Wilga Street Block, Corrimal

Traffic Impact Assessment

Wollongong Council

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1. INTRODUCTION

1.1 Background

Wollongong City Council (Council) is undertaking a review of planning controls for a key site in Corrimal town centre referred to as the 'Wilga Street Block'. The Wilga Street Block (the Block) was identified for potential redevelopment in the Corrimal Town Centre Plan (2015), and Council has proposed a revised set of planning controls that would permit additional housing, shops and recreational space.

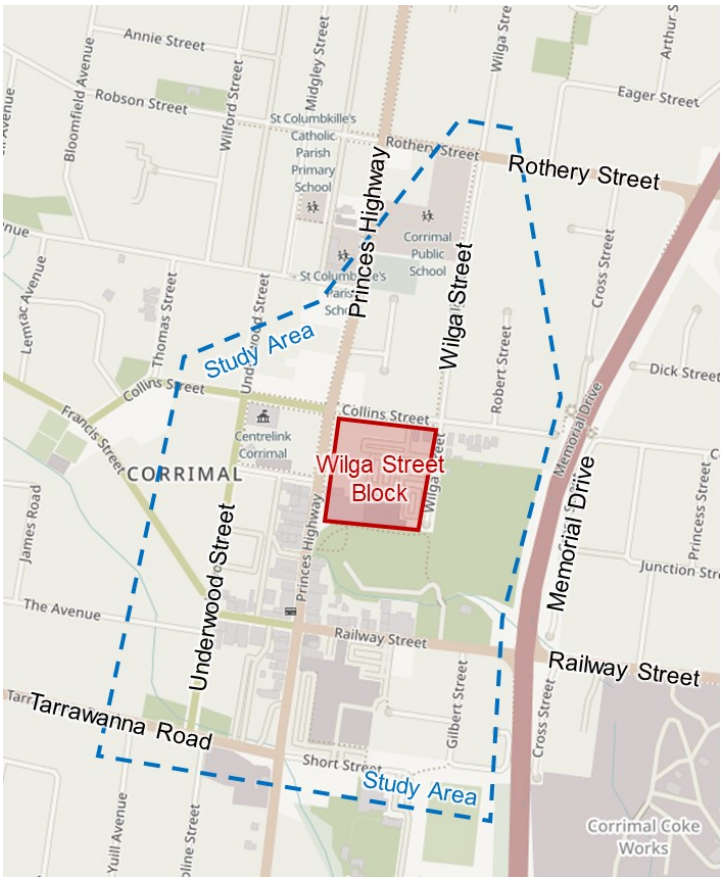
Council has engaged Bitzios Consulting to undertake a Traffic Impact Assessment of the proposed revisions to the planning controls, and to develop a microsimulation traffic model in Aimsun and:

- Use the model to assess traffic impacts and to inform road and intersection upgrade requirements
- Assess active transport and public transport facilities and potential improvements.

1.2 Study Area

The study area is shown in Figure 1.1 and bounded by:

- The Wilga Street / Rothery Street intersection to the north
- Underwood Street to the west
- Memorial Drive to the east
- Tarrawanna Road and Short Street to the south.



Basemap: OpenStreetMap

Figure 1.1: Study Area

1.3 Study Process

The study was undertaken in three (3) stages with the purpose of each stage being:

- **Stage 1 – Existing Traffic and Transport Assessment:** Involving the collection of travel pattern, traffic volume, travel time, public transport and active transport data. In Stage 1 an Aimsun traffic microsimulation model was also created, calibrated and validated to simulate the existing traffic conditions.
- **Stage 2 – Future Traffic Assessment:** Use the base Aimsun model to assess the future traffic performance 'With' and 'Without' the proposed uplift of the Wilga Street Block to identify pinch points and devise and test improvement measures.
- **Stage 3 – Reporting:** Summarise the study process and outcomes to document the assessment and provide information to assist Council in its preparation of stakeholder engagement materials.

1.4 Report Outline

The remainder of this report is structured as follows:

- **Section 2 – Wilga Street Block Proposal:** Outlines Council's proposal for the revised planning controls
- **Section 3 – Existing Traffic and Transport Conditions:** Details the current performance of the traffic network in terms of general traffic, pedestrians, cyclists and public transport
- **Section 4 – 2036 Do Minimum Assessment:** Details the assessment of the traffic network in 2036 with background traffic growth only
- **Section 5 – Wilga Street Block Uplift Assessment:** Details the assessment of the traffic network in 2036 with the revised planning controls
- **Section 6 – Mitigation Measures:** Advises on the suitability of potential network upgrades for mitigating the impacts of the uplift
- **Section 7 – Active and Public Transport:** Advises on options for improving active and public transport access and amenity
- **Section 8 – Summary:** Summarises the key findings of this study

2. WILGA STREET BLOCK PROPOSAL

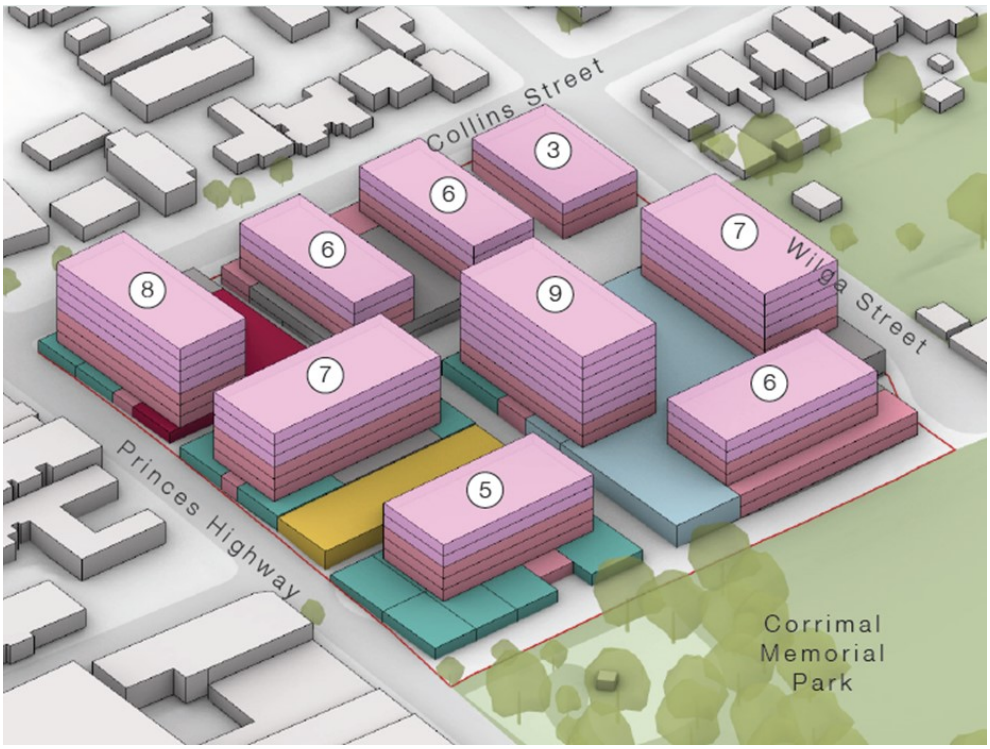
2.1 Revised Planning Controls

Council is seeking to transform the Wilga Street Block into a *'vibrant and flexible mixed use precinct that strengthens the role and identity of Corrimal Town Centre'*. The Block currently has split zoning, with the western half zoned as part of the Local Centre (B2), and the eastern half zoned as Low Density Residential (R2).

Two levels of density for the structure plan were proposed by Council:

- **Scenario A:** Theoretical base scenario of 1.5:1 floor space ratio (FSR) for all properties
- **Scenario B:** Increased FSR of 2:1 on selected properties

A concept layout is shown in Figure 2.1



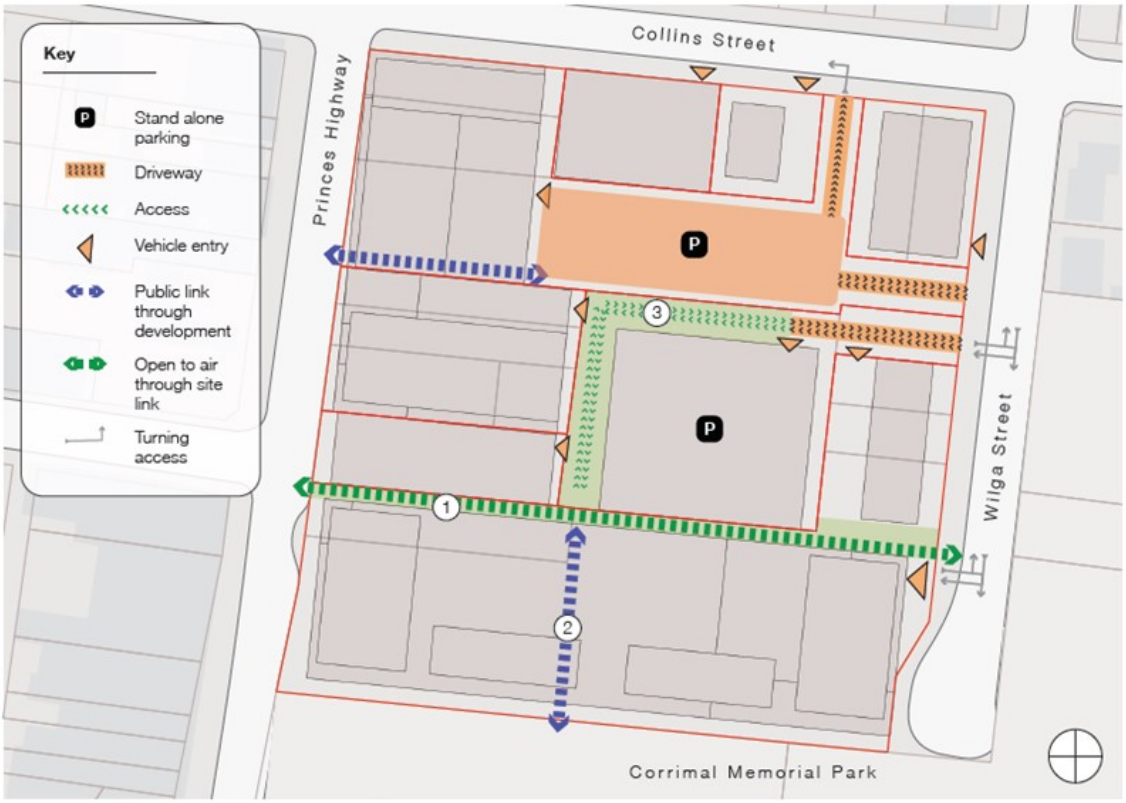
Source: SJB Architects Draft Concept

Figure 2.1: Concept Future Layout

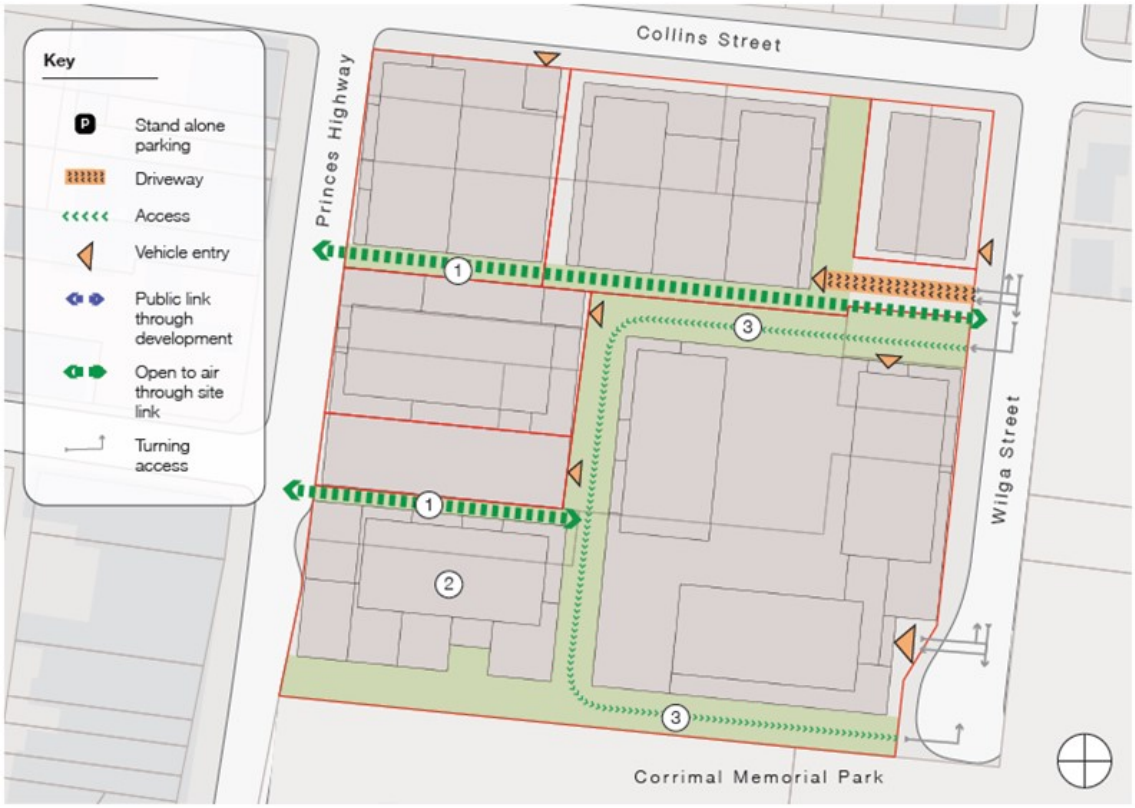
2.2 Site Access

Vehicle access is currently provided off Princes Highway, Collins Street and Wilga Street. However, as part of the Urban Design Study there is likely to be a consolidation of accesses on Collins Street and Wilga Street with no access from the Princes Highway as shown in Figure 2.2.

Layout plan 1



Layout plan 2



Source: SJB Architects Draft Concept

Figure 2.2: Concept Site Access Options

3. EXISTING TRAFFIC AND TRANSPORT CONDITIONS

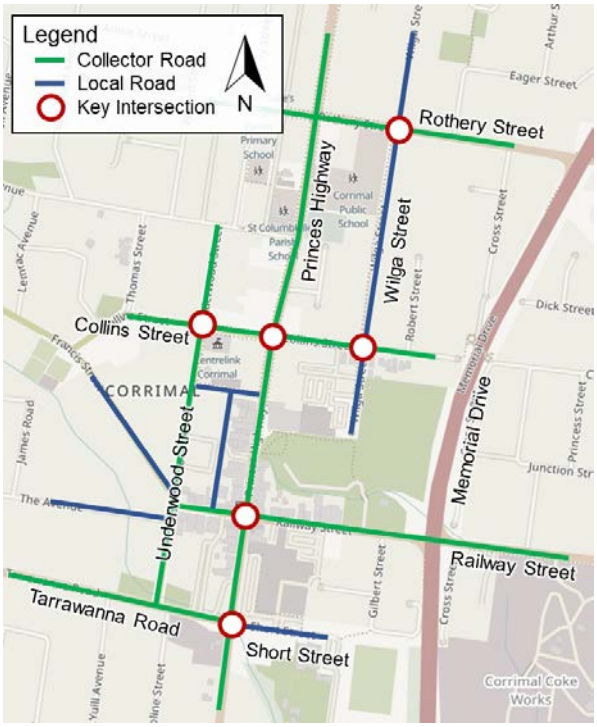
3.1 Road Network

3.1.1 Road Hierarchy

The road network within the study area comprises a mix of collector roads, local streets and laneways. Collector roads including Princes Highway and Railway Parade are used by visitors to Corrimal CBD as well as passing traffic. The key roads within the study area and their classification are summarised in Table 3.1.

Table 3.1: Road Network Summary

Road Name	Jurisdiction	Hierarchy	Cross Section	Speed Limit
Princes Highway	Council	Sub-Arterial	2-lane undivided	50 km/h
Collins Street	Council	Collector	2-lane undivided	50 km/h
Wilga Street	Council	Local	2-lane undivided	50 km/h
Rothery Street	Council	Collector	2-lane undivided	50 km/h
Railway Street	Council	Collector	2-lane undivided	50 km/h
Tarrawanna Road	Council	Collector	2-lane undivided	50 km/h
Underwood Street	Council	Collector	2-lane undivided	50 km/h
Russell Street	Council	Local	2-lane undivided	50 km/h
Bertram Lane	Council	Local	2-lane undivided	50 km/h
Francis Street	Council	Local	2-lane undivided	50 km/h
The Avenue	Council	Local	2-lane undivided	50 km/h
Short Street	Council	Local	2-lane undivided	50 km/h



Basemap: OpenStreetMap

Figure 3.1: Road Hierarchy and Key Intersections

3.1.2 Key Intersections

Six intersections were identified within the study area as 'key intersections' that are likely to be impacted by the proposed development, as described in Table 3.2:

- Collins Street / Wilga Street
- Princes Highway / Collins Street
- Princes Highway / Railway Street
- Princes Highway / Tarrawanna Road / Short Street
- Collins Street / Underwood Road
- Rothery Street / Wilga Street.

Table 3.2: Key Intersection Descriptions

Intersection	Description	Intersection Layout
Collins Street / Wilga Street	▪ Four-way priority-controlled intersection with one lane on each approach ▪ Stop control from north and south approach.	
Princes Highway / Collins Street	▪ Four-way signalised intersection with one through lane and one right turn pocket on all approaches	
Princes Highway / Railway Street	▪ Four-way signalised intersection with two approach lanes from all directions ▪ Right turns restricted from north and west.	

Intersection	Description	Intersection Layout
Princes Highway / Tarrawanna Road / Short Street	▪ Four-way signalised intersection with two approach lanes from all directions	
Underwood Street	▪ Four-way priority-controlled intersection with one lane on each approach ▪ Stop control from north and south approach.	
Wilga Street / Rothery Street	▪ Four-way priority-controlled intersection with one lane on each approach ▪ Stop control from north and south approach.	

3.2 Public Transport

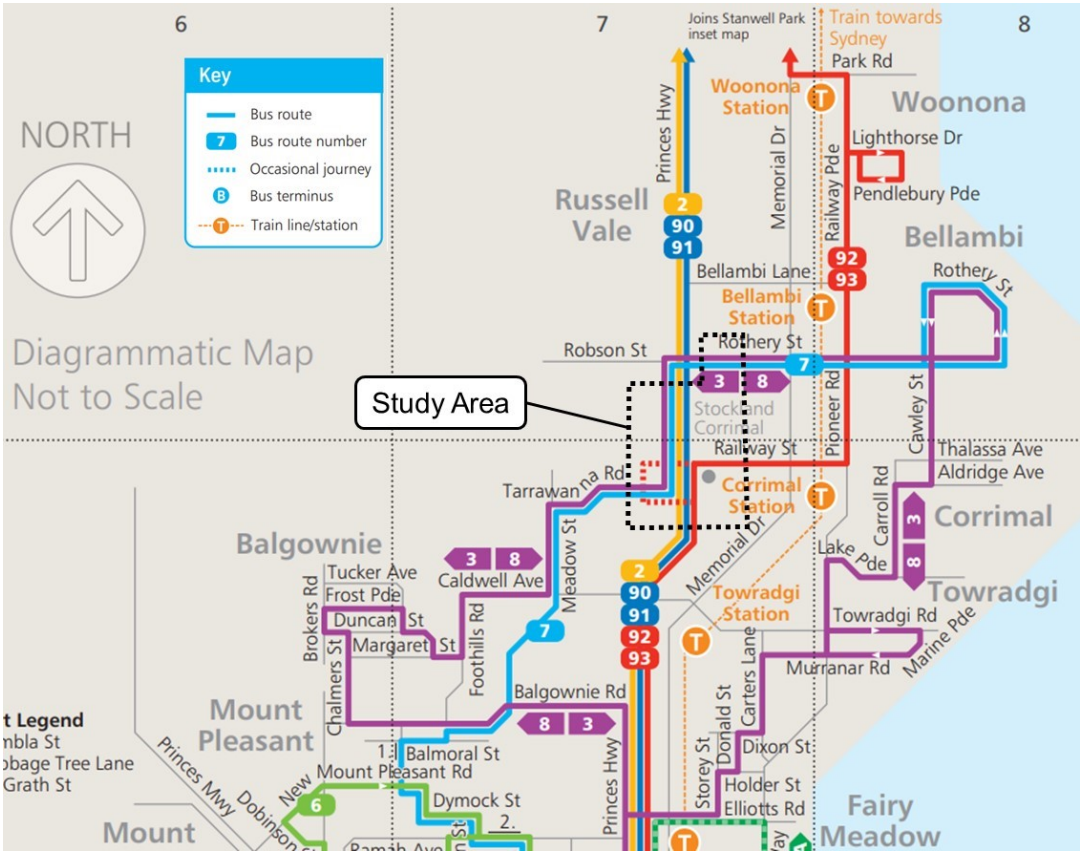
3.2.1 Bus Services

Corrimal is serviced by the Illawarra bus network, which is operated by Premier. There are currently eight bus routes servicing the study area which are all local routes that link residential areas in Corrimal to Wollongong CBD and the surrounding suburbs north of Wollongong.

Services operate at a moderate frequency during the AM and PM peak periods, and at a reduced frequency during weekends. Bus timetables for all routes operating within the study area are summarised in in Table 3.3 and the bus operator map is shown in Figure 3.2.

