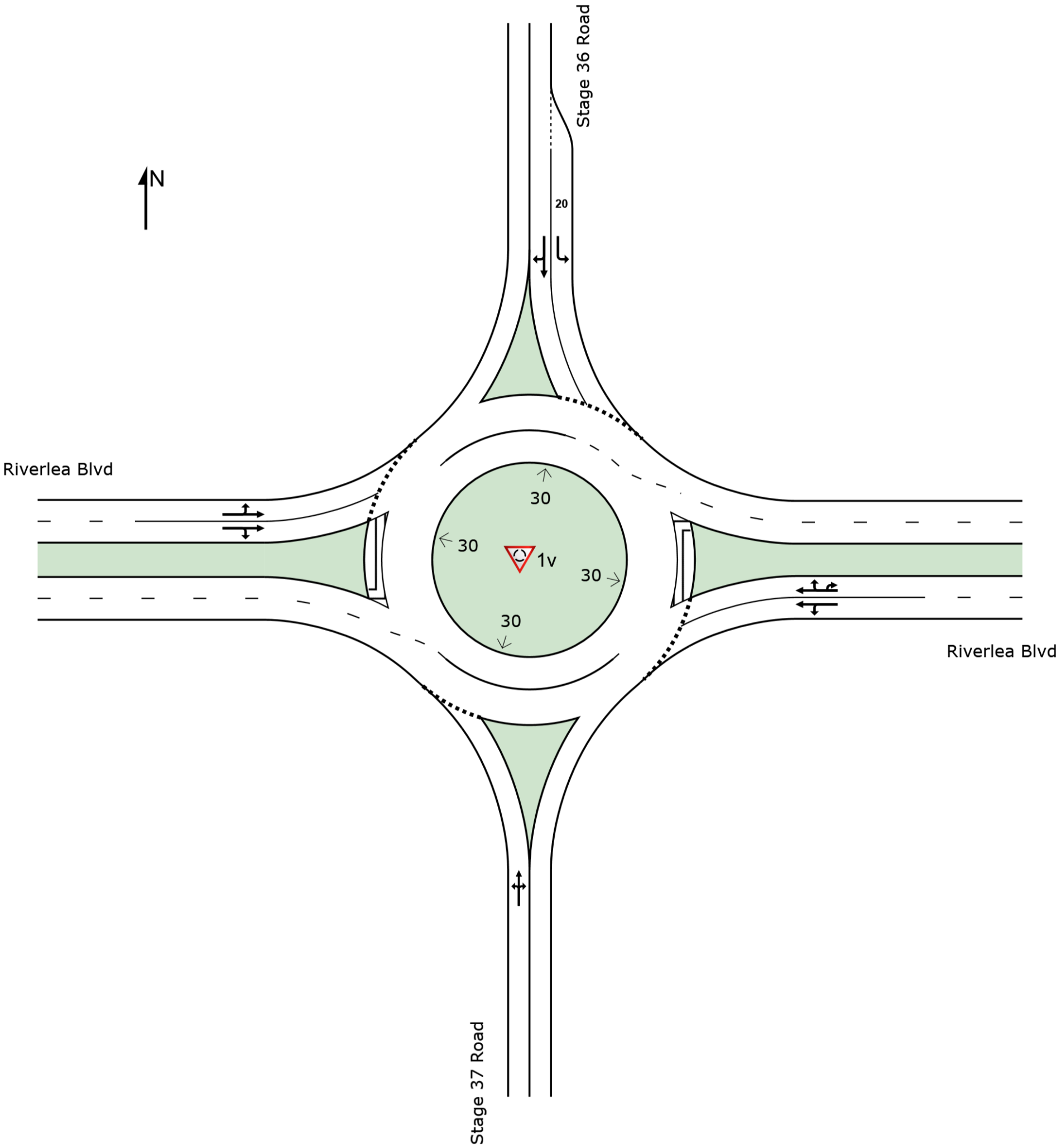
Appendix D Intersection 6 SIDRA Summary

SITE LAYOUT

Site: 1v [Prec2_Int_6-Pre2-AM (Site Folder: Precinct 2 Update)]

Intersection 6
Precinct 2 Volumes
AM Peak
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



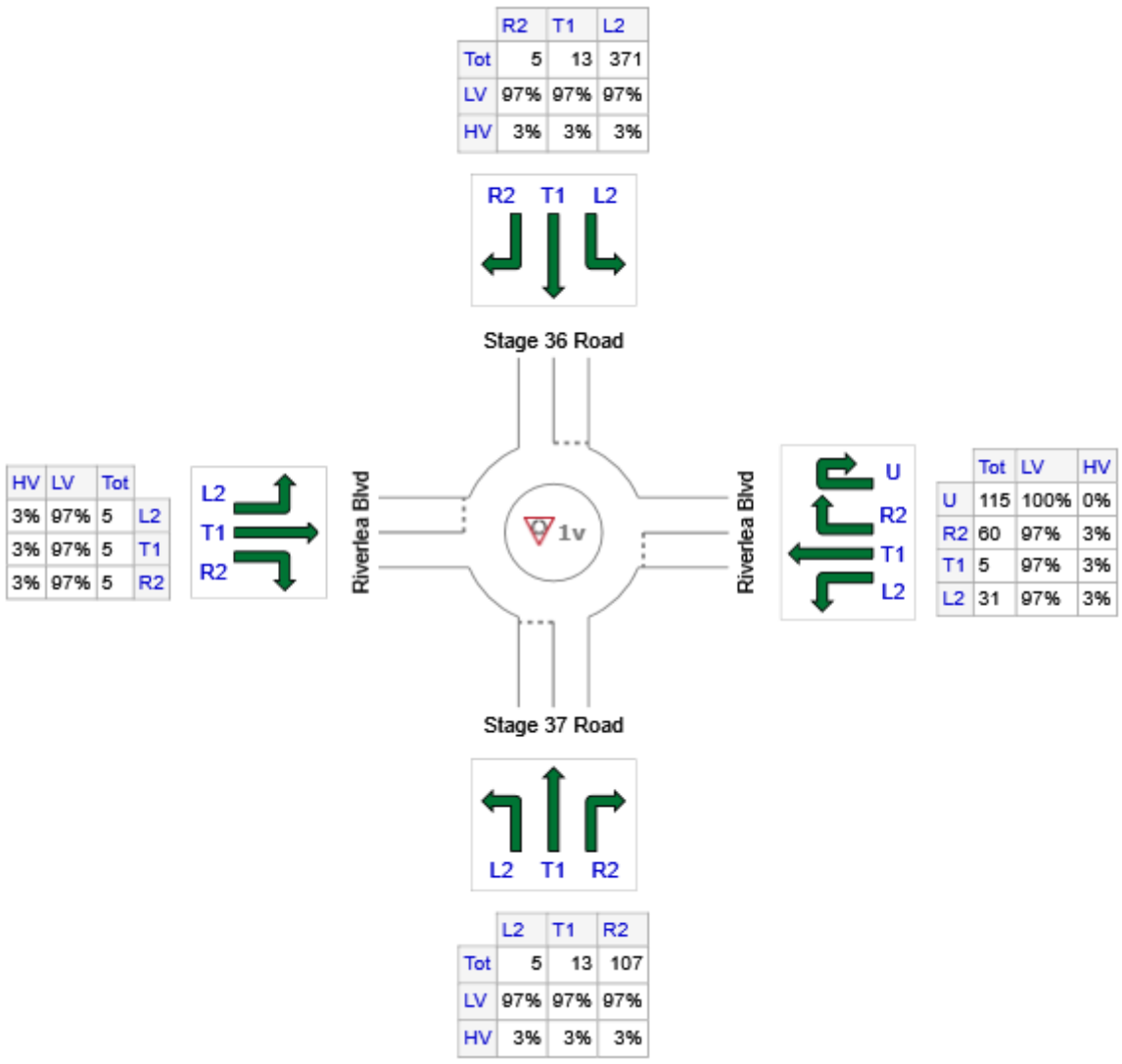
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 1v [Prec2_Int_6-Pre2-AM (Site Folder: Precinct 2 Update)]

Intersection 6
Precinct 2 Volumes
AM Peak
Site Category: (None)
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: Stage 37 Road	125	121	4
E: Riverlea Blvd	211	208	3
N: Stage 36 Road	389	377	12
W: Riverlea Blvd	15	15	0
Total	740	721	19

MOVEMENT SUMMARY

Site: 1v [Prec2_Int_6-Pre2-AM (Site Folder: Precinct 2 Update)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 6
Precinct 2 Volumes
AM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stage 37 Road															
1	L2	All MCs	5	3.0	5	3.0	0.134	4.6	LOS A	0.6	4.6	0.38	0.58	0.38	47.8
2	T1	All MCs	14	3.0	14	3.0	0.134	3.2	LOS A	0.6	4.6	0.38	0.58	0.38	45.0
3	R2	All MCs	113	3.0	113	3.0	0.134	8.7	LOS A	0.6	4.6	0.38	0.58	0.38	47.3
Approach			132	3.0	132	3.0	0.134	8.0	LOS A	0.6	4.6	0.38	0.58	0.38	47.1
East: Riverlea Blvd															
4	L2	All MCs	33	3.0	33	3.0	0.033	3.7	LOS A	0.2	1.3	0.14	0.41	0.14	50.9
5	T1	All MCs	5	3.0	5	3.0	0.033	3.6	LOS A	0.2	1.3	0.14	0.41	0.14	55.4
6	R2	All MCs	63	3.0	63	3.0	0.106	9.2	LOS A	0.7	4.7	0.12	0.63	0.12	46.7
6u	U	All MCs	121	0.0	121	0.0	0.106	11.6	LOS A	0.7	4.7	0.12	0.63	0.12	49.8
Approach			222	1.4	222	1.4	0.106	9.6	LOS A	0.7	4.7	0.13	0.59	0.13	49.1
North: Stage 36 Road															
7	L2	All MCs	391	3.0	391	3.0	0.333	3.8	LOS A	2.0	14.3	0.46	0.46	0.46	50.0
8	T1	All MCs	14	3.0	14	3.0	0.027	4.1	LOS A	0.1	0.9	0.43	0.49	0.43	46.9
9	R2	All MCs	5	3.0	5	3.0	0.027	11.3	LOS A	0.1	0.9	0.43	0.49	0.43	49.5
Approach			409	3.0	409	3.0	0.333	3.9	LOS A	2.0	14.3	0.46	0.46	0.46	49.9
West: Riverlea Blvd															
10	L2	All MCs	5	3.0	5	3.0	0.007	4.7	LOS A	0.0	0.3	0.44	0.43	0.44	53.6
11	T1	All MCs	5	3.0	5	3.0	0.007	4.7	LOS A	0.0	0.3	0.45	0.48	0.45	53.1
12	R2	All MCs	5	3.0	5	3.0	0.007	10.7	LOS A	0.0	0.3	0.47	0.55	0.47	50.5
Approach			16	3.0	16	3.0	0.007	6.7	LOS A	0.0	0.3	0.45	0.49	0.45	52.4
All Vehicles			779	2.5	779	2.5	0.333	6.3	LOS A	2.0	14.3	0.35	0.52	0.35	49.2

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.
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.

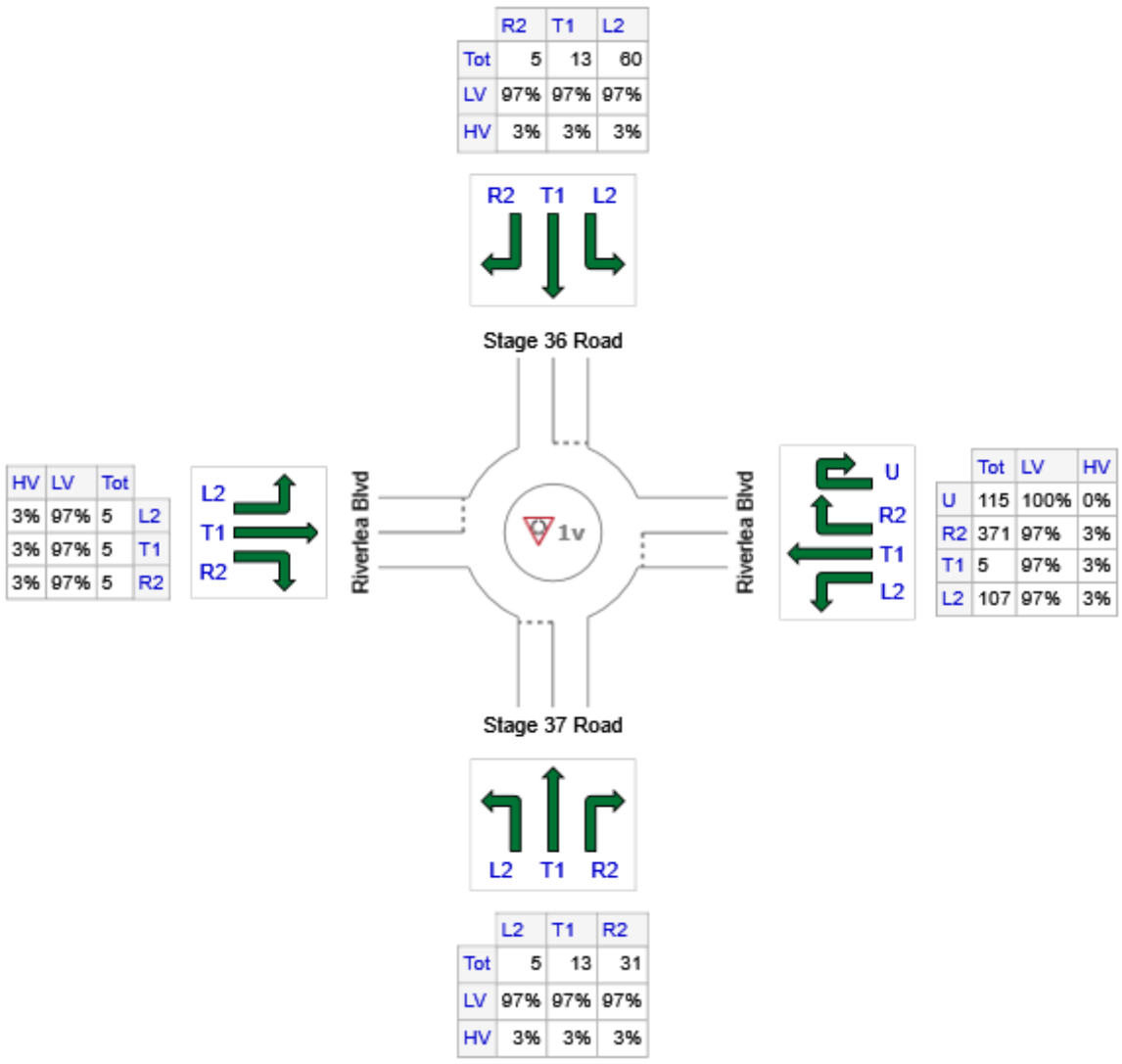
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 1v [Prec2_Int_6-Pre2-PM (Site Folder: Precinct 2 Update)]