Table 3.3: Bus Routes and Frequencies

Route	Description	2-Hour Frequency	
		AM	PM
2	Stanwell Park to Wollongong via Thirroul	3	5
3	Wollongong to Bellambi via Towradgi (Loop)	4	2
7	Wollongong to Bellambi (Loop)	2	2
8	Wollongong to Bellambi via Balgownie (Loop)	3	3
90	Austinmer Station to Wollongong	6	6
91	Austinmer Station to University of Wollongong	1	1
92	Bulli to Wollongong	2	1
93	Bulli to University of Wollongong	1	2



Source: transportnsw.info

Figure 3.2: Local Bus Operator Map

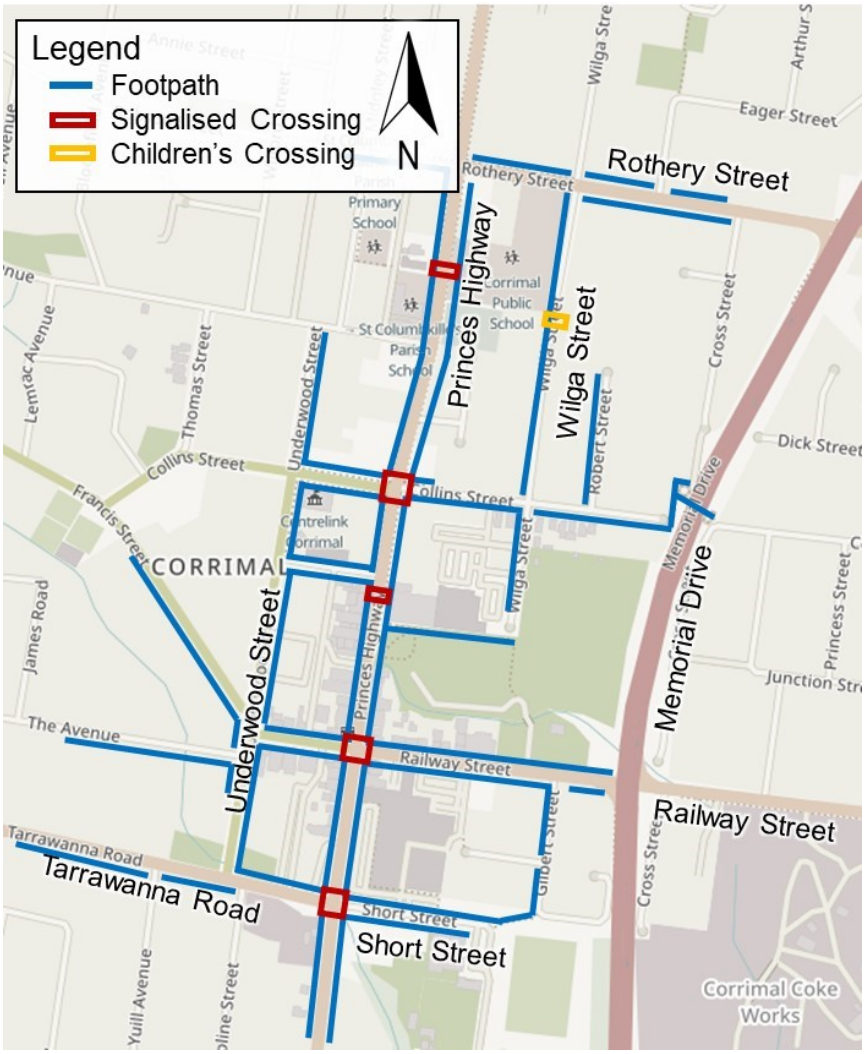
3.2.2 Rail Services

Corrimal Station is the closest railway station to the Wilga Street Block and is located approximately 950m east of the Block along Railway Street. Corrimal is a local station on the South Coast Line between Wollongong and Waterfall. Services operate at 30-minute intervals during the AM and PM peak periods, and at a reduced frequency during weekends.

3.3 Active Transport

3.3.1 Walking

Corrimal town centre is well connected by footpaths, with continuous paths along both sides of Princes Highway and pedestrian crossings on all sides of all traffic signals. Local roads outside the town centre tend to have footpaths on only one side of the road or none. The existing footpath network is shown in Figure 3.3.



Basemap: OpenStreetMap

Figure 3.3: Local Footpath Network

3.3.2 Cycling

No formal cycling infrastructure is currently provided within the study area, but Council has proposed cycle routes in the future within the study area.

3.4 2022 Traffic Volumes and Patterns

3.4.1 Traffic Survey Overview

The traffic data collected for this assessment is summarised below:

- **Intersection counts:** At 12 intersections within the study area and used to develop the Aimsun matrix and calibrate the Aimsun model. Of the 12 intersections, five were surveyed in 2022, while the remaining seven intersections used the 2018 data
- **Council Intersection Counts:** At the Wilga Street / Rothery Street intersection, surveyed on the same date as the other 2022 intersection counts and used to develop the SIDRA model
- **Travel time data:** Along one route resurveyed in 2022 and used to validate the Aimsun model
- **Signal data:** For three intersections within the study area using 2018 SCATS data.

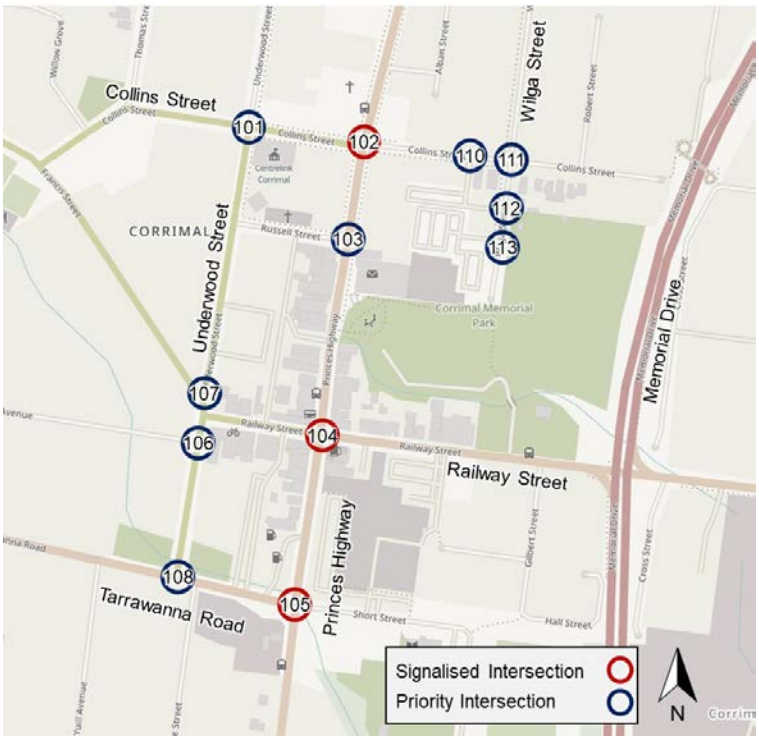
3.4.2 Intersection Counts

Intersection count surveys were undertaken by Matrix Traffic and Transport Data (Matrix) on Wednesday 19 October 2022 at five intersections adjacent to the Block (102,110-113). The counts were classified into light vehicles, heavy vehicles and cyclists, and recorded in 15-minute intervals.

The 2018 traffic survey included eight intersections within the modelled area (101-108), including an overlap with the new survey at the Princes Highway / Collins Street intersection (102). The 2018 traffic data along Princes Highway were 'balanced' to match the 2022 counts at the Collins Street intersection for the purposes of model calibration.

Traffic survey counts at the Wilga Street / Rothery Street intersection were also provided by Council for the 2022 survey date.

The surveyed intersection locations are shown in Figure 3.4 and the traffic count diagrams are provided in **Appendix A**.

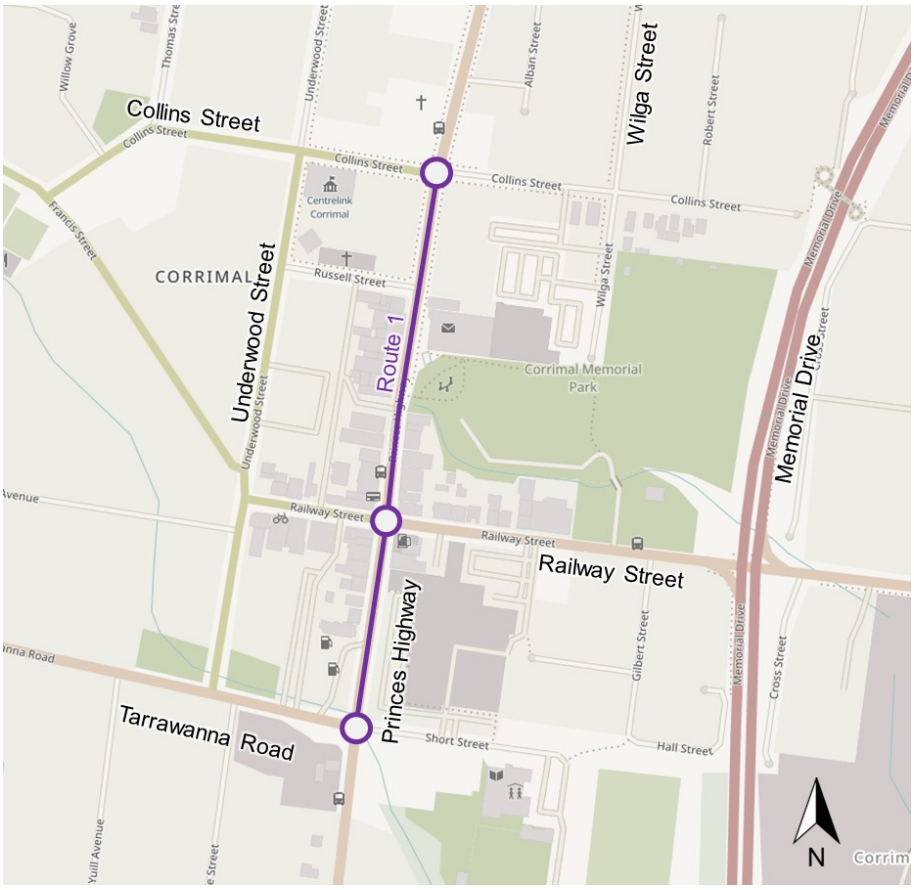


Basemap: OpenStreetMap

Figure 3.4: Intersection Count Locations

3.4.3 Travel Time Data

Travel time surveys were undertaken by Matrix on the same day as the intersection counts along one route along Princes Highway between Tarrawanna Road and Collins Street and shown in Figure 3.5.



Basemap: OpenStreetMap

Figure 3.5: Travel Time Routes

3.4.4 Signal Data

TfNSW provided SCATS Intersection Diagnostic Monitor (IDM) data for three signalised intersections within the study area for Wednesday 30 May 2018 in 15-minute intervals:

- TCS 1653 – Princes Highway / Collins Street
- TCS 427 – Princes Highway / Railway Street
- TCS 338 – Princes Highway / Tarrawanna Road / Short Street

The '.LX' file for the region was also provided.

Signal phasing sequences for the three signalised intersections are summarised below:

- The Princes Highway / Collins Street signals have four phases. Phases A, B and D service traffic from Princes Highway with leading and trailing right turns, and Phase C services traffic from Collins Street
- The Princes Highway / Railway Street signals have three phases. Phases A and B service traffic from Princes Highway with a trailing right turn, and Phase C services traffic from Railway Street
- The Princes Highway / Tarrawanna Road / Short Street signals have two phases. Phase A services traffic from Princes Highway and Phase B services traffic from Tarrawanna Road and Short Street.

3.4.5 Peak Hour Traffic Profile

The total traffic volumes across the 2022 surveyed intersections for the AM and PM peaks are shown in Figure 3.6. The peak profiles show that the roads around the Wilga Street Block are busiest between 8:15am and 9:30am in the morning peak. In the evening peak traffic volumes remain high between 4:00pm and 5:00pm before dropping sharply.

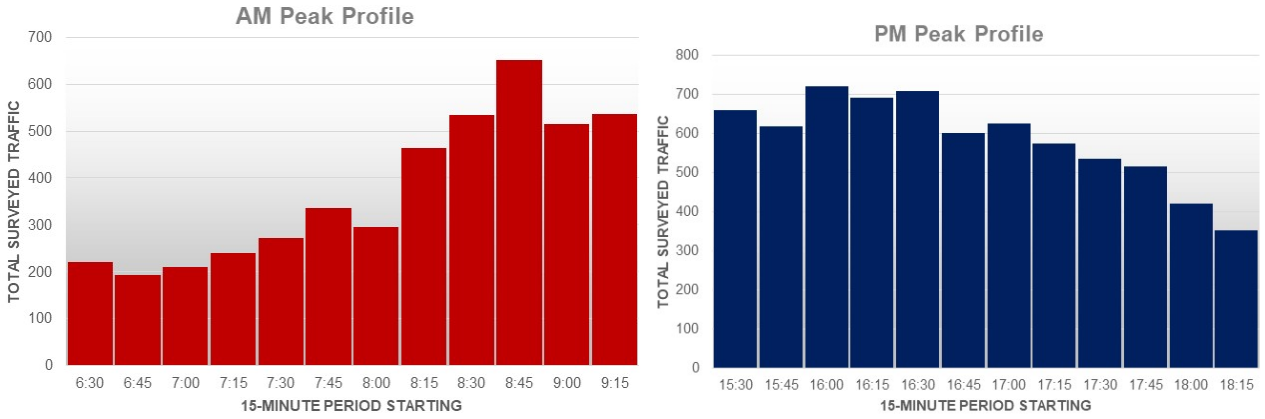


Figure 3.6: Surveyed Traffic Volumes – Peak Profiles

3.5 Existing Traffic Performance

3.5.1 Existing Traffic Models

The 2022 (base year) Aimsun models were developed for the AM and PM peaks and were calibrated and validated to reflect traffic network conditions that were surveyed in October 2022. The Aimsun Model study area is shown in Figure 3.7.

It is anticipated that future trips from the proposed redevelopment would use the Wilga Street / Rothery Street intersection to the north. This intersection was not included in the existing AIMSUN model. In consultation with Council, it was decided to assess the existing the future intersection performance using a SIDRA model.

Figure 3.7: **Modelling Areas**

3.5.2 Assessment Criteria

3.5.2.1 Overall Network Performance

The KPIs used for the comparison of scenarios across the entire cordon network were:

- Total Number of Vehicles –Total Traffic Demand
- Total Travel Time (VHT)– Cumulative time travelled by vehicles
- Total Distance Travelled (VKT) – Cumulative distance travelled by vehicles
- Total Delay (h) – Cumulative delays experienced by vehicles compared to free-flow speed
- Average Speed (km/h) – Average speed of vehicles
- Average Travel Time (min) – Average time of all vehicle trips
- Average Distance (km) – Average distance of all vehicle trips
- Average Delay (s) – Average delay of all vehicle trips
- Unreleased Trips – Unmet traffic demand due to congestion extending outside of the model
- Completed Trips – Total vehicles that have completed their trip and exited the model
- Incomplete Trips – Total vehicles that have started a trip but are still inside the model at the end of the simulation period

Network statistics were reported across the entire microsimulation period, which includes two (2) hours for evaluation and 30-minute warm-up and cool-down periods.

3.5.2.2 Intersection Performance

The intersection Level of Service (LoS) has been assessed based on overall delay in accordance with the TfNSW criteria defined in Table 3.4. This criterial is focused on service of vehicles moving through intersections and doesn't consider delays to pedestrians or cyclists.

Table 3.4: Intersection Level of Service Criteria

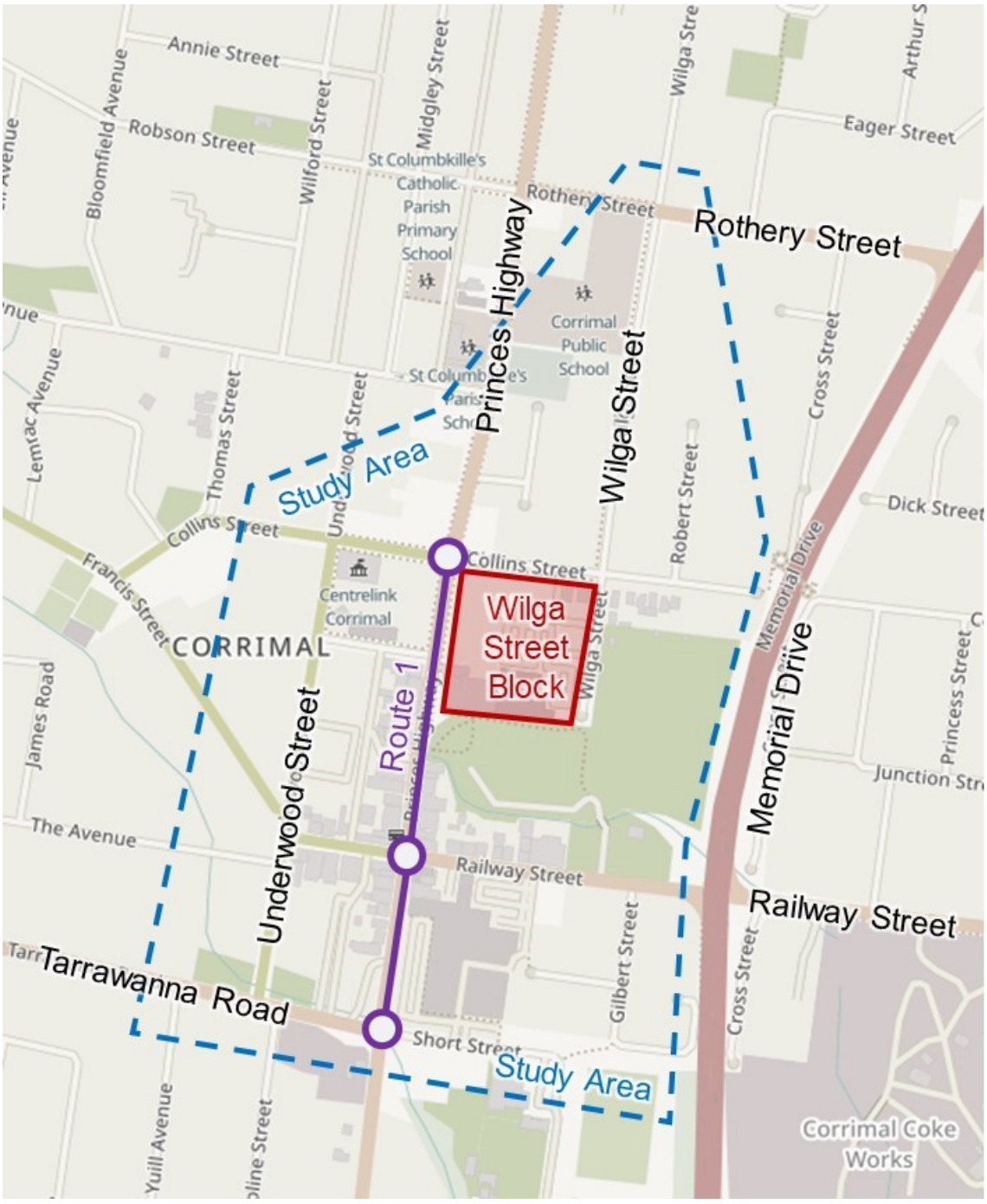
Level of Service (LoS)	Average Delay (s)	Description
A	<15	Good operation
B	15 to 29	Good with acceptable delays and spare capacity
C	29 to 43	Satisfactory
D	43 to 57	Operating near capacity
E	57 to 70	At capacity
F	>70	Unsatisfactory

As per the TfNSW guidelines, the delays presented in this report are:

- Average intersection delay for signalised intersections
- The highest turn delay for un-signalised intersections.

3.5.2.3 Travel Time

The Princes Highway travel time route shown in Figure 3.8 was used for the comparison of scenarios.



Basemap: OpenStreetMap

Figure 3.8: Travel Time Route for Scenario Comparison

3.5.3 Overall Network Performance

The performance statistics of the overall Aimsun network are outlined in Table 3.5.

The statistics show that the network is busier in the PM peak, and the proportion of completed trips shows that the network performs well in both peaks with no residual congestion.

Table 3.5: Network Statistics Summary – 2022 Base

Measure	2022 Base AM	2022 Base PM
Total Travel Time (hr)	160	239
Total Distance Travelled (km)	4,500	6,057
Total Delay (hr)	125	167
Average Speed (km/hr)	28.1	25.3
Average Travel Time (min)	1.47	1.62
Average Travel Distance (km)	0.69	0.68
Average Delay (sec)	69	68
Unreleased Trips	0	0
Completed Trips	6,493	8,786
Incomplete Trips	39	61
Total Number of Vehicles	6,532	8,858

3.5.4 Key Intersection Performance

Total intersection flows and delays in the 2022 Base Aimsun models at the key intersections are summarised in Table 3.6.

The Aimsun results were taken from the peak hour of the simulations, which are 8:00am – 9:00am and 4:00pm-5:00pm. The results from the Wilga Street / Rothery Street intersection are from the SIDRA model as it was not included within the Aimsun model area.

Table 3.6: 2022 Base Intersection Delays and Level of Service

Intersection	AM Peak		PM Peak	
	Volume (veh/hr)	Delay (s) (LoS)	Volume (veh/hr)	Delay (s) (LoS)
Wilga Street / Collins Street	355	9 (A)	542	15 (A)
Princes Highway / Collins Street	1,241	26 (B)	1,363	34 (C)
Princes Highway / Railway Street	1,609	25 (B)	1,557	24 (B)
Princes Highway / Tarrawanna Road / Short Street	1,248	15 (A)	1,426	22 (B)
Underwood Street / Collins Street	569	17 (B)	571	15 (B)
Wilga Street / Rothery Street*	825	14 (A)	826	13 (A)

**Results from SIDRA model*

Generally, the key intersections within the study area provide a good to satisfactory level of service during the weekday AM and PM peak periods.

3.5.5 Travel Times

Average travel times in the 2022 Base Aimsun models for the Princes Highway route outlined in Section 3.4.3 are shown in Figure 3.9 and Figure 3.10.

Detailed travel time results are included in **Appendix D**. Generally, when compared with the AM peak, the travel times during the PM peak are slightly longer.