Intersection 6
Precinct 2 volumes
PM Peak
Site Category: (None)
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: Stage 37 Road	49	48	1
E: Riverlea Blvd	598	584	14
N: Stage 36 Road	78	76	2
W: Riverlea Blvd	15	15	0
Total	740	721	19

MOVEMENT SUMMARY

Site: 1v [Prec2_Int_6-Pre2-PM (Site Folder: Precinct 2 Update)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 6
Precinct 2 volumes
PM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stage 37 Road															
1	L2	All MCs	5	3.0	5	3.0	0.069	6.6	LOS A	0.3	2.3	0.56	0.66	0.56	47.8
2	T1	All MCs	14	3.0	14	3.0	0.069	5.1	LOS A	0.3	2.3	0.56	0.66	0.56	45.0
3	R2	All MCs	33	3.0	33	3.0	0.069	10.6	LOS A	0.3	2.3	0.56	0.66	0.56	47.3
Approach			52	3.0	52	3.0	0.069	8.8	LOS A	0.3	2.3	0.56	0.66	0.56	46.7
East: Riverlea Blvd															
4	L2	All MCs	113	3.0	113	3.0	0.098	3.7	LOS A	0.6	4.2	0.14	0.42	0.14	50.9
5	T1	All MCs	5	3.0	5	3.0	0.098	3.6	LOS A	0.6	4.2	0.14	0.42	0.14	55.4
6	R2	All MCs	391	3.0	391	3.0	0.291	9.3	LOS A	2.2	15.4	0.14	0.60	0.14	47.1
6u	U	All MCs	121	0.0	121	0.0	0.291	11.6	LOS A	2.2	15.4	0.14	0.60	0.14	50.3
Approach			629	2.4	629	2.4	0.291	8.7	LOS A	2.2	15.4	0.14	0.57	0.14	48.3
North: Stage 36 Road															
7	L2	All MCs	63	3.0	63	3.0	0.053	3.1	LOS A	0.2	1.7	0.30	0.39	0.30	50.5
8	T1	All MCs	14	3.0	14	3.0	0.024	3.2	LOS A	0.1	0.7	0.35	0.43	0.35	47.3
9	R2	All MCs	5	3.0	5	3.0	0.024	10.5	LOS A	0.1	0.7	0.35	0.43	0.35	49.9
Approach			82	3.0	82	3.0	0.053	3.6	LOS A	0.2	1.7	0.31	0.40	0.31	49.9
West: Riverlea Blvd															
10	L2	All MCs	5	3.0	5	3.0	0.008	6.0	LOS A	0.0	0.3	0.60	0.50	0.60	53.0
11	T1	All MCs	5	3.0	5	3.0	0.008	6.1	LOS A	0.0	0.3	0.60	0.53	0.60	52.5
12	R2	All MCs	5	3.0	5	3.0	0.008	12.3	LOS A	0.0	0.3	0.62	0.60	0.62	49.6
Approach			16	3.0	16	3.0	0.008	8.1	LOS A	0.0	0.3	0.61	0.54	0.61	51.7
All Vehicles			779	2.5	779	2.5	0.291	8.1	LOS A	2.2	15.4	0.20	0.56	0.20	48.4

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.
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.

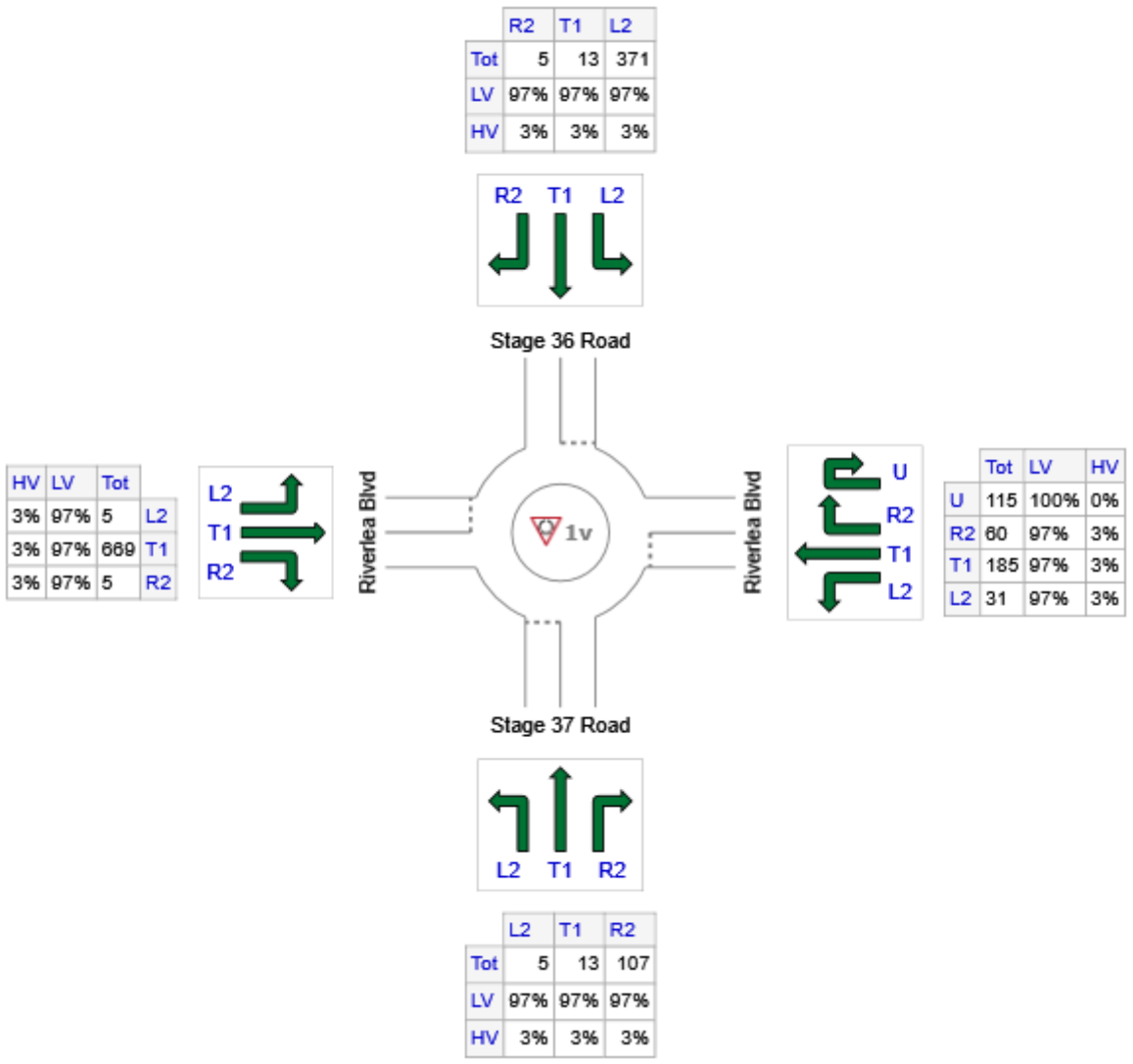
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 1v [Prec2_Int_6-Pre2-Ultimate-AM (Site Folder: Precinct 2 Update)]

Intersection 6
Ultimate volumes
AM Peak
Site Category: (None)
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: Stage 37 Road	125	121	4
E: Riverlea Blvd	391	383	8
N: Stage 36 Road	389	377	12
W: Riverlea Blvd	679	659	20
Total	1584	1540	44

MOVEMENT SUMMARY

Site: 1v [Prec2_Int_6-Pre2-Ultimate-AM (Site Folder: Precinct 2 Update)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 6
Ultimate volumes
AM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stage 37 Road															
1	L2	All MCs	5	3.0	5	3.0	0.157	5.6	LOS A	0.7	5.0	0.49	0.66	0.49	47.5
2	T1	All MCs	14	3.0	14	3.0	0.157	4.2	LOS A	0.7	5.0	0.49	0.66	0.49	44.7
3	R2	All MCs	113	3.0	113	3.0	0.157	9.7	LOS A	0.7	5.0	0.49	0.66	0.49	47.0
Approach			132	3.0	132	3.0	0.157	8.9	LOS A	0.7	5.0	0.49	0.66	0.49	46.7
East: Riverlea Blvd															
4	L2	All MCs	33	3.0	33	3.0	0.128	3.7	LOS A	0.9	6.3	0.13	0.34	0.13	51.0
5	T1	All MCs	195	3.0	195	3.0	0.128	3.5	LOS A	0.9	6.3	0.13	0.35	0.13	55.2
6	R2	All MCs	63	3.0	63	3.0	0.128	9.3	LOS A	0.9	6.0	0.14	0.62	0.14	46.8
6u	U	All MCs	121	0.0	121	0.0	0.128	11.6	LOS A	0.9	6.0	0.14	0.62	0.14	49.9
Approach			412	2.1	412	2.1	0.128	6.8	LOS A	0.9	6.3	0.14	0.47	0.14	51.8
North: Stage 36 Road															
7	L2	All MCs	391	3.0	391	3.0	0.518	7.9	LOS A	3.5	24.8	0.80	0.85	0.97	47.8
8	T1	All MCs	14	3.0	14	3.0	0.046	8.2	LOS A	0.2	1.3	0.68	0.76	0.68	44.9
9	R2	All MCs	5	3.0	5	3.0	0.046	15.4	LOS B	0.2	1.3	0.68	0.76	0.68	47.2
Approach			409	3.0	409	3.0	0.518	8.1	LOS A	3.5	24.8	0.79	0.85	0.96	47.7
West: Riverlea Blvd															
10	L2	All MCs	5	3.0	5	3.0	0.298	5.2	LOS A	2.1	14.9	0.55	0.49	0.55	52.8
11	T1	All MCs	704	3.0	704	3.0	0.298	5.3	LOS A	2.1	14.9	0.56	0.50	0.56	53.2
12	R2	All MCs	5	3.0	5	3.0	0.298	11.3	LOS A	2.0	14.3	0.57	0.51	0.57	52.1
Approach			715	3.0	715	3.0	0.298	5.3	LOS A	2.1	14.9	0.56	0.50	0.56	53.2
All Vehicles			1667	2.8	1667	2.8	0.518	6.7	LOS A	3.5	24.8	0.51	0.59	0.55	50.9

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.
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.

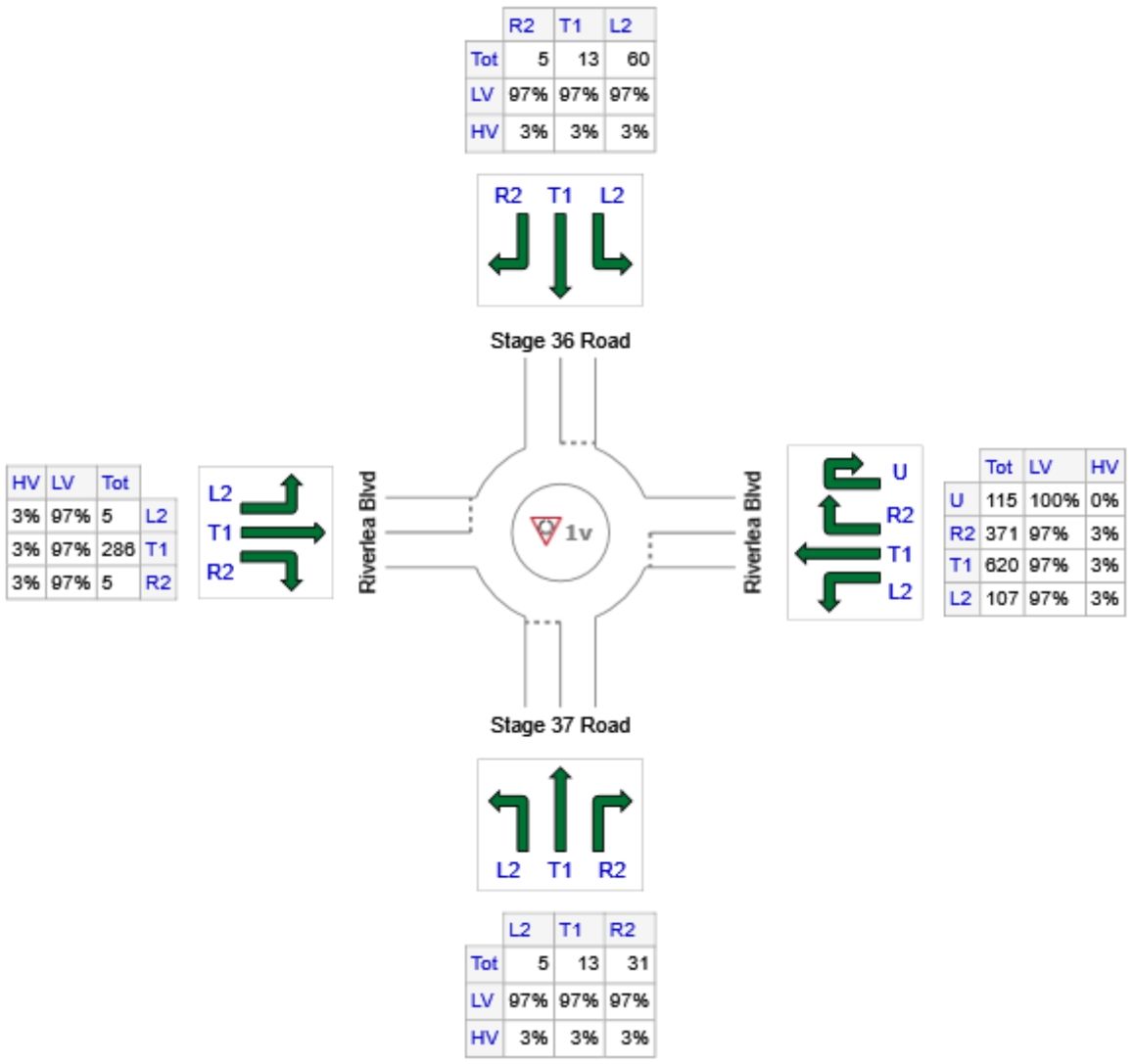
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 1v [Prec2_Int_6-Pre2-Ultimate-PM (Site Folder: Precinct 2 Update)]