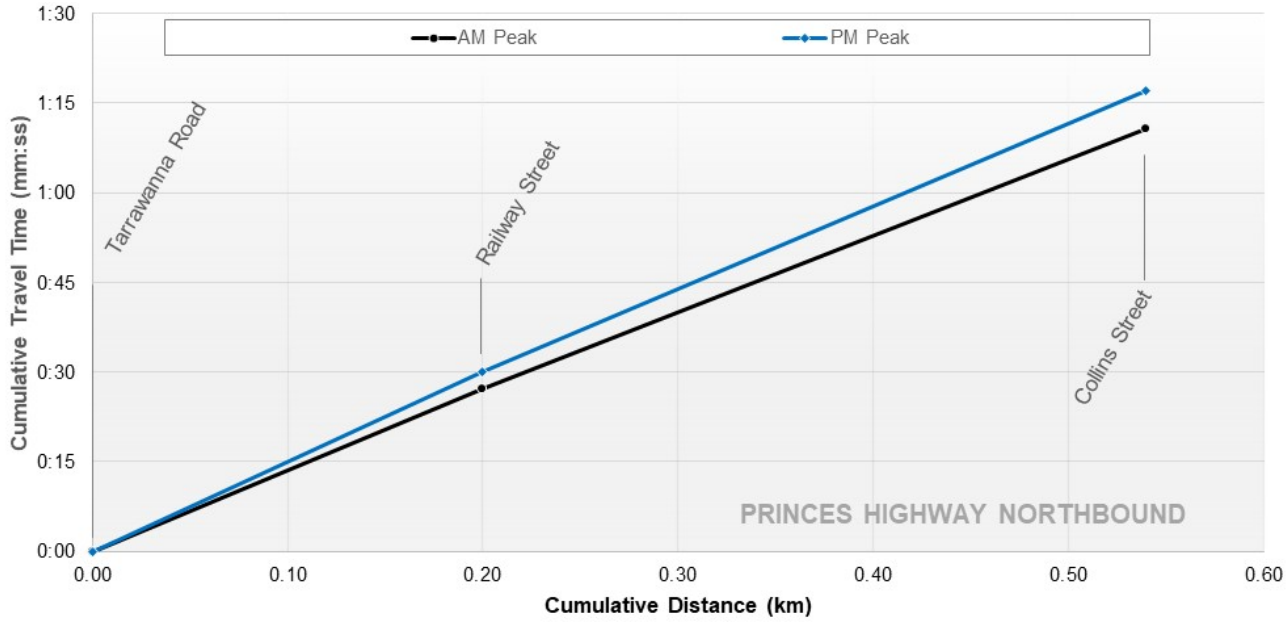


Figure 3.9: Modelled Travel Time – 2022 Princes Highway Northbound

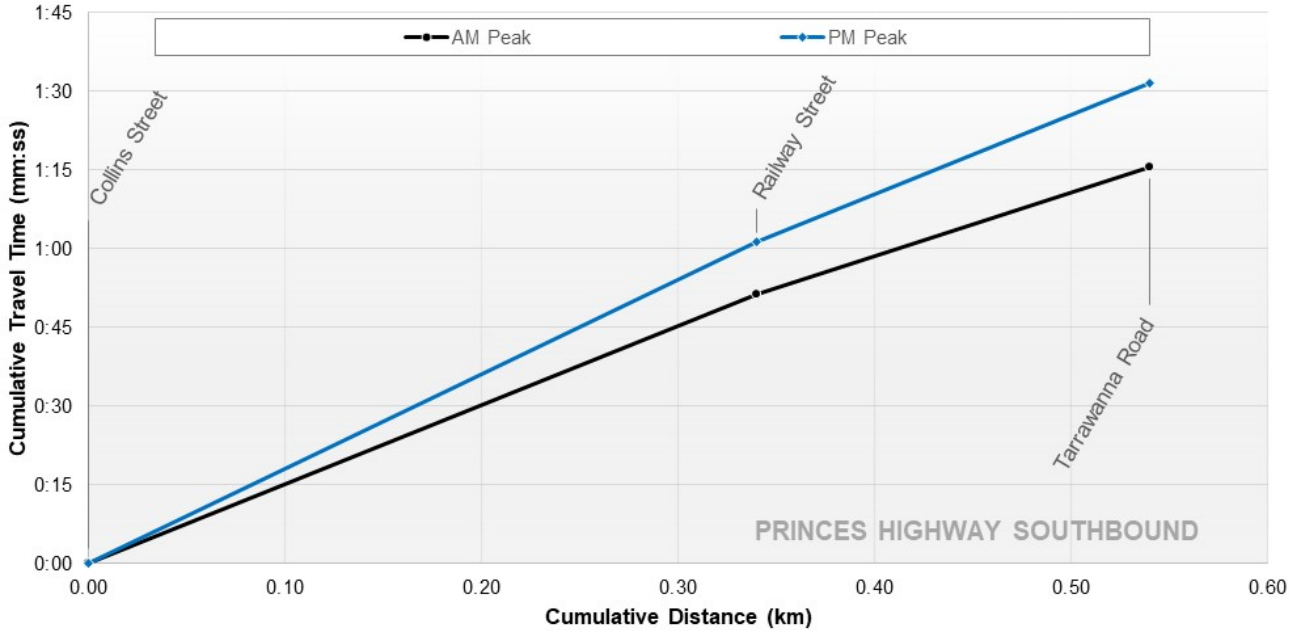


Figure 3.10: Modelled Travel Time – 2022 Princes Highway Southbound

4. 2036 Do Minimum Assessment

4.1 2036 Do Minimum Model

Cordon matrices from Council's TRACKS strategic traffic model were used to estimate the background traffic growth for the study area. The strategic model growth was applied to the 2022 Base Aimsun model demands to create the 2036 Do Minimum models' traffic demands. The models were then run and used to understand how background traffic growth would impact the local traffic network and to provide a baseline for comparing the Wilga Street Block uplift scenarios.

TRACKS 'cordon' demand matrices were provided by Council for 2021 and 2036 for the AM and PM hourly periods.

A review of the TRACKS cordon traffic demand matrices indicates that between 2021 and 2036, total traffic demands through and within the study area are expected to increase by approximately 8% in the AM peak and 13% in the PM peak

Difference matrices were calculated to understand the absolute increase and decrease of traffic movements between each zone pair over the 15-year period. The difference matrices were added to the 2022 Base Aimsun demands to create the 2036 Aimsun traffic demands.

The difference matrices included negative differences between some zone pairs, likely due to changes in traffic patterns from the strategic model cordon area. To ensure that the final Aimsun matrices did not result in any zone pairs with negative demands, the difference matrices were adjusted to remove any total negative demands whilst maintain a similar absolute increase in traffic across the network.

No changes to the road network were assumed between 2022 and 2036. The results were taken from the average of five microsimulation runs.

4.2 Modelling Outcomes

4.2.1 Overview

Comparisons between the 2022 Base and 2036 Do Minimum modelling results are summarised in the sections below.

4.2.2 Network Statistics

The 2022 Base AM and PM peak network statistics are compared with the 2036 Do Minimum scenarios in Table 4.1. The results show that the additional development demands will have a minor traffic performance impact in both peaks.

In the AM peak, average speeds decrease slightly from 28.1 to 25.4 km/h and average delays increase slightly from 69 to 71 seconds.

In the PM peak, average speeds decrease from 25.3 to 20.4 km/h, and average delays increase from 68 to 92 seconds.

The network statistics also indicates that the network operates with minimal congestion, with a small number of incomplete trips (vehicles inside the model at the end of the simulation) and an absence of trips that are unreleased due to congestion extending outside of the model area.

All network performance results are included in **Appendix B**.

Table 4.1: Network Statistics Comparison – 2022 Base and 2036 Do Minimum

Measure	2022 Base AM	2036 Do Minimum AM	2022 Base PM	2036 Do Minimum PM
Total Travel Time (hr)	160	209	239	330
Total Distance Travelled (km)	4,500	5,316	6,057	6,733
Total Delay (hr)	125	149	167	247
Average Speed (km/hr)	28.1	25.4	25.3	20.4
Average Travel Time (min)	1.47	1.66	1.62	2.04
Average Travel Distance (km)	0.69	0.70	0.68	0.70
Average Delay (sec)	69	71	68	92
Unreleased Trips	0	0	0	76
Completed Trips	6,493	7,490	8,786	9,580
Incomplete Trips	39	76	61	103
Total Number of Vehicles	6,532	7,567	8,858	9,760

4.2.3 Key Intersection Performance

The 2022 AM, PM peak demands and delays at key intersections are compared with the 2036 Do Minimum scenarios in Table 4.2 and Table 4.3.

The results show moderate increases in delays across all the key intersections between 2022 and 2036 in both AM and PM peaks. However, all key intersections are expected to perform at LoS C or better, which is satisfactory based on the TfNSW criteria.

Detailed intersection performance results are included in **Appendix C**.

Table 4.2: Key Intersection Performance – AM Do Minimum (8:00 – 9:00am)

Intersection	2022 Base AM		2036 Do Minimum AM	
	Volume (veh/hr)	Delay (s) (LoS)	Volume (veh/hr)	Delay (s) (LoS)
Wilga Street / Collins Street	*355*	*9 (A)*	408	11 (A)
Princes Highway / Collins Street	*1,241*	*26 (B)*	1,381	33 (C)
Princes Highway / Railway Street	*1,609*	*25 (B)*	1,726	30 (C)
Princes Highway / Tarrawanna Road / Short Street	*1,248*	*15 (A)*	1,360	17 (B)
Underwood Street / Collins Street	*569*	*17 (B)*	669	16 (B)
Wilga Street / Rothery Street*	*825*	*15 (B)*	1,014	39 (C)

**Results from SIDRA model*

Table 4.3: Key Intersection Performance – PM Do Minimum (4:00 – 5:00pm)

Intersection	2022 Base AM		2036 Do Minimum AM	
	Volume (veh/hr)	Delay (s) (LoS)	Volume (veh/hr)	Delay (s) (LoS)
Wilga Street / Collins Street	*542*	*15 (A)*	546	14 (A)
Princes Highway / Collins Street	*1,363*	*34 (C)*	1,335	42 (C)
Princes Highway / Railway Street	*1,557*	*24 (B)*	1,641	25 (B)
Princes Highway / Tarrawanna Road / Short Street	*1,426*	*22 (B)*	1,408	22 (B)
Underwood Street / Collins Street	*571*	*15 (B)*	603	16 (B)
Wilga Street / Rothery Street*	*764*	*14 (A)*	894	15 (B)

**Results from SIDRA model*

4.2.4 Queue Observations

While the network statistics and intersection performance results indicated that there were no significant traffic issues in the 2036 Do Minimum scenario, significant queuing was observed at the Princes Highway / Collins Street signals in the PM peak as shown in Figure 4.1. However, the model may over-estimate congestion as it does not consider any shifts in traffic between Princes Highway and Memorial Drive.

Without any changes to the intersection by 2036, queues for the right turn from Princes Highway southbound to Collins Street west will block the kerbside lane. The resulting queue is expected to extend over 200m north of Collins Street, and delays are expected to be up to 76s in the AM peak and 164s in the PM peak.

The issue was also observed in the AM peak, but occurrences were infrequent, and the resulting queues were shorter and cleared more quickly.

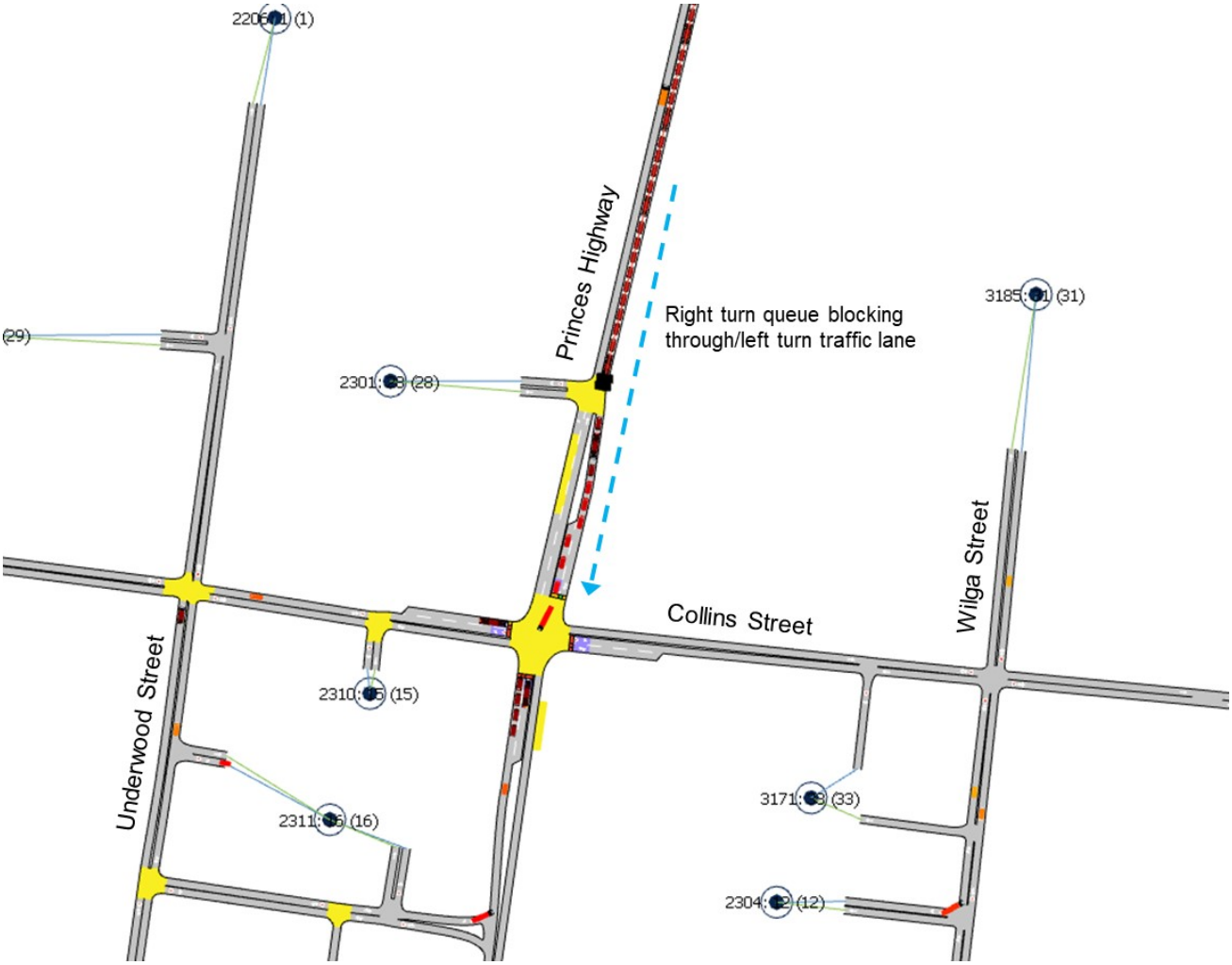


Figure 4.1: Modelled Queues – Princes Highway / Collins Street – Do Minimum PM

4.3 Do Minimum Upgrade Measures

4.3.1 Upgrade Concept

As described in 4.2.4, the Princes Highway / Collins Street signals are predicted to operate with significant congestion at the northern approach in the 2036 Do Minimum scenario.

In consultation with Council, an upgrade option was developed for the intersection, and was assessed using the Aimsun model. The proposed upgrade was to extend the right turn lane north by approximately 30m. Road widening may also be necessary as the existing lane widths are relatively narrow.

The proposed upgrade would allow for additional queuing space for the right turn and reduce the likelihood of queues blocking the kerbside lane.

The proposed intersection layout is shown in Figure 4.2.

Figure 4.2: Proposed Intersection Layout – Princes Highway / Collins Street

4.3.2 Upgrade Assessment

The 2036 Do Minimum AM and PM peak Aimsun models were updated to include the proposed upgrade at the Princes Highway / Collins Street signals. Signal timing was also adjusted to favour the northern approach

The intersection performance results are summarised in Table 4.4 and Table 4.5. The tables show a slight reduction of delays at Princes Highway / Collins Street in the PM peak, and no changes in level of service. Delays for the right turn from Princes Highway north to Collins Street west were reduced from 76s to 63s in the AM peak, and 164s to 61s in the PM peak.

Table 4.4: Key Intersection Performance –Do Minimum Upgrades (8:00 – 9:00am)

Intersection	2036 Do Minimum AM		2036 Do Minimum AM *plus* Upgrade	
	Volume (veh/hr)	Delay (s) (LoS)	Volume (veh/hr)	Delay (s) (LoS)
Wilga Street / Collins Street	408	11 (A)	410	11 (B)
Princes Highway / Collins Street	1,381	33 (C)	1,392	31 (C)
Princes Highway / Railway Street	1,726	30 (C)	1,734	26 (B)
Princes Highway / Tarrawanna Road / Short Street	1,360	17 (B)	1,364	16 (B)
Underwood Street / Collins Street	669	16 (B)	652	15 (B)

Table 4.5: Key Intersection Performance – Do Minimum Upgrades (4:00 – 5:00pm)

Intersection	2036 Do Minimum PM		2036 Do Minimum PM *plus* Upgrade	
	Volume (veh/hr)	Delay (s) (LoS)	Volume (veh/hr)	Delay (s) (LoS)
Wilga Street / Collins Street	546	14 (A)	558	15 (B)
Princes Highway / Collins Street	1,335	42 (C)	1,447	32 (C)
Princes Highway / Railway Street	1,641	25 (B)	1,656	24 (B)
Princes Highway / Tarrawanna Road / Short Street	1,408	22 (B)	1,354	21 (B)
Underwood Street / Collins Street	603	16 (B)	643	17 (B)

The network statistics summarised in Table 4.6 show that average delays have been slightly reduced from 71s to 68s in the AM peak, and greatly reduced from 92s to 66s in the PM peak. This reflects the reduced level of congestion observed in the model at the Princes Highway / Collins Street signals.

Table 4.6: Network Statistics Comparison –Do Minimum Upgrades

Measure	2036 Do Minimum AM	Do Min *plus* Upgrade AM	2036 Do Minimum PM	Do Min *plus* Upgrade PM
Total Travel Time (hr)	209	200	330	233
Total Distance Travelled (km)	5,316	5,311	6,733	6,075
Total Delay (hr)	149	143	247	165
Average Speed (km/hr)	25.4	26.6	20.4	26.1
Average Travel Time (min)	1.66	1.59	2.04	1.56
Average Travel Distance (km)	0.70	0.70	0.70	0.68
Average Delay (sec)	71	68	92	66
Unreleased Trips	0	0	76	817
Completed Trips	7,490	7,492	9,580	8,711
Incomplete Trips	76	74	103	232
Total Number of Vehicles	7,567	7,568	9,760	9,797

4.3.3 Travel Times

The travel times for the 2022 Base, 2036 Do Minimum and 2036 Do Minimum *plus* Upgrade are compared in Figure 4.3 to Figure 4.6.

While the queues and delays on southbound Princes Highway before Collins Street have been greatly reduced, the reduced signal time for northbound Princes Highway have slightly increased travel time between Railway Street and Collins Street in the PM peak.

Detailed travel time results are included in **Appendix D**.

Figure 4.3: Do Minimum Travel Time Comparison – Princes Highway Northbound 8-9AM

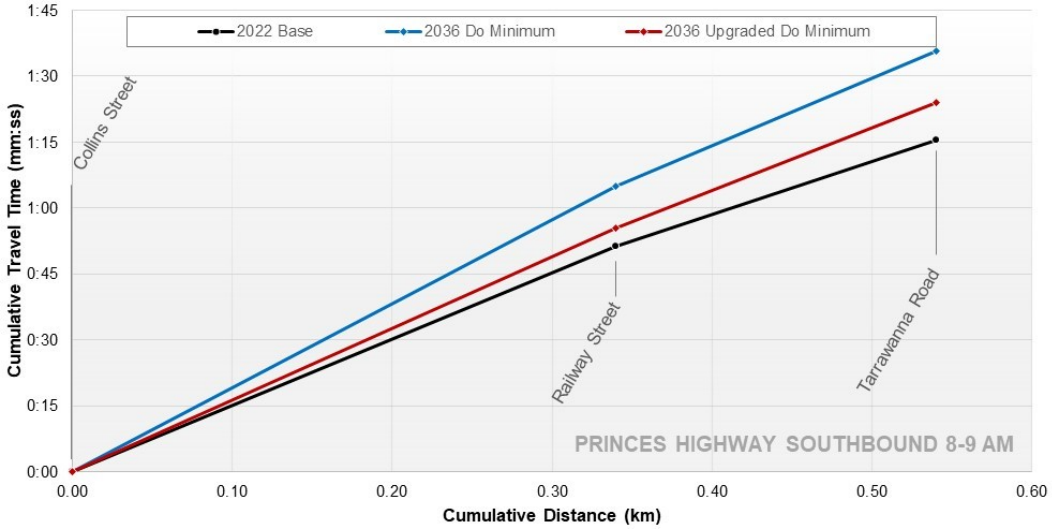


Figure 4.4: Do Minimum Travel Time Comparison – Princes Highway Southbound 8-9AM

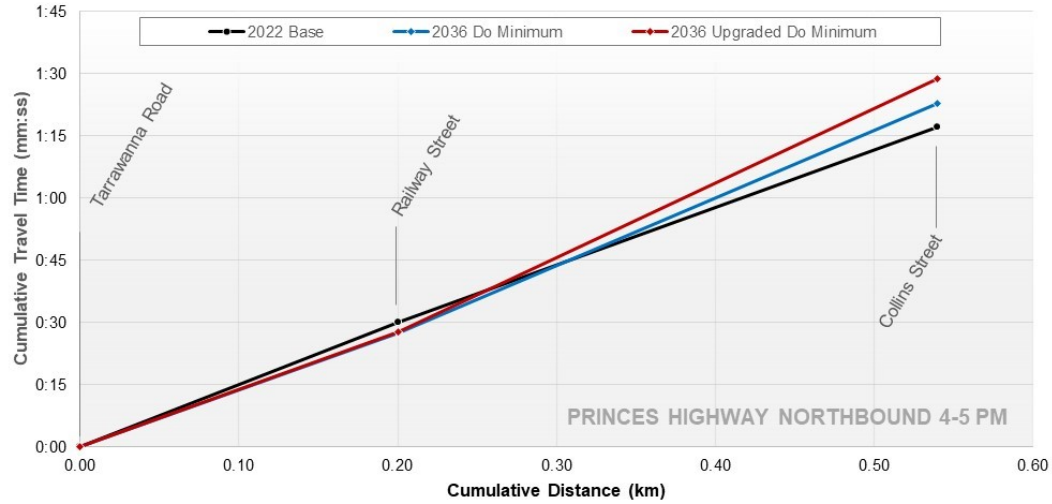


Figure 4.5: Do Minimum Travel Time Comparison – Princes Highway Northbound 4-5PM

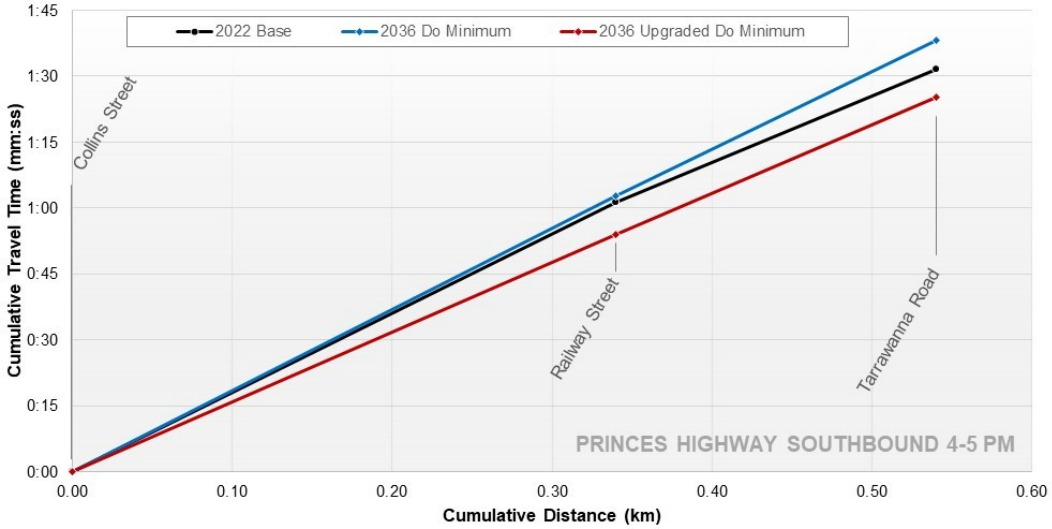


Figure 4.6: Do Minimum Travel Time Comparison – Princes Highway Southbound 4-5PM

5. WILGA STREET BLOCK UPLIFT ASSESSMENT

5.1 Traffic Generation

Two levels of density for the structure plan were proposed by Council:

- **Scenario A:** Theoretical base scenario of 1.5:1 floor space ratio (FSR) for all properties
- **Scenario B:** Increased FSR of 2:1 on selected properties

The proposed floor space ratios were used to estimate the maximum gross floor area (GFA) permitted for each lot within the Wilga Street Block. The GFA designated for residential dwellings were then converted to dwelling counts based on an average size of 85m^2 GFA per dwelling.