Intersection 6
Ultimate volumes
PM Peak
Site Category: (None)
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: Stage 37 Road	49	48	1
E: Riverlea Blvd	1213	1180	33
N: Stage 36 Road	78	76	2
W: Riverlea Blvd	296	287	9
Total	1636	1590	46

MOVEMENT SUMMARY

Site: 1v [Prec2_Int_6-Pre2-Ultimate-PM (Site Folder: Precinct 2 Update)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Intersection 6
Ultimate volumes
PM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stage 37 Road															
1	L2	All MCs	5	3.0	5	3.0	0.094	8.7	LOS A	0.4	2.7	0.66	0.81	0.66	46.6
2	T1	All MCs	14	3.0	14	3.0	0.094	7.2	LOS A	0.4	2.7	0.66	0.81	0.66	43.9
3	R2	All MCs	33	3.0	33	3.0	0.094	12.8	LOS A	0.4	2.7	0.66	0.81	0.66	46.1
Approach			52	3.0	52	3.0	0.094	10.9	LOS A	0.4	2.7	0.66	0.81	0.66	45.6
East: Riverlea Blvd															
4	L2	All MCs	113	3.0	113	3.0	0.392	3.7	LOS A	3.5	24.9	0.17	0.34	0.17	50.8
5	T1	All MCs	653	3.0	653	3.0	0.392	3.6	LOS A	3.5	24.9	0.17	0.37	0.17	54.8
6	R2	All MCs	391	3.0	391	3.0	0.392	9.3	LOS A	3.4	24.5	0.19	0.57	0.19	47.4
6u	U	All MCs	121	0.0	121	0.0	0.392	11.7	LOS A	3.4	24.5	0.19	0.57	0.19	50.7
Approach			1277	2.7	1277	2.7	0.392	6.1	LOS A	3.5	24.9	0.18	0.45	0.18	51.5
North: Stage 36 Road															
7	L2	All MCs	63	3.0	63	3.0	0.066	4.2	LOS A	0.3	2.2	0.51	0.53	0.51	49.9
8	T1	All MCs	14	3.0	14	3.0	0.032	5.2	LOS A	0.1	1.0	0.55	0.59	0.55	46.4
9	R2	All MCs	5	3.0	5	3.0	0.032	12.5	LOS A	0.1	1.0	0.55	0.59	0.55	48.9
Approach			82	3.0	82	3.0	0.066	4.9	LOS A	0.3	2.2	0.52	0.55	0.52	49.2
West: Riverlea Blvd															
10	L2	All MCs	5	3.0	5	3.0	0.159	6.4	LOS A	1.0	7.5	0.65	0.57	0.65	52.4
11	T1	All MCs	301	3.0	301	3.0	0.159	6.6	LOS A	1.0	7.5	0.66	0.58	0.66	52.7
12	R2	All MCs	5	3.0	5	3.0	0.159	12.9	LOS A	1.0	7.0	0.67	0.61	0.67	51.6
Approach			312	3.0	312	3.0	0.159	6.7	LOS A	1.0	7.5	0.66	0.58	0.66	52.7
All Vehicles			1722	2.8	1722	2.8	0.392	6.3	LOS A	3.5	24.9	0.29	0.49	0.29	51.4

Site Level of Service (LOS) Method: Delay (RTA NSW). 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.
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.

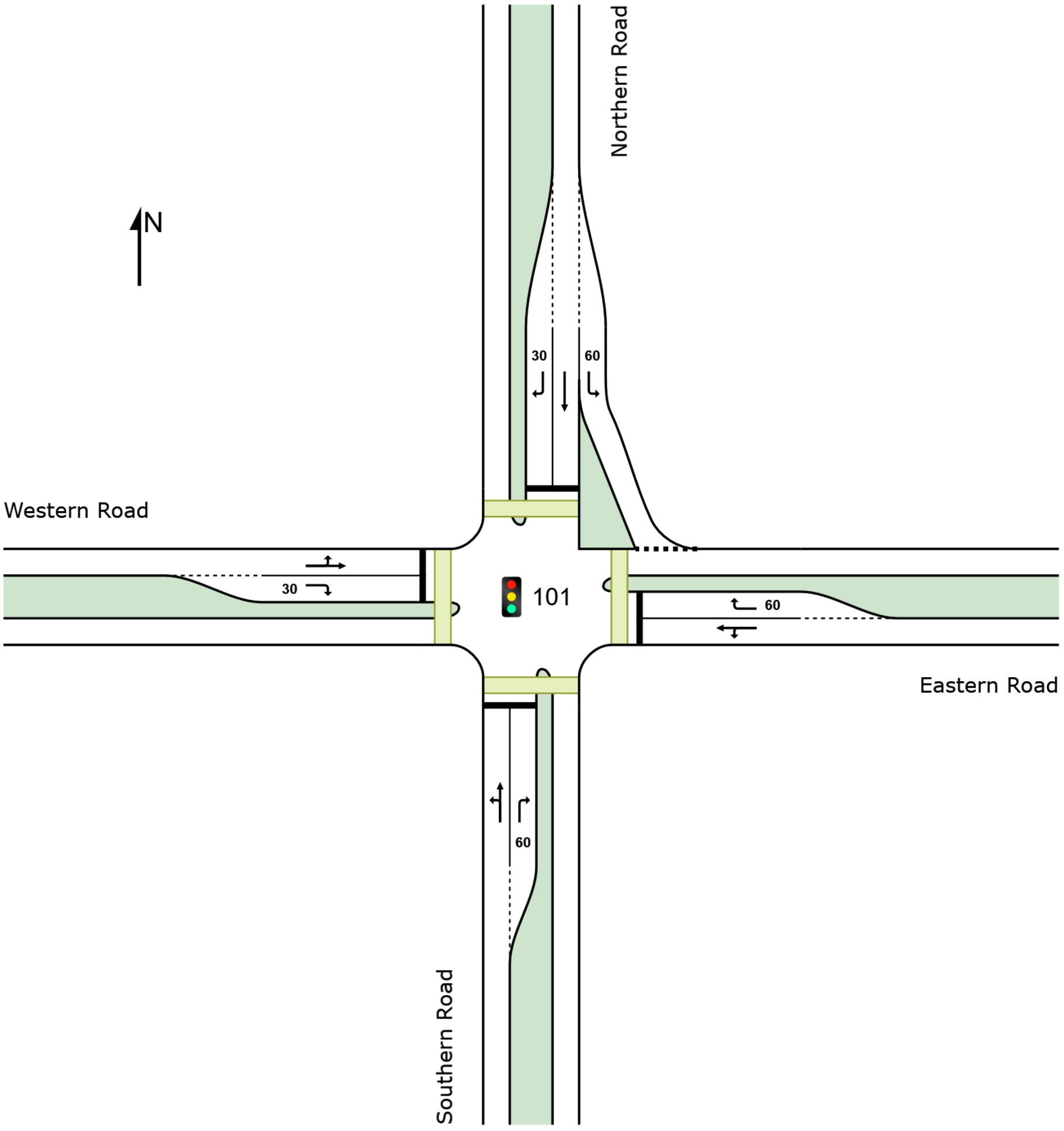
Appendix E Internal Intersection SIDRA Summary