Table 5.1 summarises the estimated dwelling counts and GFA of other land uses in comparison with the existing situation. It is noted that the increased FSR in Scenario B is entirely assigned to residential dwellings.

Table 5.1: Future Development Assumptions

	Dwellings	Commercial GFA (m^2)	Specialty Retail GFA (m^2)	Supermarket GFA (m^2)	Exchange GFA (m^2)	RSL GFA (m^2)
Existing	21	750	4,126	2,000	719	1,387
Scenario A	204	300	11,000	4,300	719	1,387
Scenario B	312	300	11,000	4,300	719	1,387

Trip generation was calculated using the rates specified in the *TfNSW Guide to Traffic Generating Developments (2002)* (GTGD) and associated *Technical Direction TDT2013/04a*. The GTGD estimates trips based on gross leasable floor area (GLFA), and it was assumed that GLFA would be 70% of GFA. Residential trips were assumed to be 80% outbound and 20% inbound in the AM peak and vice versa in the PM peak, while retail and commercial trips were assumed to be 50% outbound and 50% inbound for both AM and PM peaks.

The estimated trip generation is summarised in Table 5.2.

Table 5.2: Future Trip Generation Estimates

	AM Outbound	AM Inbound	AM Total	PM Outbound	PM Inbound	PM Total
Existing	102	93	**195**	184	194	**378**
Scenario A	293	228	**521**	426	465	**891**
Scenario B	339	239	**578**	433	493	**926**

Trips were distributed based on the proportions between turns at these surveyed intersections:

- Wilga Street / Collins Street
- Princes Highway / Collins Street
- Wilga Street / Rothery Street.

The distributions are shown in Figure 5.1.

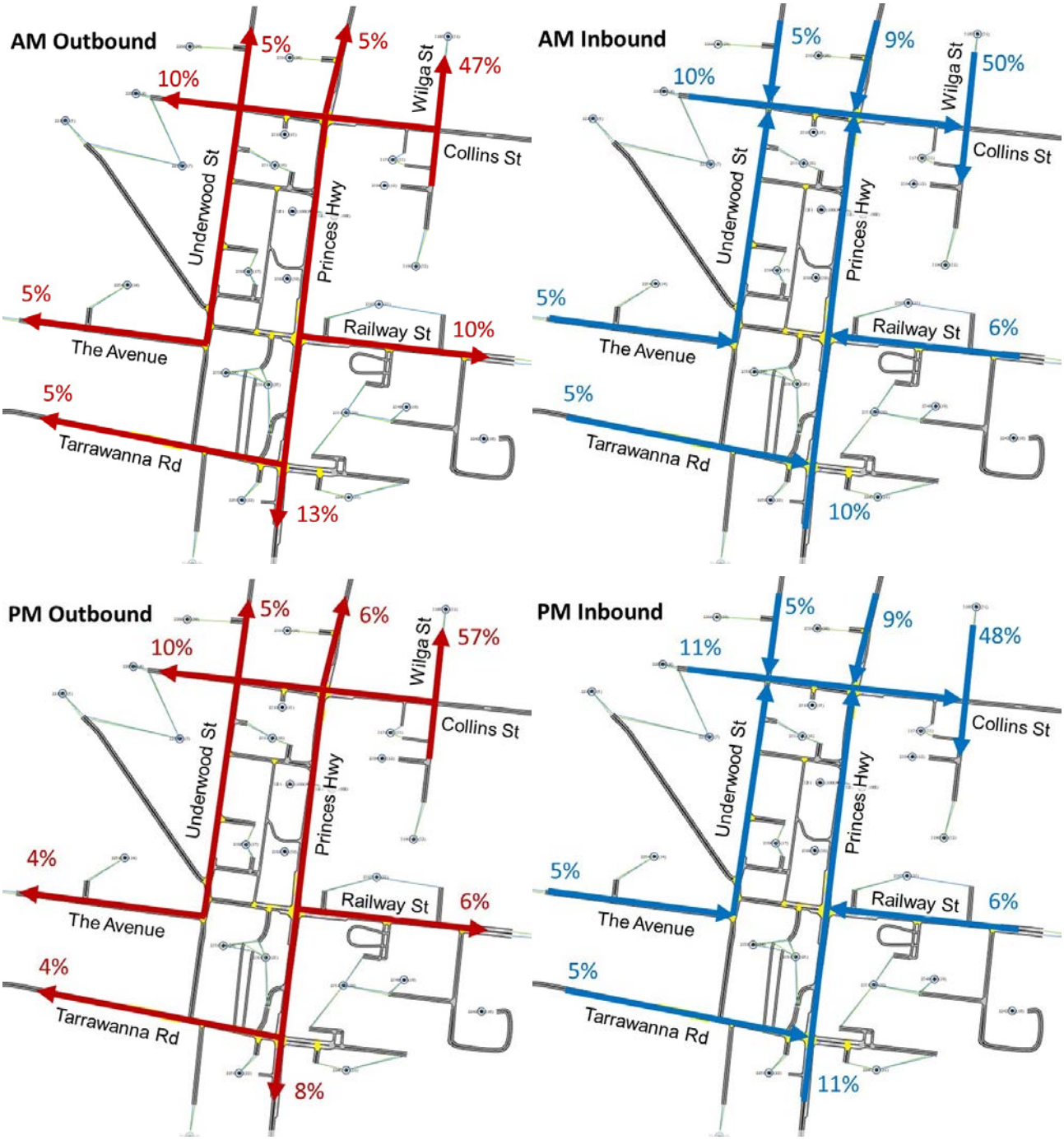


Figure 5.1: Wilga Street Block Trip Distribution

5.2 Model Scenarios

The scenarios which have been modelled and assessed are described in Table 5.3.

Table 5.3: Model Scenarios

Scenario	AM	PM	Traffic	Network
2036 Do Minimum *plus* Upgrade	☑	☑	▪ Background traffic growth	▪ 2022 Base Network ▪ + Princes Highway / Collins Street upgrade
2036 Scenario A	☑	☑	▪ Background traffic growth ▪ + Scenario A development traffic	
2036 Scenario B	☑	☑	▪ Background traffic growth ▪ + Scenario B development traffic	

5.3 Model Results

5.3.1 Network Statistics

The weekday AM and PM peak Aimsun network statistics for the 2036 scenarios are compared in Table 5.4 and Table 5.5.

Network performance in the AM peak was relatively similar across all the modelled scenarios.

In the PM peak, the additional development traffic resulted in increased average delays (66s to 80s) and reduced average speeds (26.1 to 23.4 km/h) between the Do Minimum and Scenario A, and minimal differences between Scenario A and Scenario B.

All network performance results are included in **Appendix B**.

Table 5.4: Network Statistics Comparison – With Development AM Peak

Measure	Do Minimum *plus* Upgrade	Scenario A	Scenario B
Total Travel Time (hr)	*200*	232	238
Total Distance Travelled (km)	*5,311*	5,860	5,956
Total Delay (hr)	*143*	163	167
Average Speed (km/hr)	*26.6*	25.3	25.0
Average Travel Time (min)	*1.59*	1.64	1.64
Average Travel Distance (km)	*0.70*	0.69	0.69
Average Delay (sec)	*68*	69	69
Unreleased Trips	*0*	0	0
Completed Trips	*7,492*	8,425	8,595
Incomplete Trips	*74*	72	75
Total Number of Vehicles	*7,568*	8,507	8,689

Table 5.5: Network Statistics Comparison – With Development PM Peak

Measure	Do Minimum *plus* Upgrade	Scenario A	Scenario B
Total Travel Time (hr)	*233*	321	335
Total Distance Travelled (km)	*6,075*	7,515	7,652
Total Delay (hr)	*165*	244	257
Average Speed (km/hr)	*26.1*	23.4	22.8
Average Travel Time (min)	*1.56*	1.73	1.78
Average Travel Distance (km)	*0.68*	0.68	0.68
Average Delay (sec)	*66*	79	82
Unreleased Trips	*817*	0	0
Completed Trips	*8,711*	11,003	11,203
Incomplete Trips	*232*	88	78
Total Number of Vehicles	*9,797*	11,111	11,298

5.3.2 Key Intersection Performance

The weekday AM and PM peak key intersection performance for the 2036 scenarios are compared in Table 5.6 and Table 5.7.

At Wilga Street / Collins Street, additional development traffic will increase delays at the southern Wilga Street approach. In the AM peak, delays are expected to increase slightly from 11s in the Do Minimum to 16s in Scenario A and 21s in Scenario B. Delays are more pronounced in the PM peak, increasing from 15s in the Do Minimum to 43s in Scenario A and 47s in Scenario B.

At Princes Highway / Collins Street, PM peak delays increased moderately from 32s in the Do Minimum to 37s in Scenario A and 41s in Scenario B. This was predominantly due to increased delays on the eastern Collins Street approach caused by additional outbound traffic from the Block.

While delays have increased at most key intersections in the Aimsun model, the overall levels of service remained acceptable based on the TfNSW criteria at LoS D or better.

At Wilga Street / Rothery Street, the SIDRA modelling showed that the additional development traffic will cause excessive delays and queues. The right turn from the south Wilga Street approach to Rothery Street is expected to carry approximately 100 additional vehicles in both Scenario A and B and in both AM and PM peaks. The additional volumes are expected to greatly exceed the capacity of the stop sign, with unsatisfactory levels of service (LoS F) in both 'with development' scenarios.

Detailed intersection performance results are included in **Appendix C**.

Table 5.6: Key Intersection Performance – With Development (8:00 – 9:00am)

Intersection	Do Minimum *plus* Upgrade		Scenario A		Scenario B	
	Volume (veh/hr)	Delay (s) (LoS)	Volume (veh/hr)	Delay (s) (LoS)	Volume (veh/hr)	Delay (s) (LoS)
Wilga Street / Collins Street	*410*	*11 (A)*	744	16 (B)	795	21 (B)
Princes Highway / Collins Street	*1,392*	*31 (C)*	1,552	38 (C)	1,585	38 (C)
Princes Highway / Railway Street	*1,734*	*26 (B)*	1,753	27 (B)	1,784	28 (B)
Princes Highway / Tarrawanna Road / Short Street	*1,364*	*16 (B)*	1,380	18 (B)	1,402	18 (B)
Underwood Street / Collins Street	*652*	*15 (B)*	809	20 (B)	810	23 (B)
Wilga Street / Rothery Street*	*1,014*	*39 (C)*	1,178	702 (F)	1,207	828 (F)

**Results from SIDRA model*

Table 5.7: Key Intersection Performance – With Development (4:00 – 5:00pm)

Intersection	Do Minimum *plus* Upgrade		Scenario A		Scenario B	
	Volume (veh/hr)	Delay (s) (LoS)	Volume (veh/hr)	Delay (s) (LoS)	Volume (veh/hr)	Delay (s) (LoS)
Wilga Street / Collins Street	*558*	*15 (B)*	1,044	43 (D)	1,082	47 (D)
Princes Highway / Collins Street	*1,447*	*32 (C)*	1,659	37 (C)	1,714	41 (C)
Princes Highway / Railway Street	*1,656*	*24 (B)*	1,752	28 (B)	1,802	29 (C)
Princes Highway / Tarrawanna Road / Short Street	*1,354*	*21 (B)*	1,479	21 (B)	1,503	21 (B)
Underwood Street / Collins Street	*643*	*17 (B)*	746	24 (B)	765	20 (B)
Wilga Street / Rothery Street*	*894*	*15 (B)*	1,156	400 (F)	1,175	431 (F)

**Results from SIDRA model*

5.3.3 Queue Observations

While overall delays are satisfactory at Wilga Street / Collins Street, queues were observed on the southern approach extending into the Wilga Street Block. While the congestion would not extend to other areas of the network, queued vehicles exiting the car park may reduce visibility between pedestrians and traffic entering the car park and increase the likelihood of collisions.

The intervisibility issue may be resolved through design details such as separating the entry and exit driveways into the site to prevent potential queues at the exit from blocking visibility of pedestrians around the entry, and to reduce pedestrian crossing distances.

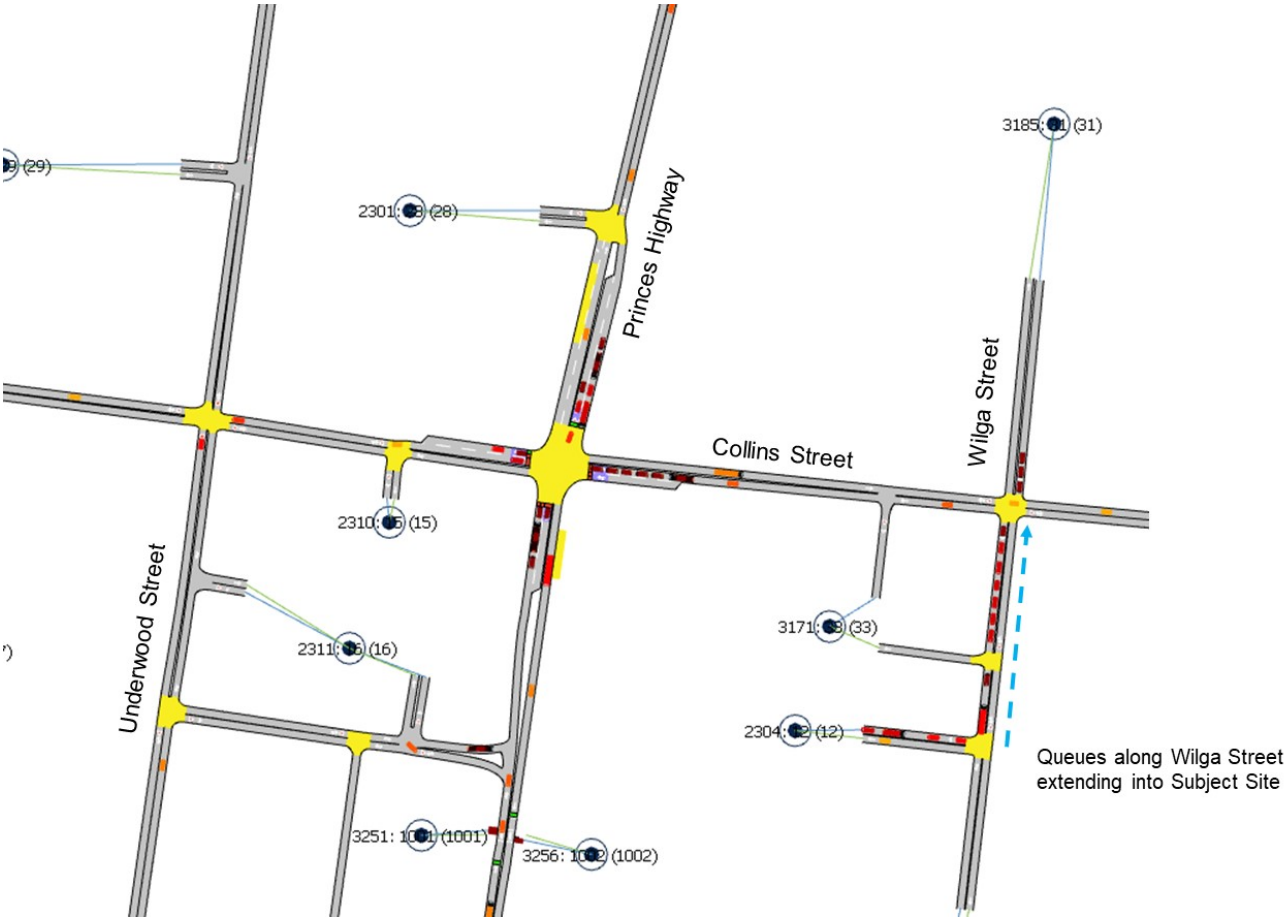


Figure 5.2: Modelled Queues – Princes Highway / Collins Street – With Development PM

5.3.4 Travel Times

The travel times for the 2036 Do Minimum *plus* Upgrade, Scenario A and Scenario B are compared in Figure 5.3 to Figure 5.6.

The results show that the travel times with the development (Scenarios A and B) will have slightly increased travel times compared to the Do Minimum, which shows that the additional development traffic will have a minor impact on traffic conditions on Princes Highway south of Collins Street. Generally, the increases in travel times are between 10 and 15s.

Detailed travel time results are included in **Appendix D**.

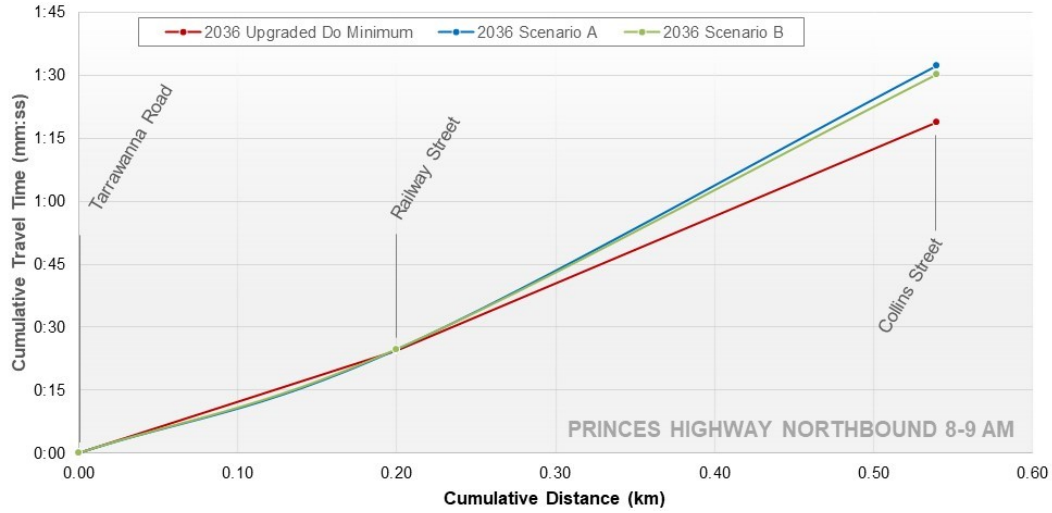


Figure 5.3: Development Travel Time Comparison – Princes Highway Northbound 8-9AM

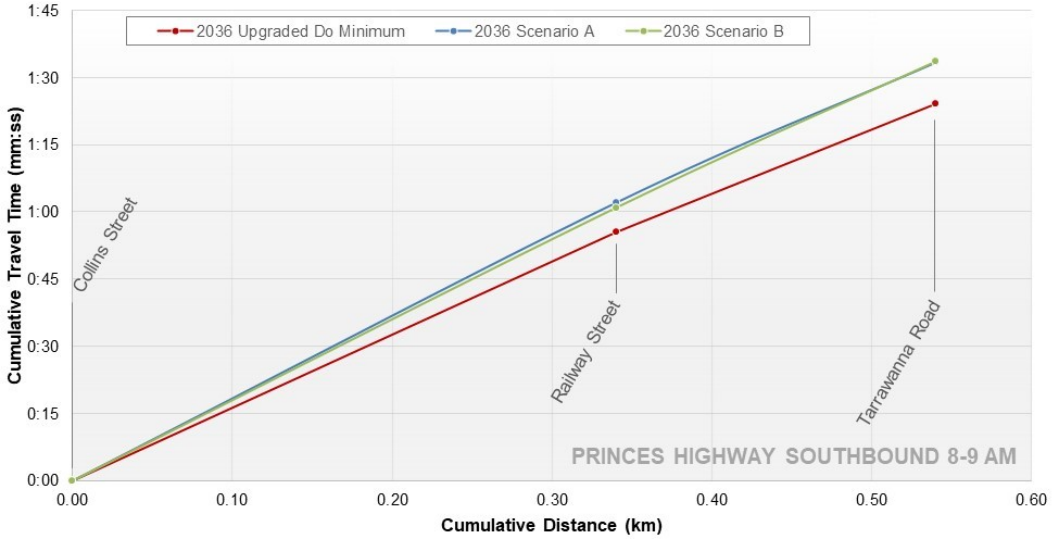


Figure 5.4: Development Travel Time Comparison – Princes Highway Southbound 8-9AM

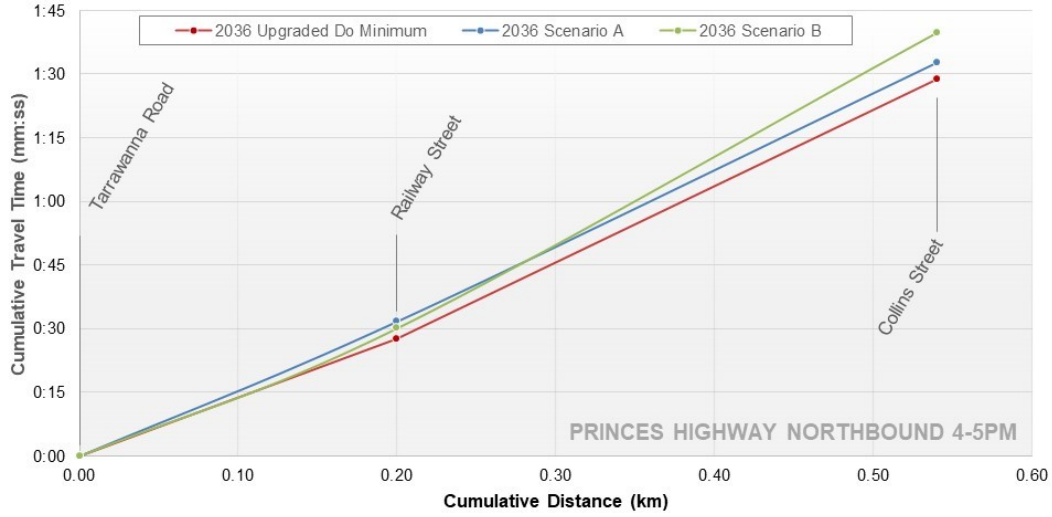


Figure 5.5: Development Travel Time Comparison – Princes Highway Northbound 4-5PM

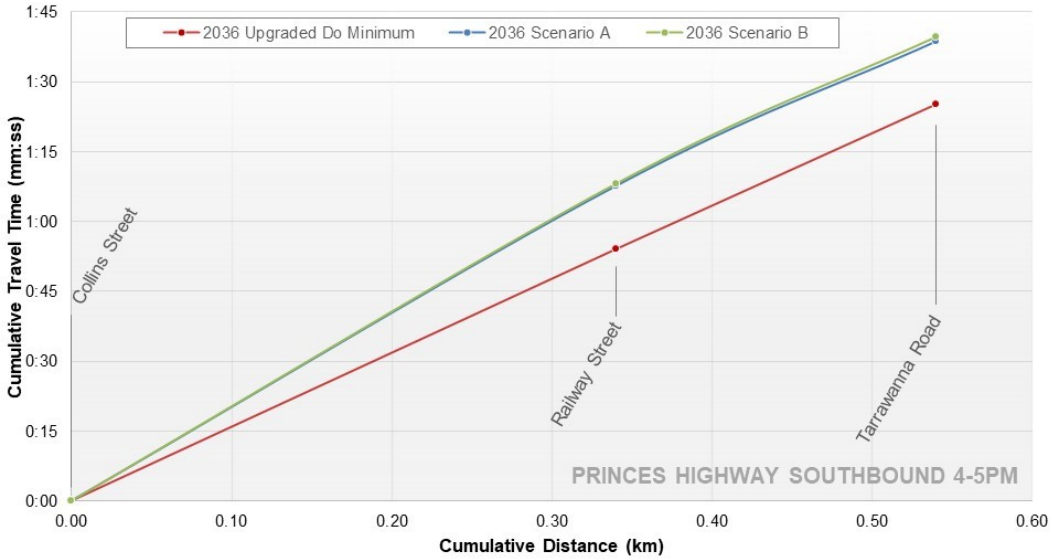


Figure 5.6: Development Travel Time Comparison – Princes Highway Southbound 4-5PM

5.4 Assessment Outcomes

The modelling results demonstrate:

- The proposed uplift of the Wilga Street Block to 1.5:1 FSR will contribute to excessive delays and queues Wilga Street / Rothery Street intersection
- Other intersections will have increased delays, but are expected to operate within acceptable limits of delays and queues
- Queues from the development in the PM peak may cause queues along northbound Wilga Street extending back from Collins Street and into the development. However, these queues are locally contained and are not expected to influence other parts of the road network
- The scenario with 2:1 FSR at selected sites results in minimal increases in delays and queues compared to the 1.5:1 FSR only scenario.

6. MITIGATION MEASURES

6.1 Wilga Street /Collins Street

In consultation with Council, a roundabout was proposed to reduce queues from the southern Wilga Street / Collins Street approach. The roundabout was modelled in Aimsun, and the results are summarised in Table 6.1 and Table 6.2.

Detailed SIDRA results are included in **Appendix E**.

The roundabout is expected to release more eastbound traffic towards the Princes Highway / Collins Street signals, so those results were also shown for comparison.

Table 6.1: Wilga Street / Collins Street Upgrade – Scenario A

Peak	Intersection	Scenario A		Scenario A *plus* Roundabout	
		Volume (veh/hr)	Delay (s) (LoS)	Volume (veh/hr)	Delay (s) (LoS)
AM Peak	Wilga Street / Collins Street	744	16 (B)	742	8 (A)
	Princes Highway / Collins Street	1,552	38 (C)	1,538	41 (D)
PM Peak	Wilga Street / Collins Street	1,044	43 (D)	1,073	16 (B)
	Princes Highway / Collins Street	1,659	37 (C)	1,685	45 (D)

Table 6.2: Wilga Street / Collins Street Upgrade – Scenario B

Model Period	Intersection	Scenario B		Scenario B *plus* Roundabout	
		Volume (veh/hr)	Delay (s) (LoS)	Volume (veh/hr)	Delay (s) (LoS)
AM Peak	Wilga Street / Collins Street	795	21 (B)	798	9 (A)
	Princes Highway / Collins Street	1,585	38 (C)	1,579	43 (D)
PM Peak	Wilga Street / Collins Street	1,082	47 (D)	1,106	26 (B)
	Princes Highway / Collins Street	1,714	41 (C)	1,782	48 (D)

The modelling results show that the roundabout would significantly reduce average delays at Wilga Street / Collins Street in both Scenarios A and B and in both peak periods. In Scenario A, average delays would be reduced by 8s in the AM peak and 27s in the PM peak. In Scenario B, average delays are reduced by 11s in the AM peak and 21s in the PM peak. While residual delays in Scenario B are slightly higher than Scenario A, they are both classified as Level of Service B which represents good to acceptable levels of delay.

Delays at the Princes Highway signal are increased in both Scenarios A and B and in both peak periods, but the overall delays remain at a satisfactory level.

A concept for the Wilga Street / Collins Street roundabout is shown in Figure 6.1.

Figure 6.1: Proposed Roundabout Layout – Wilga Street / Collins Street

6.2 Wilga Street / Rothery Street

The preferred intersection upgrade for the Wilga Street / Rothery Street intersection is a single-lane roundabout, which would help facilitate the high amount of right-turning traffic at the intersection. As shown by the SIDRA results in Table 6.4, the overall delays at the intersection were significantly reduced to less than 15s in both Scenarios A and B and in both peak periods.

Detailed SIDRA results are included in **Appendix E**.

The introduction of a roundabout is expected to slightly increase travel times on Rothery Street, as the existing intersection is free-flow for Rothery Street traffic. Queues from the roundabout are extremely unlikely to reach the Princes Highway / Rothery Street signals, as the 95th percentile queues of 20m are much less than the 130m between Wilga Street and Princes Highway.

Table 6.3: Wilga Street / Rothery Street Upgrade – Scenario A

Intersection	Peak Period	Scenario A *existing*			Scenario A *plus* Roundabout		
		Volume (veh/hr)	Delay (s) (LoS)	95%ile Queue (m)	Volume (veh/hr)	Delay (s) (LoS)	95%ile Queue (m)
Wilga Street / Rothery Street	AM	1,178	702 (F)	1,432	1,178	8 (A)	16
	PM	1,156	400 (F)	1,205	1,156	7 (A)	18

Table 6.4: Wilga Street / Rothery Street Upgrade – Scenario B

Intersection	Peak Period	Scenario B *existing*			Scenario B *plus* Roundabout		
		Volume (veh/hr)	Delay (s) (LoS)	95%ile Queue (m)	Volume (veh/hr)	Delay (s) (LoS)	95%ile Queue (m)
Wilga Street / Rothery Street	AM	1,207	828 (F)	1,545	1,207	14 (A)	18
	PM	1,175	431 (F)	1,237	1,175	13 (A)	19

A concept for the Wilga Street / Rothery Street roundabout is shown in Figure 6.2.

Figure 6.2: Proposed Roundabout Layout – Wilga Street / Rothery Street

6.3 Other Upgrade Impacts

With the roundabouts on Wilga Street at Rothery Street and Collins Street and the substantial reduction in delays at these intersections, it is likely that additional traffic will be attracted to use Wilga Street as an alternative route to Princes Highway.

6.4 Staging Assessment

6.4.1 Staging Assessment Scenarios

It is likely that the Block will be developed in a staged manner, so it is necessary to understand when each of the proposed upgrades would be required. To accomplish this, additional traffic modelling scenarios were created in AIMSUN and SIDRA to assess the performance of the critical intersections when half of the Block has been redeveloped. The partial development scenarios were assessed for the 'theoretical base' level of 1.5 FSR (Scenario A) and the 'increased FSR on some sites' level of 1.5-2 FSR (Scenario B)

The partial development models will be based on 2036 Scenario A and Scenario B models, but assuming 50% of the traffic growth from the complete development, as shown in Table 6.5

Table 6.5: Model Scenarios – Partial Development

Scenario	AM	PM	Traffic	Network
2036 Scenario A Partial	☑	☑	▪ Background traffic growth ▪ + 50% of Scenario A development traffic	▪ 2022 Base Network ▪ + Princes Highway / Collins Street upgrade
2036 Scenario B Partial	☑	☑	▪ Background traffic growth ▪ + 50% of Scenario B development traffic	

6.4.2 Model Outcomes

The weekday AM and PM peak intersection performance results for the partial development scenarios are compared in Table 6.6 to Table 6.9.

The results show that in both Scenario A and Scenario B with partial development, LoS and delays at Wilga Street / Collins Street were improved compared to the full development scenarios. In particular, the PM delays were reduced from 43s to 24s in Scenario A, and from 47s to 26s in Scenario B, and the excessive queueing described in Section 5.3.3 was not observed in the partial development models. LoS and delay at the Princes Highway / Collins Street signals were also slightly improved.

Given the Wilga Street / Collins Street is expected to operate at a good level of service with acceptable delays and spare capacity in the partial development scenario, the Wilga Street / Collins Street roundabout will be required by the completion of 100% of the development.

The Wilga Street / Rothery Street signals will operate at LoS F in the AM peak partial development scenarios with average delays of over 400s in both Scenario A and Scenario B. It is therefore recommended that the Wilga Street / Rothery Street roundabout is implemented before the completion of 50% of the development.

Table 6.6: Staging Assessment Results – Scenario A (8:00 – 9:00am)

Intersection	Do Minimum *plus* Upgrade		Scenario A *Full Development*		Scenario A *Partial Development*	
	Volume (veh/hr)	Delay (s) (LoS)	Volume (veh/hr)	Delay (s) (LoS)	Volume (veh/hr)	Delay (s) (LoS)
Wilga Street / Collins Street	*410*	*11 (A)*	744	16 (B)	570	12 (A)
Princes Highway / Collins Street	*1,392*	*31 (C)*	1,552	38 (C)	1,475	34 (C)
Wilga Street / Rothery Street	*1,014*	*39 (C)*	1,178	702 (F)	1,096	402 (F)

Table 6.7: Staging Assessment Results – Scenario B (8:00 – 9:00am)

Intersection	Do Minimum *plus* Upgrade		Scenario B *Full Development*		Scenario B *Partial Development*	
	Volume (veh/hr)	Delay (s) (LoS)	Volume (veh/hr)	Delay (s) (LoS)	Volume (veh/hr)	Delay (s) (LoS)
Wilga Street / Collins Street	*410*	*11 (A)*	795	21 (B)	592	14 (B)
Princes Highway / Collins Street	*1,392*	*31 (C)*	1,585	38 (C)	1,501	34 (C)
Wilga Street / Rothery Street	*1,014*	*39 (C)*	1,207	828 (F)	1,111	447 (F)

Table 6.8: Staging Assessment Results – Scenario A (4:00 – 5:00pm)

Intersection	Do Minimum *plus* Upgrade		Scenario A *Full Development*		Scenario A *Partial Development*	
	Volume (veh/hr)	Delay (s) (LoS)	Volume (veh/hr)	Delay (s) (LoS)	Volume (veh/hr)	Delay (s) (LoS)
Wilga Street / Collins Street	*558*	*15 (B)*	1,044	43 (D)	838	24 (B)
Princes Highway / Collins Street	*1,447*	*32 (C)*	1,659	37 (C)	1,589	35 (C)
Wilga Street / Rothery Street	*894*	*15 (B)*	1,156	400 (F)	1,036	32 (C)

Table 6.9: Staging Assessment Results – Scenario B (4:00 – 5:00pm)

Intersection	Do Minimum *plus* Upgrade		Scenario B *Full Development*		Scenario B *Partial Development*	
	Volume (veh/hr)	Delay (s) (LoS)	Volume (veh/hr)	Delay (s) (LoS)	Volume (veh/hr)	Delay (s) (LoS)
Wilga Street / Collins Street	*558*	*15 (B)*	1,082	47 (D)	874	26 (B)
Princes Highway / Collins Street	*1,447*	*32 (C)*	1,714	41 (C)	1,596	34 (C)
Wilga Street / Rothery Street	*894*	*15 (B)*	1,175	431 (F)	1,043	32 (C)

7. ACTIVE AND PUBLIC TRANSPORT

7.1 Overview

Improved public transport and active transport access to the Wilga Street Block (the Block):

- Supports local access to the Wilga Street Block and Corrimal Town Centre
- Reduces private vehicle trips
- Encourages more active and healthier lifestyle and habits.

A review of existing and proposed pedestrian and bicycle routes and facilities was undertaken with potential improvements identified to support the development, including:

- Proposed shared paths and off-road links for improved local access
- Additional pedestrian crossings and access points to/from the Block.

Bus access to the Block was also reviewed to determine the suitability of existing routes and stops and provide recommendations to improve public transport.

7.2 Active Transport

7.2.1 Council Planned Improvements

Council has advised that a planned cycle route has been identified along Collins Street and Wilga Street, as shown in Figure 7.1. At this stage, it is understood that some form of cycling infrastructure along this route is planned to support the route.

Source: Wollongong City Council

Figure 7.1: Planned Cycle Routes

7.2.2 Recommended New / Modified Active Transport Facilities

Suggested active transport improvements for encouraging the uptake of walking and cycling are described below.

End of Trip Facilities

The Wilga Street Block is expected to be a major destination for trips associated with shopping and recreation, as the existing car park is convenient for visitors to other parts of the town centre and the adjacent parks. To encourage a mode shift from private vehicles to cycling for those trips, a similar level of convenience should be provided for bicycle parking within the Block. Connections between bicycle parking areas, local shared paths and other parts of the town centre should be as direct as possible, and should be targeted during the ongoing development of the site through permeability in urban design.

Consideration should be given to the security of bicycle parking areas and could be achieved by placing parking in areas with high pedestrian traffic for passive surveillance in line with CPTED principles or in bicycle-parking sheds with video surveillance. Directional signage may also increase awareness of the availability and convenience of bicycle parking.

Off-road Shared Path and Separated Cycle Routes

The majority of trips to the Wilga Street Block and surrounds are expected to be related to shopping or recreation, so cycling trips through the area are expected to be casually paced. To cater for these types of trips, the cycle routes surrounding the Block should be physically separated from traffic. Given the role of the Block as a trip destination, a low-speed shared path environment is recommended to improve safety and amenity of the planned cycle routes to and from the site.

The local cycle routes should aim to connect the Block with the surrounding residential areas to encourage a shift from driving to cycling for shopping trips and park visitors.

While subject to feasibility studies and detailed design, the cycle route should aim to minimise the number of vehicle driveways crossings. For example, the cycle path adjacent to the Block on Collins Street would preferentially run along the southern side of Collins Street (site frontage) to avoid numerous driveway crossovers (including the frequently used 7-Eleven access).

7.3 Public Transport

7.3.1 Public Transport Impacts

The Wilga Street Block is conveniently located in close proximity to bus stops along Princes Highway which are serviced by the routes listed in Section 3.2.1. The proposed uplift may increase demand for buses along Princes Highway for trips between Corrimal and Wollongong, but it is not expected to have a significant impact on bus capacity, as the development would represent a small fraction of the total catchment of the bus routes.

7.3.2 Recommended Public Transport Improvements

Public transport usage could be encouraged by improving amenity and convenience with the following measures:

- Improving weather sheltering between the Block and Princes Highway bus stops
- Ensuring footpaths between the Block and Corrimal railway station are well maintained
- Improving and maintaining bus stop amenities, including compliance with the Disability Standards for Accessible Public Transport (DSAPT) through the provision of safe boarding areas and TGSIs
- Display of local public and active transport maps to advise visitors and residents of alternative transport options

Increasing the frequency of public transport services could potentially increase the mode share, but this would require extensive consultation between TfNSW, the operator, Council and local residents. Further work would be required to understand the impacts versus benefits of these proposals.

8. CONCLUSIONS

The key findings from the modelling assessment are as follows:

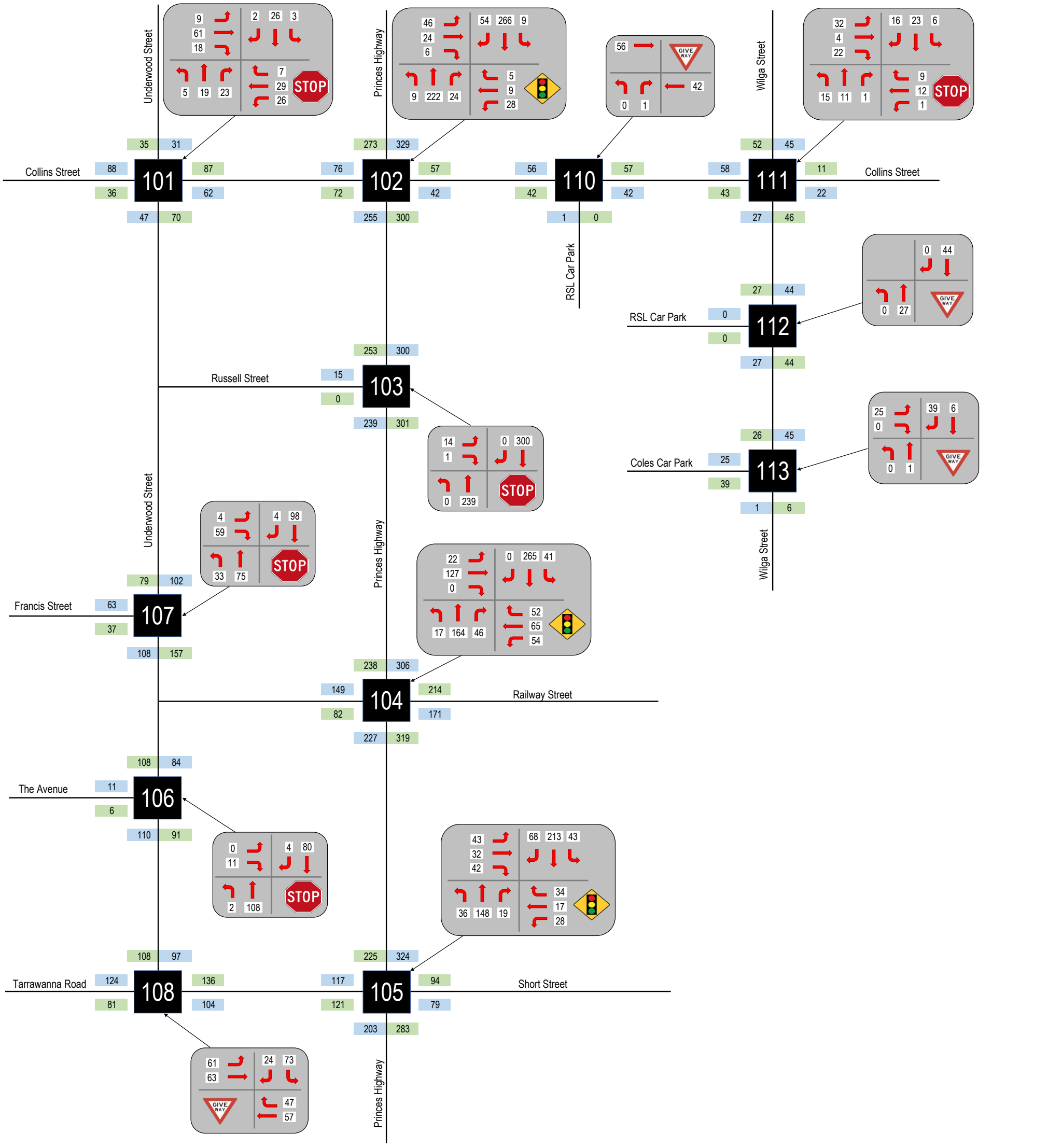
- The proposed revisions to the planning controls of the Wilga Street Block to allow a maximum floor space ratio (FSR) of 1.5:1 is expected to generate an additional 326 vehicle trips in the AM peak and 513 vehicle trips in the PM peak compared to the existing situation
- An increased FSR allowance of 2:1 at selected sites is expected to generate an additional 383 vehicle trips in the AM peak and 548 vehicle trips in the PM peak compared to the existing situation
- Without any upgrades, the additional traffic is expected to result in:
  - Increased travel times along Princes Highway between Collins Street and Tarrawanna Street by between 10 and 15s in both directions and both peak periods.
  - Unacceptable levels of queuing and delays at the Wilga Street / Rothery Street intersections, which is currently a stop-controlled intersection
  - Queues along northbound Wilga Street between the development and the Collins Street intersection, but would not extend to affect other parts of the road network.
- Minimal differences in traffic network impacts are expected between the 1.5:1 FSR and 1.5-2:1 FSR scenarios
- At Wilga Street / Collins Street, upgrading the intersection to a roundabout would provide satisfactory outcomes in terms of delays and queues in both Scenarios A and B, and will cause minimal impacts to the Princes Highway / Collins Street intersection
- At Wilga Street / Rothery Street, upgrading the intersection to a roundabout would provide satisfactory outcomes in terms of delays and queues in both Scenarios A and B, and it is extremely unlikely that eastbound queues along Rothery Street will reach the Princes Highway / Rothery Street signals
- However, implementing roundabouts at both Wilga Street / Collins Street and Wilga Street / Rothery Street will make Wilga Street a more attractive route (with less congestion) and it could be used as an alternative route to the Princes Highway
- In both 1.5:1 FSR and 1.5-2:1 FSR scenarios, the Wilga Street / Rothery Street roundabout will be required by the time 50% of the development is complete. The Wilga Street / Collins Street roundabout will be required when the development is 100% complete in both scenarios.
- A cycleway has been proposed to run along the northern and eastern perimeter of the Wilga Street Block, and there are opportunities for encouraging bicycle trips with end-of-trip facilities and the extension of off-road shared paths to nearby residential zones
- The Wilga Street Block is located in close proximity to bus stops on both sides of Princes Highway, and within 950m of Corrimal Railway Station. Additional trips from the development are unlikely to have a significant impact on the capacity of these services, and measures should be implemented to encourage public transport usage.