SITE LAYOUT

Site: 101 [Internal Intersection - AM Peak (Site Folder: General)]

Internal Signals
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



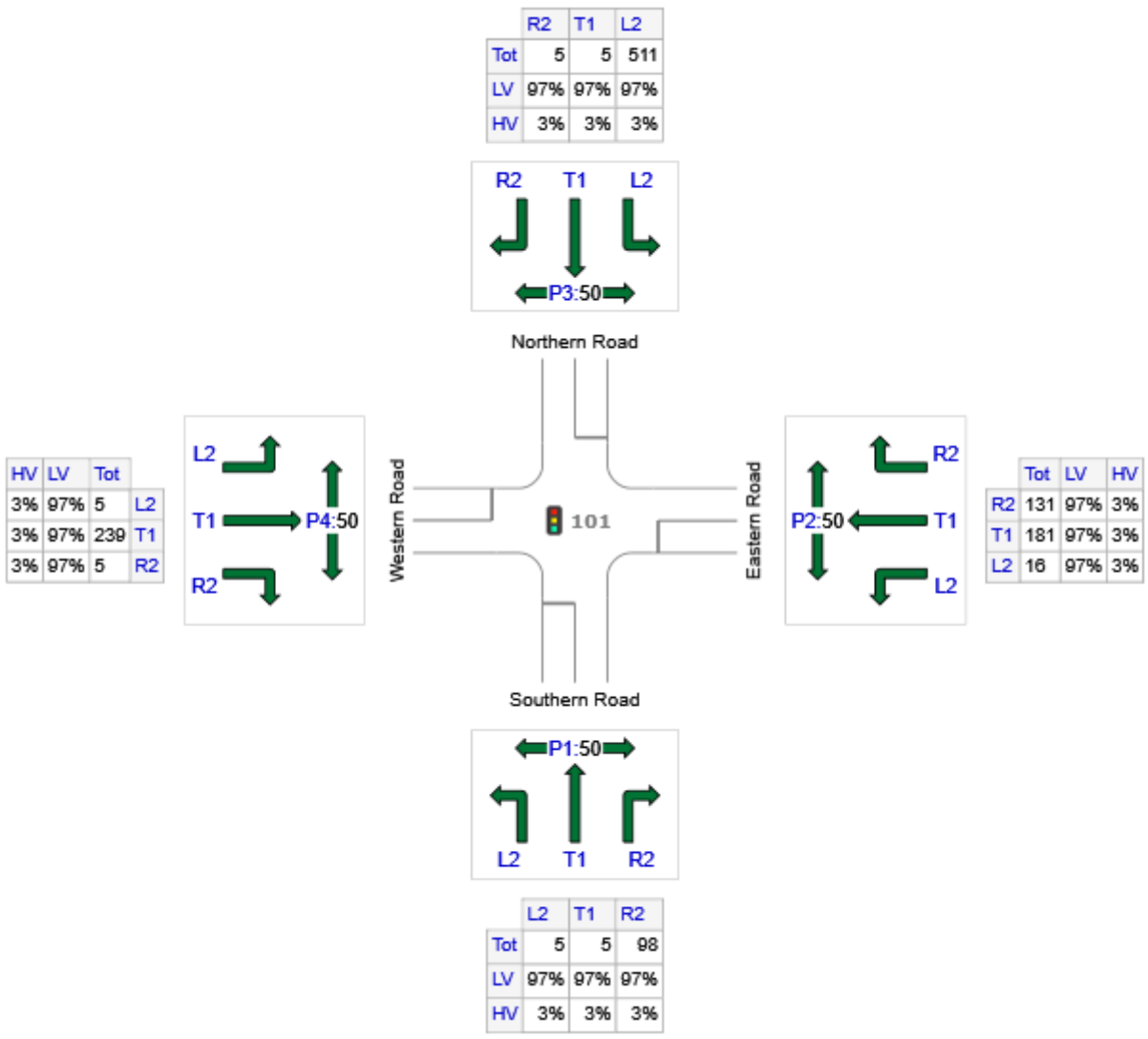
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 101 [Internal Intersection - AM Peak (Site Folder: General)]

Internal Signals
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: Southern Road	108	105	3
E: Eastern Road	328	318	10
N: Northern Road	521	505	16
W: Western Road	249	242	7
Total	1206	1170	36

PHASING SUMMARY

Site: 101 [Internal Intersection - AM Peak (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Internal Signals
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