Appendix A: Intersection Count Diagrams

P5843 Wilga Street Corrimal

Intersection Count Diagram - All Vehicles

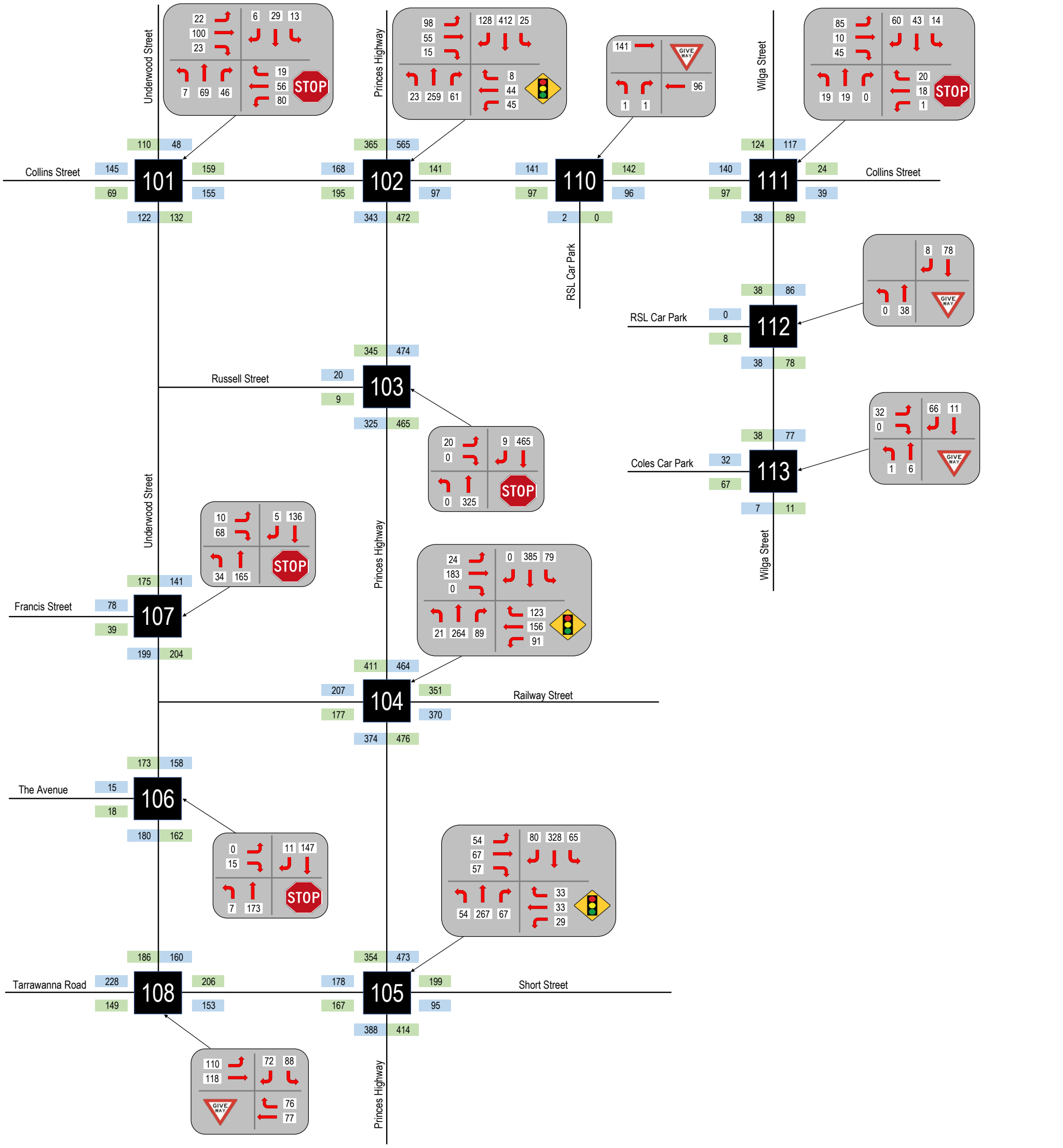
2022 Base 0700-0800



P5843 Wilga Street Corrimal

Intersection Count Diagram - All Vehicles

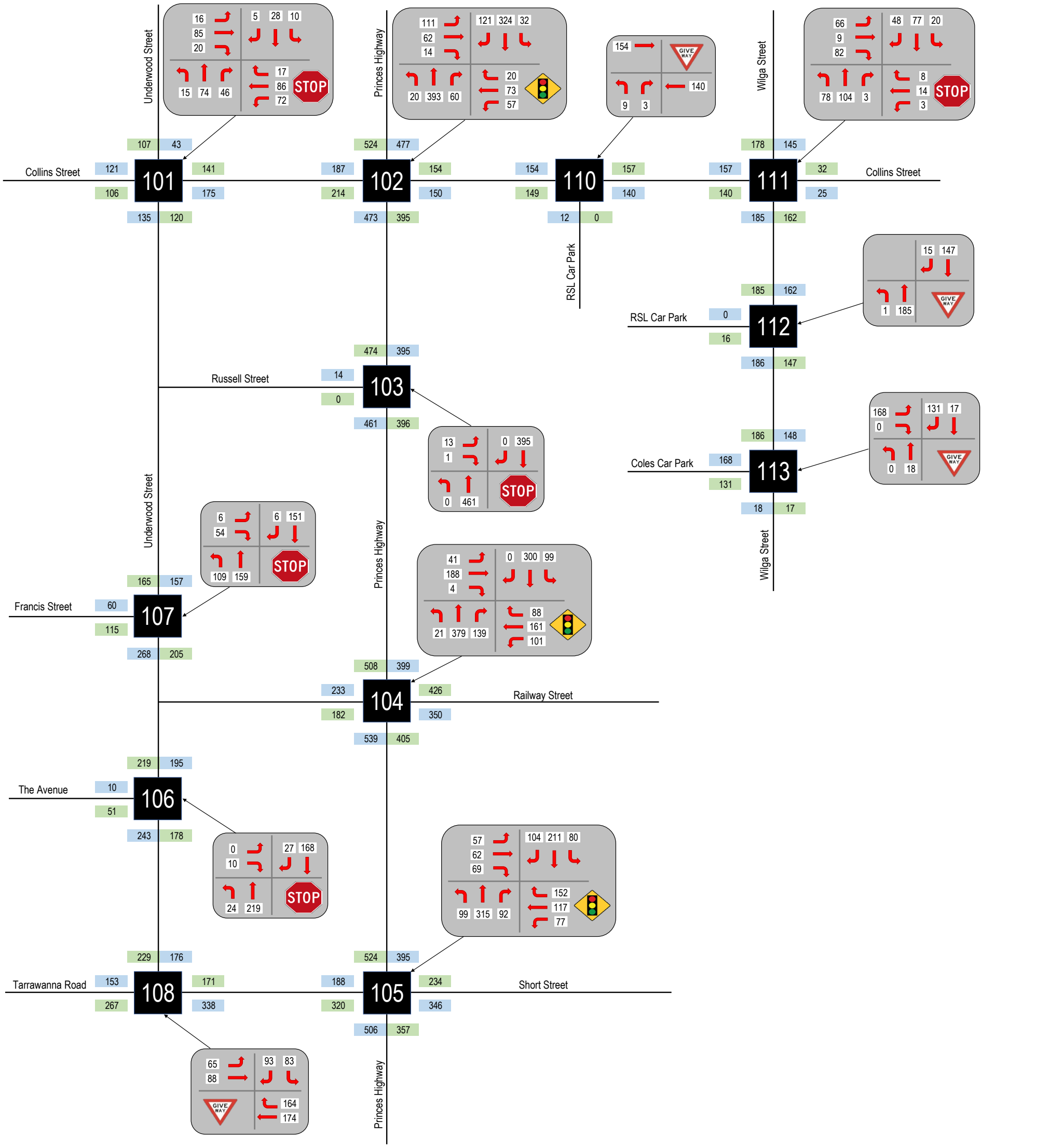
2022 Base 0800-0900



P5843 Wilga Street Corrimal

Intersection Count Diagram - All Vehicles

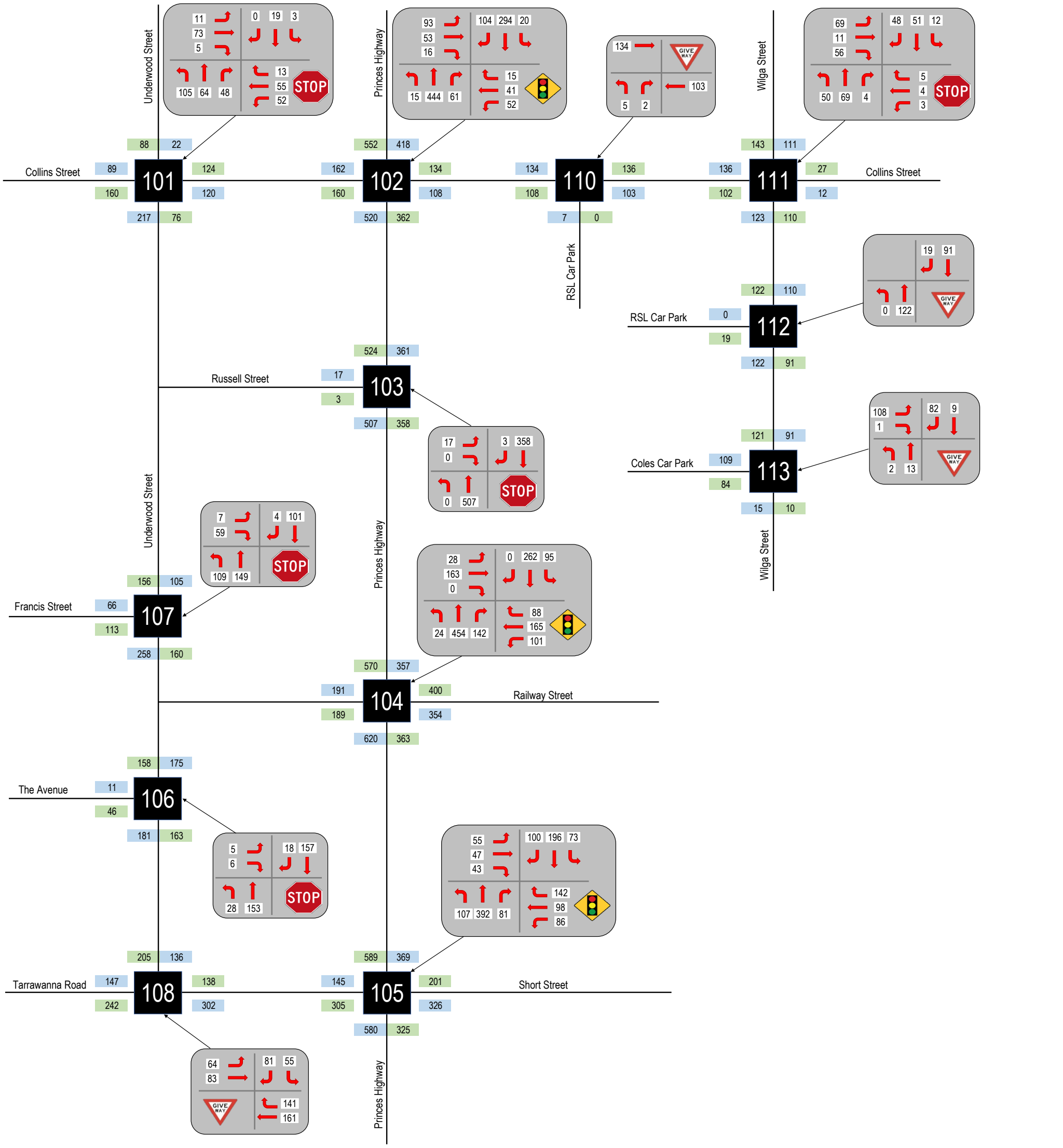
2022 Base 1600-1700



P5843 Wilga Street Corrimal

Intersection Count Diagram - All Vehicles

2022 Base 1700-1800



Appendix B: Network Performance Results – Aimsun

P5843 Wilga Street Block Corrimal

AIMSUN Network Statistics

AM Peak							
Measure	**2022 Base**	**2036 Do Min**	**2036 Upgraded Do Min**	**2036 Scenario A**	**2036 Scenario B**	**2036 Scenario A + Roundabout**	**2036 Scenario B + Roundabout**
Total Travel Time (hr)	160	209	200	232	238	232	236
Total Distance (km)	4,500	5,316	5,311	5,860	5,956	5,836	5,939
Total Delay (hr)	125	149	143	163	167	159	162
Average Speed (km/hr)	28.1	25.4	26.6	25.3	25.0	25.2	25.2
Average Travel Time (min)	1.47	1.66	1.59	1.64	1.64	1.64	1.63
Average Distance (km)	0.69	0.70	0.70	0.69	0.69	0.69	0.68
Average Delay (s)	69	71	68	69	69	67	67
Unreleased Trips	0	0	0	0	0	0	0
Completed Trips	6,493	7,490	7,492	8,425	8,595	8,426	8,600
Incomplete Trips	39	76	74	72	75	71	70
Total Number of Vehicles	6,532	7,567	7,568	8,507	8,689	8,501	8,676

PM Peak							
Measure	**2022 Base**	**2036 Do Min**	**2036 Upgraded Do Min**	**2036 Scenario A**	**2036 Scenario B**	**2036 Scenario A + Roundabout**	**2036 Scenario B + Roundabout**
Total Travel Time (hr)	239	330	233	321	335	322	323
Total Distance (km)	6,057	6,733	6,075	7,515	7,652	7,583	7,645
Total Delay (hr)	167	247	165	244	257	217	219
Average Speed (km/hr)	25.3	20.4	26.1	23.4	22.8	23.5	23.7
Average Travel Time (min)	1.62	2.04	1.56	1.73	1.78	1.73	1.72
Average Distance (km)	0.68	0.70	0.68	0.68	0.68	0.68	0.68
Average Delay (s)	68	92	66	79	82	70	70
Unreleased Trips	0	76	817	0	0	0	0
Completed Trips	8,786	9,580	8,711	11,003	11,203	11,106	11,205
Incomplete Trips	61	103	232	88	78	79	76
Total Number of Vehicles	8,858	9,760	9,797	11,111	11,298	11,192	11,292

Appendix C: Intersection Performance Results – Aimsun

P5843 Wilga Street Corrimal

Intersection Count Comparison - All Vehicles

AM Peak 0800-0900

					Volume (veh/h)								Delay (s)							LOS							Max Queue (veh)						
Intersection	Movement Code	From	To	Turn	2022 Survey	2022 Base	2036 Do Min	2036 Upgraded Do Min	2036 Scenario A	2036 Scenario B	2036 Scenario A + Round	2036 Scenario B + Round	2022 Base	2036 Do Min	2036 Upgraded Do Min	2036 Scenario A	2036 Scenario B	2036 Scenario A + Round	2036 Scenario B + Round	2022 Base	2036 Do Min	2036 Upgraded Do Min	2036 Scenario A	2036 Scenario B	2036 Scenario A + Round	2036 Scenario B + Round	2022 Base	2036 Do Min	2036 Upgraded Do Min	2036 Scenario A	2036 Scenario B	2036 Scenario A + Round	2036 Scenario B + Round
Underwood Street	101-1	Underwood Street (N)	Collins Street (W)	R	6	6	4	4	4	4	4	4	16.9	10.0	10.8	11.6	11.4	12.4	13.1	B	A	A	A	A	A	A	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Collins Street	101-2		Underwood Street (S)	T	29	34	45	45	42	45	43	43	11.0	12.1	12.5	14.9	14.6	14.6	14.8	A	A	A	B	B	B	B	2.0	2.0	2.0	2.2	3.0	2.0	2.6
	101-3		Collins Street (E)	L	13	4	5	5	14	13	13	15	9.8	11.0	10.9	11.6	10.5	10.9	10.2	A	A	A	A	A	A	A	1.0	1.0	1.0	1.2	1.2	1.0	1.0
	101-4	Collins Street (E)	Underwood Street (N)	R	19	15	19	19	29	32	31	33	3.4	7.0	6.6	5.8	6.1	5.7	6.4	A	A	A	A	A	A	A	1.0	1.6	1.4	1.6	1.6	1.6	1.8
	101-5		Collins Street (W)	T	56	46	68	68	87	100	88	101	1.0	1.5	1.7	1.8	1.9	1.8	2.1	A	A	A	A	A	A	A	0.0	0.2	0.0	0.8	1.4	0.8	2.0
	101-6		Underwood Street (S)	L	80	130	129	133	174	167	171	170	2.7	2.9	3.1	3.2	3.3	3.3	3.6	A	A	A	A	A	A	A	2.0	0.8	1.4	1.6	2.0	2.0	3.0
	101-7	Underwood Street (S)	Collins Street (E)	R	46	73	106	84	147	137	125	147	11.3	16.2	15.0	17.5	18.7	18.0	21.3	A	B	B	B	B	B	B	2.0	4.2	3.2	4.6	4.4	4.4	5.2
	101-8		Underwood Street (N)	T	69	88	110	109	113	114	110	114	10.8	15.2	14.3	18.7	19.8	18.5	21.4	A	B	A	B	B	B	B	2.0	3.8	3.6	4.0	4.4	4.2	4.2
	101-9		Collins Street (W)	L	7	2	6	7	3	3	3	3	7.4	11.0	12.6	20.4	23.3	18.5	23.7	A	A	A	B	B	B	B	1.0	1.2	1.2	1.2	0.8	1.0	0.8
	101-10	Collins Street (W)	Underwood Street (S)	R	23	24	30	32	33	32	36	33	3.4	3.5	3.2	4.6	4.5	4.9	3.4	A	A	A	A	A	A	A	1.0	1.6	1.2	1.6	1.6	1.6	1.4
	101-11		Collins Street (E)	T	100	105	110	108	122	123	120	121	0.2	0.4	0.4	0.4	0.6	0.5	0.6	A	A	A	A	A	A	A	0.0	1.2	0.8	0.8	1.0	1.2	1.2
	101-12		Underwood Street (N)	L	22	42	36	36	40	39	40	39	1.5	1.6	1.3	1.7	1.6	2.0	1.3	A	A	A	A	A	A	A	1.0	0.8	0.2	0.6	0.6	0.8	0.4
		All			470	569	669	652	809	810	784	823	16.9	16.2	15.0	20.4	23.3	18.5	23.7	B	B	B	B	B	B	B	2.0	4.2	3.6	4.6	4.4	4.4	5.2
Princes Highway	102-1	Princes Highway (N)	Collins Street (W)	R	128	114	140	146	157	150	155	156	60.4	76.0	62.7	55.4	51.2	55.3	55.7	E	F	E	D	D	D	D	6.0	8.0	9.4	8.6	7.6	8.4	8.8
Collins Street	102-2		Princes Highway (S)	T	412	452	523	520	506	511	506	505	17.9	21.0	20.1	20.5	19.9	20.8	20.5	B	B	B	B	B	B	B	10.0	10.8	10.6	11.6	11.2	11.6	10.8
	102-3		Collins Street (E)	L	25	21	27	27	35	37	35	37	22.7	24.4	22.8	22.4	23.2	22.1	24.1	B	B	B	B	B	B	B	2.0	2.0	2.4	2.4	2.2	2.4	2.2
	102-4	Collins Street (E)	Princes Highway (N)	R	8	7	11	10	21	26	21	22	61.0	51.4	41.4	92.3	81.7	109.5	149.2	E	D	C	F	F	F	F	2.0	1.8	2.0	2.8	2.0	3.0	3.2
	102-5		Collins Street (W)	T	44	46	46	44	99	116	98	114	38.4	33.1	32.1	44.5	54.7	49.7	77.7	C	C	C	D	D	D	F	3.0	3.4	3.0	6.4	10.2	6.4	8.2
	102-6		Princes Highway (S)	L	45	50	47	49	93	106	95	109	34.3	30.6	31.2	43.7	57.0	48.4	81.9	C	C	C	D	E	D	F	6.0	3.2	3.4	5.4	7.6	6.2	8.6
	102-7	Princes Highway (S)	Collins Street (E)	R	61	65	85	101	94	93	98	86	48.4	73.2	58.8	80.4	79.2	98.5	74.2	D	F	E	F	F	F	F	4.0	6.4	6.8	7.4	6.8	7.2	7.6
	102-8		Princes Highway (N)	T	259	316	303	312	293	297	295	289	12.7	21.3	22.6	30.4	29.9	37.9	27.3	A	B	B	C	C	C	B	6.0	10.4	10.2	9.2	10.6	10.6	11.0
	102-9		Collins Street (W)	L	23	11	12	13	7	8	11	10	20.9	21.9	27.0	28.0	32.1	46.4	29.9	B	B	B	B	C	D	C	2.0	1.2	1.6	1.2	1.2	1.4	1.0
	102-10	Collins Street (W)	Princes Highway (S)	R	15	13	14	16	17	17	5	6	41.9	49.9	51.3	64.9	77.1	108.6	158.3	C	D	D	E	F	F	F	1.0	2.2	2.0	1.4	1.6	1.0	1.6
	102-11		Collins Street (E)	T	55	65	89	74	144	143	137	152	41.2	37.4	41.1	49.3	43.8	45.0	52.5	C	C	C	D	D	D	D	8.0	7.4	8.6	13.6	13.8	7.4	8.4
	102-12		Princes Highway (N)	L	98	81	85	79	86	81	81	94	32.1	29.6	31.0	39.0	36.3	38.8	42.4	C	C	C	C	C	C	C	4.0	6.4	5.2	6.8	5.4	4.6	5.6
		All			1,173	1,241	1,381	1,392	1,552	1,585	1,538	1,579	26.3	32.8	31.1	37.7	38.0	40.9	43.4	B	C	C	C	C	C	D	10.0	10.8	10.6	13.6	13.8	11.6	11.0
Princes Highway	103-2	Princes Highway (N)	Princes Highway (S)	T	465	517	585	582	613	630	604	617	3.3	6.2	5.8	6.2	6.6	6.5	6.3	A	A	A	A	A	A	A	6.0	10.4	11.4	11.0	13.2	11.2	11.4
Russell Street	103-8	Princes Highway (S)	Princes Highway (N)	T	325	374	377	401	364	359	362	357	0.2	2.1	0.6	3.5	2.7	7.2	1.9	A	A	A	A	A	A	A	0.0	2.6	2.0	3.4	3.2	3.4	4.6
	103-9		Russell Street (W)	L	0	2	21	22	13	22	9	20	0.0	2.1	0.4	2.1	0.8	3.4	0.4	A	A	A	A	A	A	A	0.0	0.4	0.4	0.2	0.2	0.4	0.2
	103-12	Russell Street (W)	Princes Highway (N)	L	20	20	24	27	32	46	46	30	7.5	22.4	8.4	15.3	16.5	33.1	17.6	A	B	A	B	B	C	B	1.0	1.8	1.6	2.0	3.2	3.2	2.4
		All			810	913	1,007	1,033	1,023	1,058	1,021	1,024	7.5	22.4	8.4	15.3	16.5	33.1	17.6	A	B	A	B	B	C	B	6.0	10.4	11.4	11.0	13.2	11.2	11.4
Princes Highway	104-2	Princes Highway (N)	Princes Highway (S)	T	385	391	433	431	440	456	441	449	22.3	32.2	23.0	29.4	27.7	27.5	27.8	B	C	B	C	B	B	B	5.5	7.7	7.4	8.5	7.8	7.7	7.4
Railway Street	104-3		Railway Street (E)	L	79	120	149	150	168	170	160	164	24.7	37.0	27.1	32.6	31.0	31.3	32.2	B	C	B	C	C	C	C	4.0	7.6	6.2	8.2	8.6	7.6	8.2
	104-4	Railway Street (E)	Princes Highway (N)	R	123	126	123	133	98	91	88	97	57.5	78.7	70.6	65.3	81.6	74.4	84.6	E	F	F	E	F	F	F	7.0	11.0	9.6	8.2	7.8	9.2	9.6
	104-5		Railway Street (W)	T	156	182	179	167	197	194	194	197	30.2	34.5	31.8	30.7	33.8	31.9	34.3	C	C	C	C	C	C	C	3.5	4.2	3.8	4.0	4.2	4.1	4.7
	104-6		Princes Highway (S)	L	91	128	124	125	124	131	126	117	28.8	33.3	29.4	28.9	30.8	31.4	31.9	C	C	C	C	C	C	C	5.0	7.2	6.6	6.0	5.6	6.0	5.6
	104-7	Princes Highway (S)	Railway Street (E)	R	89	69	107	106	103	93	103	89	29.4	27.2	26.0	25.9	29.1	27.2	27.2	C	B	B	B	C	B	B	4.0	5.4	5.4	5.2	5.0	5.0	4.4
	104-8		Princes Highway (N)	T	264	305	320	333	330	339	333	328	11.2	9.8	9.2	9.5	9.5	9.5	9.2	A	A	A	A	A	A	A	3.5	3.6	3.4	3.9	3.5	3.8	3.4
	104-9		Railway Street (W)	L	21	17	39	34	26	32	27	27	15.6	18.1	17.0	17.0	19.0	18.1	19.8	B	B	B	B	B	B	B	1.0	2.6	2.4	2.4	2.4	2.8	2.0
	104-11	Railway Street (W)	Railway Street (E)	T	183	234	215	217	224	236	221	240	21.3	24.7	24.0	24.4	24.3	24.3	24.7	B	B	B	B	B	B	B	5.0	5.0	4.8	5.4	5.6	5.4	5.4
	104-12		Princes Highway (N)	L	24	37	37	38	43	43	43	43	23.6	25.6	31.3	24.3	21.7	24.4	24.0	B	B	C	B	B	B	B	3.0	2.8	3.4	3.2	3.0	3.2	3.0
		All			1,415	1,609	1,726	1,734	1,753	1,784	1,737	1,752	24.6	30.4	26.0	26.9	27.5	26.9	28.2	B	C	B	B	B	B	B	7.0	11.0	9.6	8.5	8.6	9.2	9.6
Princes Highway	105-1	Princes Highway (N)	Tarrawanna Road (W)	R	80	70	65	61	59	72	60	53	19.0	29.3	27.2	36.4	36.1	35.0	29.9	B	C	B	C	C	C	C	3.0	3.6	3.8	5.0	4.8	5.6	3.4
Short Street	105-2		Princes Highway (S)	T	328	369	402	404	415	426	419	424	4.3	8.9	7.4	9.3	10.2	8.0	7.2	A	A	A	A	A	A	A	2.5	5.0	4.3	4.8	5.2	4.9	4.0
Tarrawanna Road	105-3		Short Street (E)	L	65	83	89	89	84	88	86	90	9.9	16.1	14.8	15.2	17.0	15.3	14.5	A	B	B	B	B	B	A	2.0	4.6	4.0	3.8	3.8	3.6	3.6
	105-4	Short Street (E)	Princes Highway (N)	R	33	48	26	28	37	38	40	35	41.1	42.4	41.1	38.6	38.6	40.2	40.2	C	C	C	C	C	C	C	4.0	2.8	3.2	2.8	3.0	3.0	3.0
	105-5		Tarrawanna Road (W)	T	33	34	43	42	34	36	34	35	22.4	26.4	26.5	34.4	30.6	32.0	28.4	B	B	B	C	C	C	B	3.0	3.4	3.2	3.0	3.0	3.0	2.6
	105-6		Princes Highway (S)	L	29	34	37	37	34	37	34	38	33.1	35.1	35.3	37.8	39.2	38.2	40.1	C	C	C	C	C	C	C	3.0	3.0	3.0	3.0	3.0	3.0	2.8
	105-7	Princes Highway (S)	Short Street (E)	R	67	69	63	63	65	66	65	66	17.9	19.4	20.2	20.2	20.8	19.8	19.2	B	B	B	B	B	B	B	3.0	3.2	3.4	3.0	3.8	2.8	3.4
	105-8		Princes Highway (N)	T	267	308	380	380	369	381	369	367	11.3	10.7	10.7	10.3	10.7	10.3	10.4	A	A	A	A	A	A	A	3.5	4.1	4.2	4.4	4.1	4.4	4.2
	105-9		Tarrawanna Road (W)	L	54	50	58	58	78	67	78	81	12.9	12.3	11.8	13.7	14.4	14.1	12.9	A	A	A	A	A	A	A	2.0	2.8	2.8	3.6	3.4	3.8	3.8
	105-10	Tarrawanna Road (W)	Princes Highway (S)	R	57	71	72	71	86	82	83	83	29.5	38.0	37.9	39.3	40.7	37.9	38.6	C	C	C	C	C	C	C	3.0	2.8	3.2	3.0	3.0	3.4	3.0
	105-11		Short Street (E)	T	67	72	67	66	64	64	65	64	35.1	32.8	34.3	32.0	34.2	32.6	35.8	C	C	C	C	C	C	C	1.5	1.5	1.5	1.5	1.7	1.7	1.6
	105-12		Princes Highway (N)	L	54	40	59	63	53	44	54	41	22.2	32.7	30.5	32.8	31.6	32.1	31.7	B	C	C	C	C	C	C	2.0	2.4	2.4	2.8	2.2	2.8	2.0
		All			1,134	1,248	1,360	1,364	1,380	1,402	1,388	1,378	14.8	17.1	16.5	17.8	18.4	17.3	16.6	B	B	B	B	B	B	B	4.0	5.0	4.3	5.0	5.2	5.6	4.2