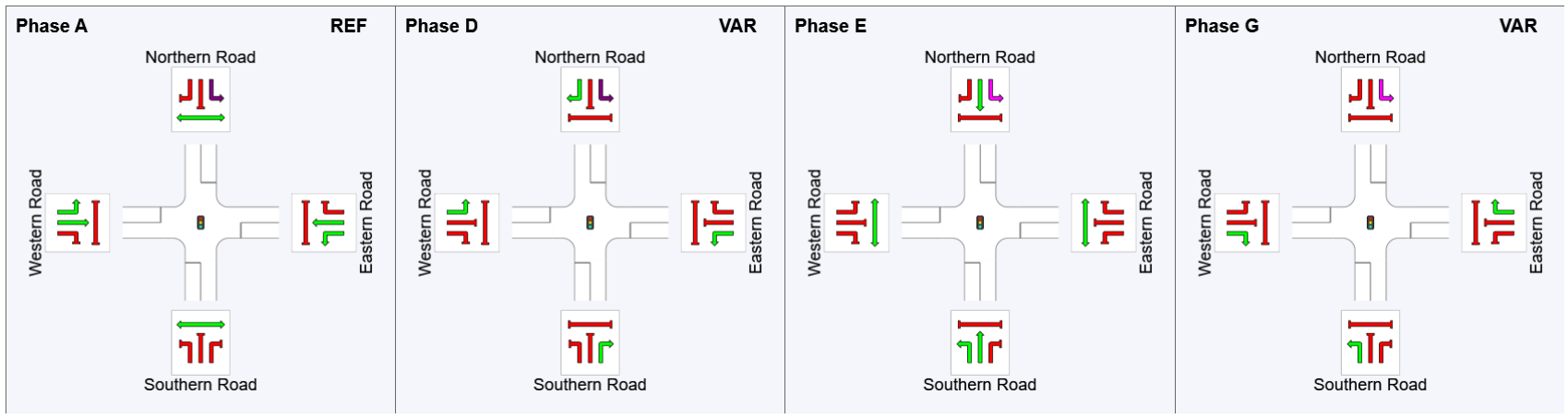
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: DDO
Input Phase Sequence: A, D*, D1*, D2*, E, G*, G1*, G2*
Output Phase Sequence: A, D*, E, G*
Reference Phase: Phase A
(* Variable Phase)

Phase Timing Summary

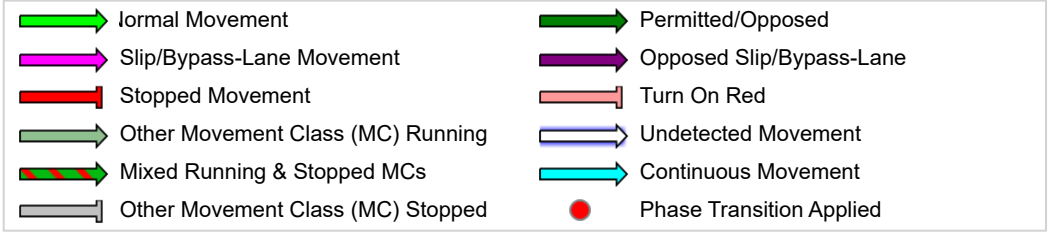
Phase	A	D	E	G
Phase Change Time (sec)	0	25	40	62
Green Time (sec)	17	7	14	10
Phase Time (sec)	25	15	22	18
Phase Split	31%	19%	28%	23%
Phase Frequency (%)	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



MOVEMENT SUMMARY

Site: 101 [Internal Intersection - AM Peak (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Internal Signals
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Southern Road															
1	L2	All MCs	5	3.0	5	3.0	0.028	24.9	LOS C	0.3	2.4	0.83	0.62	0.83	38.7
2	T1	All MCs	5	3.0	5	3.0	* 0.028	36.5	LOS D	0.3	2.4	0.83	0.62	0.83	39.9
3	R2	All MCs	103	3.0	103	3.0	* 0.648	47.2	LOS D	4.3	30.7	1.00	0.83	1.11	33.0
Approach			114	3.0	114	3.0	0.648	45.7	LOS D	4.3	30.7	0.98	0.81	1.09	33.5
East: Eastern Road															
4	L2	All MCs	17	3.0	17	3.0	0.507	23.6	LOS C	7.3	52.5	0.92	0.77	0.92	38.8
5	T1	All MCs	191	3.0	191	3.0	0.507	31.1	LOS C	7.3	52.5	0.92	0.77	0.92	40.0
6	R2	All MCs	138	3.0	138	3.0	* 0.607	43.6	LOS D	5.4	39.1	0.99	0.81	1.03	34.2
Approach			345	3.0	345	3.0	0.607	35.7	LOS D	7.3	52.5	0.95	0.79	0.97	37.4
North: Northern Road															
7	L2	All MCs	538	3.0	538	3.0	0.491	11.3	LOS B	9.0	64.9	0.59	0.74	0.59	49.0
8	T1	All MCs	5	3.0	5	3.0	0.016	29.5	LOS C	0.2	1.2	0.85	0.56	0.85	40.4
9	R2	All MCs	5	3.0	5	3.0	0.033	42.9	LOS D	0.2	1.4	0.94	0.65	0.94	34.3
Approach			548	3.0	548	3.0	0.491	11.8	LOS B	9.0	64.9	0.60	0.74	0.60	48.7
West: Western Road															
10	L2	All MCs	5	3.0	5	3.0	0.634	29.3	LOS C	9.4	67.6	0.96	0.81	0.97	38.5
11	T1	All MCs	252	3.0	252	3.0	* 0.634	36.9	LOS D	9.4	67.6	0.96	0.81	0.97	39.7
12	R2	All MCs	5	3.0	5	3.0	0.023	44.8	LOS D	0.2	1.3	0.90	0.65	0.90	35.5
Approach			262	3.0	262	3.0	0.634	36.9	LOS D	9.4	67.6	0.96	0.80	0.96	37.4
All Vehicles			1269	3.0	1269	3.0	0.648	26.5	LOS C	9.4	67.6	0.80	0.77	0.82	41.1

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)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Southern Road												
P1	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
East: Eastern Road												
P2	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
North: Northern Road												
P3	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
West: Western Road												
P4	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
All Pedestrians		200	211	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