Intersection	Movement Code	From	To	Turn	Volume (veh/h) 2022 Survey	2022 Base	2036 Do Min	2036 Upgraded Do Min	2036 Scenario A	2036 Scenario B	2036 Scenario A + Round	2036 Scenario B + Round	Delay (s) 2022 Base	2036 Do Min	2036 Upgraded Do Min	2036 Scenario A	2036 Scenario B	2036 Scenario A + Round	2036 Scenario B + Round	LOS 2022 Base	2036 Do Min	2036 Upgraded Do Min	2036 Scenario A	2036 Scenario B	2036 Scenario A + Round	2036 Scenario B + Round	Max Queue (veh) 2022 Base	2036 Do Min	2036 Upgraded Do Min	2036 Scenario A	2036 Scenario B	2036 Scenario A + Round	2036 Scenario B + Round
Underwood Street	106-1	Underwood Street (N)	The Avenue (W)	R	11	8	7	7	20	23	20	23	1.7	2.8	3.9	3.0	3.0	2.3	2.7	A	A	A	A	A	A	A	1.0	0.8	0.8	1.4	1.2	1.4	1.2
The Avenue	106-2		Underwood Street (S)	T	147	192	189	189	223	206	219	223	0.5	0.4	0.4	0.4	0.4	0.4	0.4	A	A	A	A	A	A	A	0.0	0.4	0.6	1.4	1.0	0.6	0.8
	106-8	Underwood Street (S)	Underwood Street (N)	T	173	230	239	233	280	283	274	296	1.4	1.3	1.3	1.4	1.4	1.4	1.3	A	A	A	A	A	A	A	0.0	0.0	0.0	0.0	0.2	0.0	0.2
	106-9		The Avenue (W)	L	7	9	19	18	17	18	17	18	1.6	2.2	2.1	2.5	2.4	2.5	2.4	A	A	A	A	A	A	A	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	106-10	The Avenue (W)	Underwood Street (S)	R	15	14	21	21	24	22	24	22	12.2	12.7	12.8	14.0	13.4	13.4	13.5	A	A	A	A	A	A	A	1.0	2.0	1.8	1.8	1.6	1.6	1.6
	106-12		Underwood Street (N)	L	0	14	12	12	22	23	22	24	10.7	9.4	9.3	10.5	11.0	10.4	11.1	A	A	A	A	A	A	A	2.0	1.2	1.2	2.0	1.6	2.2	1.6
		All			353	467	487	481	587	576	576	607	12.2	12.7	12.8	14.0	13.4	13.4	13.5	A	A	A	A	A	A	A	2.0	2.0	1.8	2.0	1.6	2.2	1.6
Underwood Street	107-1	Underwood Street (N)	Francis Street (W)	R	5	15	14	15	13	13	13	14	0.5	1.2	2.1	2.6	2.4	2.4	2.7	A	A	A	A	A	A	A	1.0	1.0	0.8	1.0	1.0	1.0	1.0
Francis Street	107-2		Underwood Street (S)	T	136	181	186	188	231	226	229	228	0.2	0.2	0.2	0.2	0.2	0.2	0.2	A	A	A	A	A	A	A	0.0	0.0	0.4	0.2	0.2	0.4	0.2
	107-8	Underwood Street (S)	Underwood Street (N)	T	165	201	247	222	299	294	292	290	0.4	0.4	0.4	0.4	0.5	0.4	0.4	A	A	A	A	A	A	A	0.0	0.2	0.2	0.4	0.4	0.4	0.4
	107-9		Francis Street (W)	L	34	44	60	59	58	60	57	59	0.2	0.3	0.3	0.1	0.3	0.2	0.2	A	A	A	A	A	A	A	0.0	0.0	0.2	0.0	0.0	0.2	0.2
	107-10	Francis Street (W)	Underwood Street (S)	R	68	80	77	77	93	94	92	94	9.7	10.9	10.7	12.4	12.3	12.2	11.8	A	A	A	A	A	A	A	2.0	2.4	2.6	3.0	3.0	2.8	2.8
	107-12		Underwood Street (N)	L	10	6	8	8	6	6	6	7	8.9	9.3	9.9	9.7	10.2	10.9	9.8	A	A	A	A	A	A	A	1.0	1.0	1.0	1.0	1.0	1.0	1.0
		All			418	527	592	569	700	693	690	691	9.7	10.9	10.7	12.4	12.3	12.2	11.8	A	A	A	A	A	A	A	2.0	2.4	2.6	3.0	3.0	2.8	2.8
Underwood Street	108-1	Underwood Street (N)	Tarrawanna Road (W)	R	72	77	75	75	84	81	84	84	4.1	9.3	6.0	10.1	5.5	8.0	5.7	A	A	A	A	A	A	A	3.0	2.4	2.6	3.6	3.0	3.4	2.8
Tarrawanna Road	108-3		Tarrawanna Road (E)	L	88	128	132	133	163	146	157	160	3.2	10.6	6.4	9.8	3.8	8.8	4.4	A	A	A	A	A	A	A	2.0	6.2	4.0	4.6	2.2	5.6	3.4
	108-4	Tarrawanna Road (E)	Underwood Street (N)	R	76	112	121	116	146	150	140	163	2.4	2.8	2.8	2.8	3.0	3.0	2.9	A	A	A	A	A	A	A	1.0	1.4	1.4	1.6	1.8	1.6	1.6
	108-5		Tarrawanna Road (W)	T	77	67	67	67	56	60	57	58	0.5	0.5	0.4	0.6	0.5	0.5	0.6	A	A	A	A	A	A	A	1.0	0.4	0.4	0.6	0.6	0.4	0.4
	108-11	Tarrawanna Road (W)	Underwood Street (N)	T	118	113	122	122	118	117	118	118	0.4	4.3	3.2	4.0	0.9	3.5	1.1	A	A	A	A	A	A	A	1.0	3.0	2.8	3.0	1.0	2.2	1.4
	108-12		Tarrawanna Road (E)	L	110	127	136	136	152	152	151	151	1.9	3.6	3.5	3.5	2.1	3.2	2.2	A	A	A	A	A	A	A	0.0	2.2	2.2	1.6	0.2	1.4	0.4
		All			541	624	653	648	719	707	708	734	4.1	10.6	6.4	10.1	5.5	8.8	5.7	A	A	A	A	A	A	A	3.0	6.2	4.0	4.6	3.0	5.6	3.4
RSL Car Park	110-5	Collins Street (E)	Collins Street (W)	T	96	103	104	104	214	247	214	248	1.0	1.0	1.0	1.2	1.3	1.3	4.1	A	A	A	A	A	A	A	0.0	0.0	0.0	0.0	0.4	0.0	1.4
Collins Street	110-7	RSL Car Park (S)	Collins Street (E)	R	1	1	3	3	2	4	2	4	16.8	3.1	2.3	5.4	6.7	3.5	38.5	B	A	A	A	A	A	C	1.0	0.4	0.4	0.6	0.6	0.4	1.0
	110-9		Collins Street (W)	L	1	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	A	A	A	A	A	A	A	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	110-11	Collins Street (W)	Collins Street (E)	T	141	151	201	203	273	273	270	274	1.1	1.1	1.2	1.2	1.2	1.3	1.4	A	A	A	A	A	A	A	0.0	0.0	0.0	0.2	0.0	1.0	1.0
		All			239	255	308	310	489	524	486	526	16.8	3.1	2.3	5.4	6.7	3.5	38.5	B	A	A	A	A	A	C	1.0	0.4	0.4	0.6	0.6	1.0	1.4
Wilga Street	111-1	Wilga Street (N)	Collins Street (W)	R	60	60	59	59	67	71	67	71	8.7	9.7	9.4	14.1	17.1	5.2	6.2	A	A	A	A	B	A	A	2.0	2.2	2.2	2.6	2.8	2.2	2.4
Collins Street	111-2		Wilga Street (S)	T	43	46	45	46	117	110	117	110	9.3	11.4	11.3	14.9	16.5	5.1	5.8	A	A	A	B	B	A	A	2.0	2.0	2.0	3.2	3.8	2.6	2.8
	111-3		Collins Street (E)	L	14	13	13	13	12	12	12	12	8.0	8.9	9.5	12.0	14.4	5.5	6.4	A	A	A	A	A	A	A	1.0	1.4	1.4	1.2	1.2	1.0	1.4
	111-4	Collins Street (E)	Wilga Street (N)	R	20	20	19	19	20	20	20	20	2.1	2.9	3.2	2.8	4.0	7.1	8.0	A	A	A	A	A	A	A	1.0	1.0	1.0	0.8	1.2	1.6	1.6
	111-5		Collins Street (W)	T	18	22	26	26	27	26	27	26	0.0	0.2	0.1	0.0	0.4	7.5	9.4	A	A	A	A	A	A	A	0.0	0.2	0.0	0.0	0.4	1.8	1.4
	111-6		Wilga Street (S)	L	1	3	1	1	0	0	0	0	1.7	1.5	1.5	1.4	1.4	3.4	1.7	A	A	A	A	A	A	A	0.0	0.0	0.0	0.0	0.0	0.2	0.0
	111-7	Wilga Street (S)	Collins Street (E)	R	0	0	1	1	0	0	0	0	0.0	9.6	21.9	0.0	0.0	0.0	0.0	A	A	B	A	A	A	A	0.0	0.6	0.6	0.0	0.0	0.0	0.0
	111-8		Wilga Street (N)	T	19	18	21	21	107	128	107	129	8.7	10.9	10.9	16.3	21.5	4.6	5.5	A	A	A	B	B	A	A	1.0	1.4	1.4	3.0	4.4	2.8	3.2
	111-9		Collins Street (W)	L	19	21	19	19	121	150	121	150	9.2	8.4	8.3	13.3	17.6	4.1	5.1	A	A	A	A	B	A	A	2.0	1.4	1.4	3.2	4.4	2.4	3.4
	111-10	Collins Street (W)	Wilga Street (S)	R	45	45	48	49	123	122	121	123	1.0	1.3	1.4	1.9	2.2	3.2	3.8	A	A	A	A	A	A	A	1.0	1.2	1.2	2.0	2.4	3.2	3.2
	111-11		Collins Street (E)	T	10	19	42	43	39	40	39	41	0.6	0.8	0.7	1.0	1.1	3.6	4.2	A	A	A	A	A	A	A	0.0	0.2	0.2	0.2	0.6	1.6	1.6
	111-12		Wilga Street (N)	L	85	88	113	115	113	115	112	114	0.6	0.9	1.0	1.4	1.4	3.8	4.7	A	A	A	A	A	A	A	0.0	0.6	0.6	0.8	1.2	3.4	3.6
		All			334	355	408	410	744	795	742	798	9.3	11.4	11.3	16.3	21.5	7.5	9.4	A	A	A	B	B	A	A	2.0	2.2	2.2	3.2	4.4	3.4	3.6
Wilga Street	112-1	Wilga Street (N)	RSL Car Park (W)	R	8	8	7	7	9	8	9	7	4.1	2.8	2.6	3.6	4.0	4.0	4.5	A	A	A	A	A	A	A	1.0	0.2	0.0	0.8	0.8	0.8	0.6
RSL Car Park	112-2		Wilga Street (S)	T	78	86	87	88	231	225	230	226	1.0	1.0	1.0	1.1	1.0	1.4	1.4	A	A	A	A	A	A	A	0.0	0.0	0.0	0.0	0.0	0.4	0.4
	112-8	Wilga Street (S)	Wilga Street (N)	T	38	40	42	42	227	281	227	281	0.7	0.7	0.7	0.8	1.6	0.8	0.9	A	A	A	A	A	A	A	0.0	0.0	0.0	0.0	2.4	0.0	0.6
	112-9		RSL Car Park (W)	L	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	A	A	A	A	A	A	A	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		All			124	134	136	137	467	513	466	514	4.1	2.8	2.6	3.6	4.0	4.0	4.5	A	A	A	A	A	A	A	1.0	0.2	0.0	0.8	2.4	0.8	0.6
Wilga Street	113-1	Wilga Street (N)	Coles Car Park (W)	R	66	78	76	77	220	213	220	214	0.2	0.2	0.2	0.3	0.3	0.3	0.3	A	A	A	A	A	A	A	0.0	0.2	0.4	1.0	0.6	0.8	0.8
Coles Car Park	113-2		Wilga Street (S)	T	11	8	10	10	10	11	10	11	0.0	0.1	0.1	0.2	0.2	0.4	0.2	A	A	A	A	A	A	A	0.0	0.0	0.0	0.0	0.0	0.2	0.0
	113-8	Wilga Street (S)	Wilga Street (N)	T	6	5	7	7	6	4	6	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	A	A	A	A	A	A	A	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	113-9		Coles Car Park (W)	L	1	1	0	0	1	1	1	1	1.2	1.2	1.2	1.3	1.2	1.3	1.2	A	A	A	A	A	A	A	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	113-10	Coles Car Park (W)	Wilga Street (S)	R	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	A	A	A	A	A	A	A	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	113-12		Wilga Street (N)	L	32	34	35	35	222	277	222	277	0.4	0.3	0.3	0.6	1.1	0.6	0.7	A	A	A	A	A	A	A	0.0	0.0	0.0	0.8	1.8	0.8	1.0
		All			116	126	129	130	459	506	458	507	1.2	1.2	1.2	1.3	1.2	1.3	1.2	A	A	A	A	A	A	A	0.0	0.2	0.4	1.0	1.8	0.8	1.0