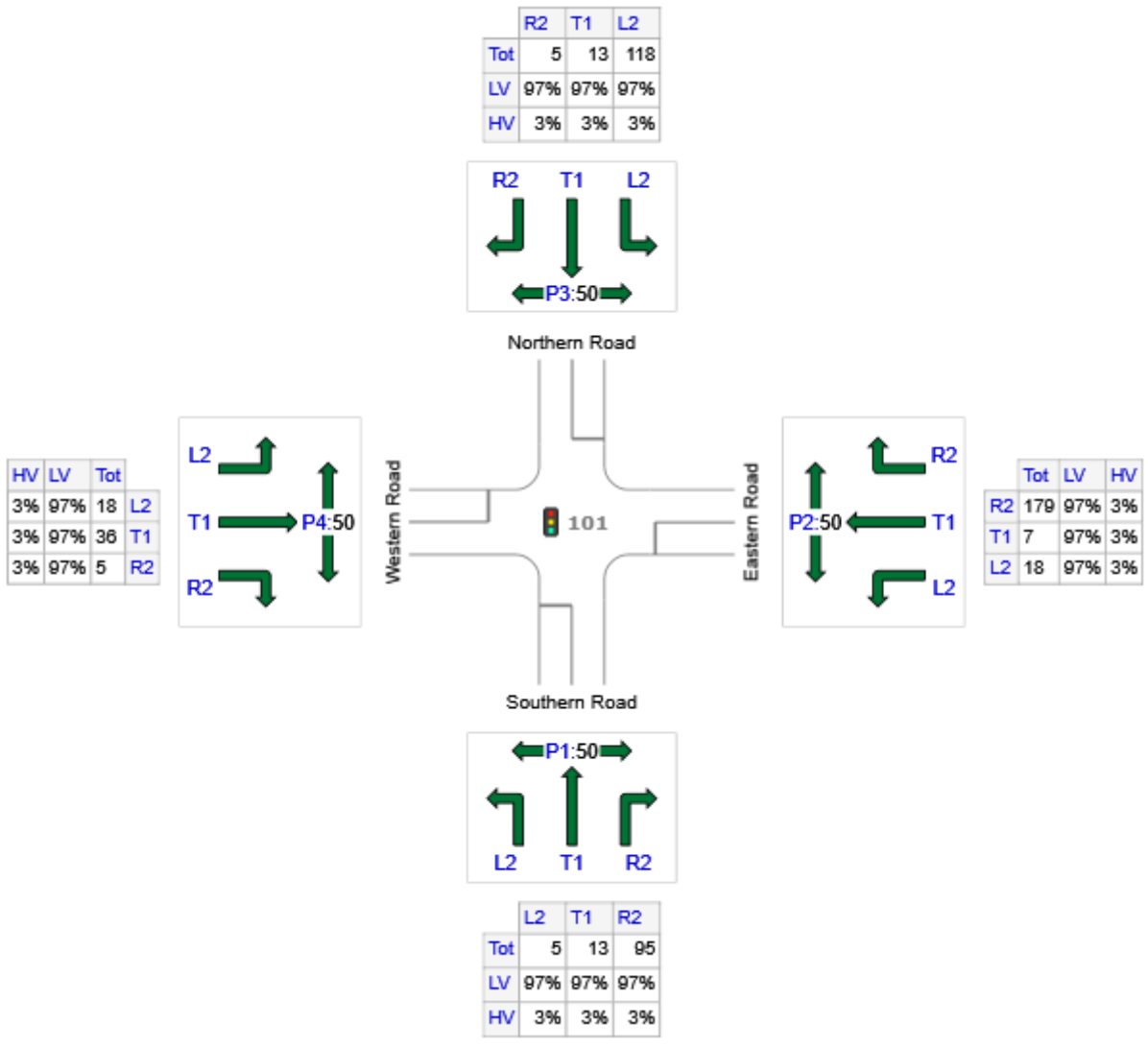
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 101 [Internal Intersection - PM Peak (Site Folder: General)]

Internal Signals
PM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: Southern Road	113	110	3
E: Eastern Road	204	198	6
N: Northern Road	136	132	4
W: Western Road	59	57	2
Total	512	497	15

PHASING SUMMARY

Site: 101 [Internal Intersection - PM Peak (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Internal Signals
PM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: SDO
Input Phase Sequence: A, D1, D2, G, G1*, G2*
Output Phase Sequence: A, D1, D2, G, G2*
Reference Phase: Phase A
(* Variable Phase)

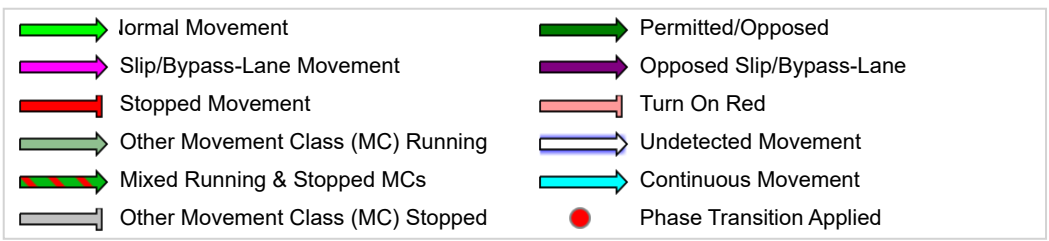
Phase Timing Summary

Phase	A	D1	D2	G	G2
Phase Change Time (sec)	0	20	40	60	74
Green Time (sec)	12	12	12	6	***
Phase Time (sec)	20	20	20	14	6
Phase Split	25%	25%	25%	18%	8%
Phase Frequency (%)	100.0	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence

REF: Reference Phase
VAR: Variable Phase



MOVEMENT SUMMARY

Site: 101 [Internal Intersection - PM Peak (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Internal Signals
PM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Southern Road															
1	L2	All MCs	5	3.0	5	3.0	0.063	23.6	LOS C	0.6	4.6	0.87	0.64	0.87	37.9
2	T1	All MCs	14	3.0	14	3.0	0.063	36.2	LOS D	0.6	4.6	0.87	0.64	0.87	39.1
3	R2	All MCs	100	3.0	100	3.0	*0.367	39.9	LOS D	3.7	26.4	0.94	0.77	0.94	35.3
Approach			119	3.0	119	3.0	0.367	38.7	LOS D	3.7	26.4	0.93	0.75	0.93	35.8
East: Eastern Road															
4	L2	All MCs	19	3.0	19	3.0	0.051	13.0	LOS B	0.4	2.9	0.75	0.65	0.75	46.1
5	T1	All MCs	7	3.0	7	3.0	0.051	22.5	LOS C	0.4	2.9	0.75	0.65	0.75	47.8
6	R2	All MCs	188	3.0	188	3.0	*0.691	43.1	LOS D	7.5	54.0	1.00	0.86	1.09	34.3
Approach			215	3.0	215	3.0	0.691	39.8	LOS D	7.5	54.0	0.97	0.83	1.05	35.5
North: Northern Road															
7	L2	All MCs	124	3.0	124	3.0	0.096	7.3	LOS A	0.8	6.0	0.30	0.63	0.30	51.8
8	T1	All MCs	14	3.0	14	3.0	*0.048	31.9	LOS C	0.5	3.4	0.88	0.61	0.88	39.4
9	R2	All MCs	5	3.0	5	3.0	0.019	37.2	LOS D	0.2	1.3	0.87	0.65	0.87	36.3
Approach			143	3.0	143	3.0	0.096	10.8	LOS B	0.8	6.0	0.37	0.63	0.37	49.5
West: Western Road															
10	L2	All MCs	19	3.0	19	3.0	0.187	24.8	LOS C	2.0	14.2	0.90	0.70	0.90	37.5
11	T1	All MCs	38	3.0	38	3.0	*0.187	38.5	LOS D	2.0	14.2	0.90	0.70	0.90	38.6
12	R2	All MCs	5	3.0	5	3.0	0.039	44.3	LOS D	0.2	1.4	0.95	0.64	0.95	33.9
Approach			62	3.0	62	3.0	0.187	34.8	LOS C	2.0	14.2	0.90	0.70	0.90	37.8
All Vehicles			539	3.0	539	3.0	0.691	31.3	LOS C	7.5	54.0	0.79	0.74	0.83	38.8

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.
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.
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