P5843 Wilga Street Corrimal

Intersection Count Comparison - All Vehicles

PM Peak 1600-1700

Intersection	Movement Code	From	To	Turn	Volume (veh/h)								Delay (s)							LOS							Max Queue (veh)						
					2022 Survey	2022 Base	2036 Do Min	2036 Upgraded Do Min	2036 Scenario A	2036 Scenario B	2036 Scenario A + Round	2036 Scenario B + Round	2022 Base	2036 Do Min	2036 Upgraded Do Min	2036 Scenario A	2036 Scenario B	2036 Scenario A + Round	2036 Scenario B + Round	2022 Base	2036 Do Min	2036 Upgraded Do Min	2036 Scenario A	2036 Scenario B	2036 Scenario A + Round	2036 Scenario B + Round	2022 Base	2036 Do Min	2036 Upgraded Do Min	2036 Scenario A	2036 Scenario B	2036 Scenario A + Round	2036 Scenario B + Round
Underwood Street	101-1	Underwood Street (N)	Collins Street (W)	R	5	4	8	8	9	8	10	8	13.8	12.7	11.5	17.2	19.8	14.7	17.9	A	A	A	B	B	B	B	1.0	1.0	1.0	1.6	1.6	1.5	1.6
Collins Street	101-2		Underwood Street (S)	T	28	32	41	44	41	49	51	50	11.3	12.1	12.4	13.4	13.5	14.0	13.7	A	A	A	A	A	A	A	2.0	2.0	2.2	2.0	2.6	2.3	2.2
	101-3		Collins Street (E)	L	10	7	11	8	20	20	20	19	9.2	11.4	12.0	9.8	10.0	10.7	11.8	A	A	A	A	A	A	A	1.0	1.4	1.4	1.2	1.2	1.3	1.2
	101-4	Collins Street (E)	Underwood Street (N)	R	17	12	10	9	22	26	26	25	3.9	5.1	3.6	4.6	4.9	4.3	4.3	A	A	A	A	A	A	A	1.0	1.0	0.6	1.2	1.4	1.5	1.2
	101-5		Collins Street (W)	T	86	96	101	121	155	151	153	153	1.0	0.9	1.2	1.5	1.9	1.6	1.5	A	A	A	A	A	A	A	1.0	0.2	0.2	1.2	2.6	1.0	0.8
	101-6		Underwood Street (S)	L	72	66	64	96	102	104	108	108	2.5	2.6	2.8	2.9	3.1	2.9	3.0	A	A	A	A	A	A	A	0.0	0.2	0.0	0.6	1.6	1.3	1.4
	101-7	Underwood Street (S)	Collins Street (E)	R	46	72	98	89	94	90	96	86	15.2	16.0	16.6	24.2	19.7	23.7	19.7	B	B	B	B	B	B	B	3.0	3.8	3.2	5.6	3.8	5.8	3.2
	101-8		Underwood Street (N)	T	74	103	115	116	111	113	107	113	15.4	15.4	16.0	20.2	19.6	21.1	19.6	B	B	B	B	B	B	B	3.0	3.2	4.0	4.4	3.8	4.5	4.6
	101-9		Collins Street (W)	L	15	36	29	28	33	42	37	42	14.0	14.1	13.9	20.2	16.5	18.7	16.6	A	A	A	B	B	B	B	3.0	1.8	1.8	2.4	2.2	2.3	2.2
	101-10	Collins Street (W)	Underwood Street (S)	R	20	12	30	29	35	31	31	31	1.1	2.4	3.0	3.7	3.3	5.0	4.5	A	A	A	A	A	A	A	1.0	1.0	1.0	1.2	1.2	1.3	1.4
	101-11		Collins Street (E)	T	85	111	74	73	102	110	109	110	0.0	0.3	0.2	0.7	0.4	0.7	0.7	A	A	A	A	A	A	A	0.0	0.8	0.2	2.0	0.8	2.0	1.0
	101-12		Underwood Street (N)	L	16	20	22	22	23	21	25	21	1.3	1.2	1.4	1.4	1.3	1.3	1.6	A	A	A	A	A	A	A	0.0	0.0	0.2	0.4	0.4	0.3	0.6
		All			474	571	603	643	746	765	771	766	15.4	16.0	16.6	24.2	19.8	23.7	19.7	B	B	B	B	B	B	B	3.0	3.8	4.0	5.6	3.8	5.8	4.6
Princes Highway	102-1	Princes Highway (N)	Collins Street (W)	R	121	109	110	163	152	152	157	153	132.5	164.0	61.4	66.4	74.6	78.9	76.3	F	F	E	E	F	F	F	9.0	9.0	9.8	9.4	9.8	9.5	9.8
Collins Street	102-2		Princes Highway (S)	T	324	344	297	377	380	377	379	377	25.7	39.5	16.8	19.6	19.8	20.3	20.3	B	C	B	B	B	B	B	10.0	9.8	10.0	9.2	9.0	9.3	9.4
	102-3		Collins Street (E)	L	32	51	35	50	70	78	72	78	33.0	39.9	19.2	23.5	21.9	23.2	22.9	C	C	B	B	B	B	B	2.0	2.6	3.0	3.6	3.4	3.5	3.4
	102-4	Collins Street (E)	Princes Highway (N)	R	20	22	31	31	43	43	38	42	35.4	39.2	56.7	96.6	99.7	139.7	154.9	C	C	E	F	F	F	F	2.0	3.2	3.2	4.2	4.2	5.5	5.6
	102-5		Collins Street (W)	T	73	80	73	75	137	138	138	143	33.2	30.2	36.2	51.0	62.0	69.5	98.6	C	C	C	D	E	E	F	5.0	3.4	4.6	8.8	8.4	9.8	10.2
	102-6		Princes Highway (S)	L	57	51	56	54	84	94	88	96	27.9	27.2	37.5	49.6	58.2	68.3	98.5	B	B	C	D	E	E	F	5.0	3.2	4.0	6.0	6.4	7.5	7.4
	102-7	Princes Highway (S)	Collins Street (E)	R	60	53	68	79	130	146	143	150	55.7	68.7	59.8	50.1	60.4	63.4	55.8	D	E	E	D	E	E	D	3.0	5.8	4.8	6.2	7.4	7.5	7.0
	102-8		Princes Highway (N)	T	393	444	464	442	434	449	440	445	14.3	18.0	25.8	22.0	25.9	27.9	23.7	A	B	B	B	B	B	B	13.0	12.8	13.0	12.4	13.4	12.8	13.0
	102-9		Collins Street (W)	L	20	13	17	10	15	16	15	11	25.8	24.3	22.6	22.4	26.7	31.7	25.6	B	B	B	B	B	C	B	1.0	1.8	1.2	1.6	1.8	1.8	1.4
	102-10	Collins Street (W)	Princes Highway (S)	R	14	23	20	16	16	19	10	11	44.1	43.6	66.3	96.3	121.9	212.3	303.6	D	D	E	F	F	F	F	2.0	2.2	1.6	2.2	2.8	2.8	2.8
	102-11		Collins Street (E)	T	62	72	87	72	114	119	119	115	36.5	36.3	42.2	50.4	47.7	49.3	51.6	C	C	C	D	D	D	D	5.0	6.4	7.2	9.6	10.2	7.0	6.2
	102-12		Princes Highway (N)	L	111	101	76	78	84	82	88	85	29.2	28.7	30.1	37.9	38.5	41.3	41.4	C	C	C	C	C	C	C	6.0	5.2	4.8	4.8	5.0	4.8	4.6
		All			1,287	1,363	1,335	1,447	1,659	1,714	1,685	1,706	33.8	41.8	32.2	37.0	41.4	45.1	48.7	C	C	C	C	C	D	D	13.0	12.8	13.0	12.4	13.4	12.8	13.0
Princes Highway	103-2	Princes Highway (N)	Princes Highway (S)	T	395	418	373	442	480	491	477	484	5.2	6.3	6.0	6.8	6.0	6.1	6.0	A	A	A	A	A	A	A	12.0	10.2	11.0	8.8	10.0	8.5	9.8
Russell Street	103-8	Princes Highway (S)	Princes Highway (N)	T	461	471	515	487	531	551	546	547	0.7	2.3	2.1	2.4	4.5	5.0	4.0	A	A	A	A	A	A	A	5.0	5.8	4.2	5.6	6.0	5.8	5.0
	103-9		Russell Street (W)	L	0	3	9	8	8	5	5	6	0.0	1.3	1.7	2.6	0.7	2.4	3.8	A	A	A	A	A	A	A	0.0	0.2	0.2	0.6	0.0	0.3	0.2
	103-12	Russell Street (W)	Princes Highway (N)	L	13	42	36	48	49	58	53	61	9.6	22.4	20.1	18.8	48.0	55.0	43.9	A	B	B	B	D	D	D	2.0	2.6	3.2	3.0	2.8	3.3	3.0
		All			869	934	932	985	1,068	1,105	1,080	1,098	9.6	22.4	20.1	18.8	48.0	55.0	43.9	A	B	B	B	D	D	D	12.0	10.2	11.0	8.8	10.0	8.5	9.8
Princes Highway	104-2	Princes Highway (N)	Princes Highway (S)	T	300	317	243	281	311	309	306	310	29.5	29.4	20.5	33.4	34.9	37.1	35.1	C	C	B	C	C	C	C	9.5	6.3	5.2	6.0	7.0	6.3	6.1
Railway Street	104-3		Railway Street (E)	L	99	102	130	155	167	175	164	168	28.8	35.4	25.4	37.9	39.0	43.1	40.7	C	C	B	C	C	D	C	6.0	8.8	7.8	7.4	9.6	9.5	8.8
	104-4	Railway Street (E)	Princes Highway (N)	R	88	98	124	123	117	117	102	123	42.2	56.1	57.4	56.4	68.5	75.0	74.2	C	D	E	D	E	F	F	6.0	7.8	8.0	8.0	8.2	8.0	8.8
	104-5		Railway Street (W)	T	161	212	192	199	204	208	221	203	26.0	27.6	28.4	30.3	28.8	28.1	29.8	B	B	B	C	C	B	C	4.0	3.6	4.2	5.1	4.1	5.1	3.8
	104-6		Princes Highway (S)	L	101	75	119	108	95	111	99	108	23.6	29.4	27.6	27.2	32.2	29.2	33.4	B	C	B	B	C	C	C	6.0	5.8	6.4	5.2	6.0	6.0	6.4
	104-7	Princes Highway (S)	Railway Street (E)	R	139	119	118	98	122	121	117	112	25.0	25.0	30.4	33.5	33.3	30.4	33.8	B	B	C	C	C	C	C	6.0	6.2	5.4	7.2	6.8	6.3	6.6
	104-8		Princes Highway (N)	T	379	376	408	380	423	445	457	438	13.3	12.2	12.3	16.3	14.4	14.4	14.4	A	A	A	B	A	A	A	4.5	5.1	4.4	5.6	5.1	5.3	4.7
	104-9		Railway Street (W)	L	21	12	12	4	10	7	6	5	14.9	16.6	18.7	17.0	21.0	15.2	15.8	B	B	B	B	B	B	B	1.0	1.0	0.8	1.4	1.2	0.8	0.8
	104-11	Railway Street (W)	Railway Street (E)	T	188	227	269	284	281	288	296	299	22.7	19.1	18.8	20.2	18.6	19.1	18.1	B	B	B	B	B	B	B	5.0	5.0	5.0	5.4	5.2	5.0	5.4
	104-12		Princes Highway (N)	L	41	19	26	25	22	21	18	19	24.3	27.6	25.7	28.9	23.8	27.3	25.6	B	B	B	C	B	B	B	2.0	2.4	2.2	2.6	2.0	1.8	2.2
		All			1,517	1,557	1,641	1,656	1,752	1,802	1,786	1,784	24.1	25.3	23.6	28.3	28.7	28.8	29.5	B	B	B	B	C	C	C	9.5	8.8	8.0	8.0	9.6	9.5	8.8
Princes Highway	105-1	Princes Highway (N)	Tarrawanna Road (W)	R	104	49	83	64	54	59	51	53	32.1	37.7	36.6	38.0	37.9	37.1	36.4	C	C	C	C	C	C	C	4.0	5.0	4.8	4.4	4.2	4.5	4.0
Short Street	105-2		Princes Highway (S)	T	211	242	196	233	260	262	261	263	6.5	10.4	7.7	7.4	8.2	8.1	7.3	A	A	A	A	A	A	A	4.0	3.0	2.8	3.3	2.8	3.5	2.8
Tarrawanna Road	105-3		Short Street (E)	L	80	97	81	85	89	99	94	99	15.6	17.2	15.1	14.7	14.1	16.1	14.3	B	B	B	B	A	B	A	5.0	3.6	4.6	4.2	4.0	4.5	4.4
	105-4	Short Street (E)	Princes Highway (N)	R	152	118	113	102	114	124	122	120	42.6	39.6	36.3	37.3	38.1	39.9	37.0	D	C	C	C	C	C	C	7.0	5.6	5.4	5.8	5.8	6.3	5.8
	105-5		Tarrawanna Road (W)	T	117	102	90	89	86	88	87	88	33.4	28.8	28.5	30.2	28.9	29.9	28.8	C	C	B	C	C	C	C	5.0	4.4	4.4	4.6	4.6	4.5	4.6
	105-6		Princes Highway (S)	L	77	96	75	71	82	75	75	75	36.3	32.2	32.7	33.3	33.2	33.5	33.0	C	C	C	C	C	C	C	5.0	4.0	4.2	4.4	4.4	4.3	4.4
	105-7	Princes Highway (S)	Short Street (E)	R	92	107	95	91	95	91	93	91	25.0	21.2	24.1	23.4	23.5	25.2	22.9	B	B	B	B	B	B	B	6.0	4.2	4.2	4.4	4.0	4.3	4.2
	105-8		Princes Highway (N)	T	315	343	374	348	386	403	415	404	12.2	12.9	13.1	13.0	12.8	13.1	13.0	A	A	A	A	A	A	A	4.0	4.0	4.1	3.9	4.1	4.6	4.1
	105-9		Tarrawanna Road (W)	L	99	119	125	121	123	114	108	113	16.6	15.3	15.0	15.0	14.5	14.3	14.4	B	B	B	B	A	A	A	5.0	4.8	4.6	4.2	4.6	4.5	4.6
	105-10	Tarrawanna Road (W)	Princes Highway (S)	R	69	66	82	80	91	91	97	91	54.0	41.7	42.6	45.6	45.7	46.5	44.8	D	C	D	D	D	D	D	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	105-11		Short Street (E)	T	62	48	46	44	49	56	55	55	30.0	26.8	25.3	28.5	27.5	27.7	28.0	C	B	B	C	B	B	B	1.0	1.4	1.4	1.3	1.4	1.3	1.4
	105-12		Princes Highway (N)	L	57	39	48	26	51	41	40	25	24.7	29.2	31.6	27.3	27.7	30.7	29.3	B	C	C	B	B	C	C	2.0	2.6	2.2	2.6	2.2	2.3	2.0
		All			1,435	1,426	1,408	1,354	1,479	1,503	1,497	1,479	22.0	21.9	20.6	20.9	20.8	21.4	20.4	B	B	B	B	B	B	B	7.0	5.6	5.4	5.8	5.8	6.3	5.8

Intersection	Movement Code	From	To	Turn	Volume (veh/h)								Delay (s)							LOS							Max Queue (veh)						
					2022 Survey	2022 Base	2036 Do Min	2036 Upgraded Do Min	2036 Scenario A	2036 Scenario B	2036 Scenario A + Round	2036 Scenario B + Round	2022 Base	2036 Do Min	2036 Upgraded Do Min	2036 Scenario A	2036 Scenario B	2036 Scenario A + Round	2036 Scenario B + Round	2022 Base	2036 Do Min	2036 Upgraded Do Min	2036 Scenario A	2036 Scenario B	2036 Scenario A + Round	2036 Scenario B + Round	2022 Base	2036 Do Min	2036 Upgraded Do Min	2036 Scenario A	2036 Scenario B	2036 Scenario A + Round	2036 Scenario B + Round
Underwood Street	106-1	Underwood Street (N)	The Avenue (W)	R	27	45	39	46	53	54	54	54	3.5	3.6	2.7	3.4	4.1	2.9	3.9	A	A	A	A	A	A	A	2.0	1.4	1.2	1.8	2.0	2.0	2.0
The Avenue	106-2		Underwood Street (S)	T	168	177	173	185	214	215	217	221	0.7	0.7	0.7	0.7	0.9	0.6	0.8	A	A	A	A	A	A	A	2.0	1.2	1.2	1.6	2.0	1.5	2.0
	106-8	Underwood Street (S)	Underwood Street (N)	T	219	211	276	295	279	310	290	325	1.4	1.4	1.4	1.5	1.5	1.5	1.5	A	A	A	A	A	A	A	0.0	0.0	0.2	0.4	0.6	0.5	0.8
	106-9		The Avenue (W)	L	24	29	22	18	20	23	19	23	1.9	2.2	2.3	2.2	2.4	2.1	2.3	A	A	A	A	A	A	A	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	106-10	The Avenue (W)	Underwood Street (S)	R	10	4	13	12	10	9	10	9	13.8	13.3	13.5	13.8	14.7	15.5	14.4	A	A	A	A	B	B	A	1.0	1.4	1.2	1.4	1.2	1.5	1.2
	106-12		Underwood Street (N)	L	0	11	17	17	25	33	33	33	10.1	10.7	11.0	9.9	11.4	10.0	11.0	A	A	A	A	A	A	A	2.0	1.2	1.2	1.8	1.6	1.8	1.6
		All			448	477	540	572	602	644	623	666	13.8	13.3	13.5	13.8	14.7	15.5	14.4	A	A	A	A	B	B	A	2.0	1.4	1.2	1.8	2.0	2.0	2.0
Underwood Street	107-1	Underwood Street (N)	Francis Street (W)	R	6	22	20	23	20	20	18	20	2.3	2.8	4.6	2.7	2.6	3.0	2.6	A	A	A	A	A	A	A	1.0	0.8	1.2	1.0	1.0	1.0	0.8
Francis Street	107-2		Underwood Street (S)	T	151	142	165	184	209	210	212	214	0.3	0.2	0.2	0.2	0.3	0.2	0.3	A	A	A	A	A	A	A	0.0	0.2	0.6	0.4	1.4	0.5	0.8
	107-8	Underwood Street (S)	Underwood Street (N)	T	159	200	223	225	234	259	243	255	0.3	0.4	0.3	0.4	0.4	0.4	0.3	A	A	A	A	A	A	A	0.0	0.4	0.6	0.4	0.4	0.0	0.2
	107-9		Francis Street (W)	L	109	74	91	87	83	88	86	89	0.6	0.6	0.5	0.5	0.6	0.6	0.6	A	A	A	A	A	A	A	1.0	0.2	0.0	0.0	0.2	0.0	0.2
	107-10	Francis Street (W)	Underwood Street (S)	R	54	68	72	71	83	82	81	82	12.0	11.4	11.6	10.8	11.7	11.1	11.4	A	A	A	A	A	A	A	3.0	3.4	3.8	2.6	2.6	2.5	2.6
	107-12		Underwood Street (N)	L	6	10	16	16	19	16	17	16	10.1	9.8	9.2	9.8	10.4	10.0	10.0	A	A	A	A	A	A	A	2.0	1.2	1.2	1.6	1.8	1.5	1.8
		All			485	516	587	606	648	676	656	676	12.0	11.4	11.6	10.8	11.7	11.1	11.4	A	A	A	A	A	A	A	3.0	3.4	3.8	2.6	2.6	2.5	2.6
Underwood Street	108-1	Underwood Street (N)	Tarrawanna Road (W)	R	93	79	83	85	104	105	102	111	9.1	6.1	5.7	6.4	13.4	8.3	12.1	A	A	A	A	A	A	A	5.0	2.8	3.0	3.0	3.8	3.3	4.6
Tarrawanna Road	108-3		Tarrawanna Road (E)	L	83	102	101	108	122	119	126	120	4.3	3.4	3.7	4.1	11.7	5.2	8.9	A	A	A	A	A	A	A	2.0	2.0	4.8	2.4	3.2	2.5	4.6
	108-4	Tarrawanna Road (E)	Underwood Street (N)	R	164	147	175	174	164	179	156	182	1.7	2.3	2.2	2.3	3.0	2.8	3.0	A	A	A	A	A	A	A	2.0	1.8	1.8	1.8	2.0	2.0	2.0
	108-5		Tarrawanna Road (W)	T	174	212	201	186	198	190	190	185	0.4	0.4	0.5	0.4	0.6	0.5	0.5	A	A	A	A	A	A	A	1.0	0.8	0.8	1.0	1.0	1.3	1.2
	108-11	Tarrawanna Road (W)	Underwood Street (N)	T	88	89	84	63	99	89	93	77	1.6	0.8	0.9	0.9	4.3	1.5	3.4	A	A	A	A	A	A	A	2.0	1.0	3.8	1.0	2.0	1.5	2.2
	108-12		Tarrawanna Road (E)	L	65	91	124	138	134	154	153	167	3.1	2.0	2.1	2.1	5.3	2.3	4.6	A	A	A	A	A	A	A	2.0	0.0	4.6	0.0	3.4	1.0	4.0
		All			667	720	768	754	820	837	819	841	9.1	6.1	5.7	6.4	13.4	8.3	12.1	A	A	A	A	A	A	A	5.0	2.8	4.8	3.0	3.8	3.3	4.6
RSL Car Park	110-5	Collins Street (E)	Collins Street (W)	T	140	144	151	151	260	268	263	277	1.5	1.2	1.2	1.3	2.5	2.5	12.7	A	A	A	A	A	A	A	0.0	0.0	0.0	0.0	1.4	3.3	4.2
Collins Street	110-7	RSL Car Park (S)	Collins Street (E)	R	3	3	2	2	2	3	3	3	0.5	1.5	2.0	9.5	7.5	6.5	42.3	A	A	A	A	A	A	C	0.0	0.2	0.2	0.4	0.6	0.5	0.8
	110-9		Collins Street (W)	L	9	9	10	10	7	10	10	10	0.9	1.0	0.8	2.5	3.7	3.9	57.2	A	A	A	A	A	A	E	0.0	0.4	0.4	0.6	1.0	1.0	1.6
	110-11	Collins Street (W)	Collins Street (E)	T	154	176	190	202	314	343	334	343	1.1	1.2	1.3	1.4	1.3	1.9	1.7	A	A	A	A	A	A	A	0.0	0.0	0.0	0.8	0.0	2.8	1.6
		All			306	332	353	364	583	624	609	633	1.5	1.5	2.0	9.5	7.5	6.5	57.2	A	A	A	A	A	A	E	0.0	0.4	0.4	0.8	1.4	3.3	4.2
Wilga Street	111-1	Wilga Street (N)	Collins Street (W)	R	48	62	54	54	64	69	62	69	14.5	11.0	11.4	29.7	34.9	11.1	19.9	B	A	A	C	C	A	B	3.0	2.4	2.8	4.2	3.8	3.3	3.6
Collins Street	111-2		Wilga Street (S)	T	77	79	70	70	207	211	199	209	12.6	11.8	12.1	28.2	32.1	10.7	17.7	A	A	A	B	C	A	B	3.0	2.8	3.0	6.8	7.8	5.3	6.8
	111-3		Collins Street (E)	L	20	19	17	17	20	21	23	20	13.8	9.1	9.9	25.0	27.3	11.2	17.7	A	A	A	B	B	A	B	1.0	1.4	1.4	2.0	1.8	1.8	1.8
	111-4	Collins Street (E)	Wilga Street (N)	R	8	5	7	7	8	7	7	7	3.2	2.1	2.6	3.3	3.4	15.8	12.8	A	A	A	A	A	B	A	1.0	0.4	0.6	0.8	0.8	1.0	1.2
	111-5		Collins Street (W)	T	14	10	19	19	24	24	24	24	0.0	0.0	0.0	0.1	0.1	14.6	17.6	A	A	A	A	A	B	B	0.0	0.0	0.0	0.0	0.0	2.0	1.8
	111-6		Wilga Street (S)	L	3	6	2	2	5	4	5	4	1.5	1.7	1.7	1.5	1.6	7.2	11.1	A	A	A	A	A	A	A	0.0	0.0	0.0	0.0	0.0	0.8	0.8
	111-7	Wilga Street (S)	Collins Street (E)	R	3	1	2	2	4	2	2	2	7.2	12.8	14.6	42.7	43.6	5.8	26.1	A	A	B	D	D	A	B	1.0	0.8	0.8	1.0	0.6	0.5	0.4
	111-8		Wilga Street (N)	T	104	108	105	106	224	223	239	238	13.7	13.8	14.7	42.8	47.1	6.7	10.9	A	A	B	D	D	A	A	3.0	3.0	3.4	6.2	6.6	4.3	5.6
	111-9		Collins Street (W)	L	78	72	78	78	172	176	178	185	11.6	11.4	11.8	40.3	44.0	7.0	12.8	A	A	A	C	D	A	A	3.0	2.8	3.2	5.4	5.4	4.5	4.8
	111-10	Collins Street (W)	Wilga Street (S)	R	82	76	69	82	203	238	220	238	1.1	1.3	1.3	3.3	2.9	7.5	7.5	A	A	A	A	A	A	A	1.0	1.0	1.4	4.0	4.0	4.8	4.4
	111-11		Collins Street (E)	T	9	20	28	28	29	26	30	26	0.2	0.5	0.9	1.7	1.7	8.9	9.2	A	A	A	A	A	A	A	0.0	0.0	0.2	0.6	0.8	2.0	2.0
	111-12		Wilga Street (N)	L	66	84	95	94	84	82	86	81	0.8	1.0	1.1	2.3	2.3	8.2	7.0	A	A	A	A	A	A	A	0.0	0.8	1.0	1.8	2.0	3.5	3.0
		All			512	542	546	558	1,044	1,082	1,073	1,102	14.5	13.8	14.7	42.8	47.1	15.8	26.1	B	A	B	D	D	B	B	3.0	3.0	3.4	6.8	7.8	5.3	6.8
Wilga Street	112-1	Wilga Street (N)	RSL Car Park (W)	R	15	16	12	13	15	13	15	13	3.0	3.9	4.2	4.5	4.6	5.5	5.2	A	A	A	A	A	A	A	0.0	1.0	0.8	1.0	1.0	1.0	1.0
RSL Car Park	112-2		Wilga Street (S)	T	147	144	129	142	399	439	409	438	1.0	1.1	1.1	1.2	1.2	1.6	1.5	A	A	A	A	A	A	A	0.0	0.2	0.2	0.4	1.2	2.8	0.8
	112-8	Wilga Street (S)	Wilga Street (N)	T	185	181	187	187	404	405	422	427	0.8	0.8	0.8	13.1	14.9	1.3	3.0	A	A	A	A	B	A	A	0.0	0.0	0.0	3.6	4.0	2.3	3.0
	112-9		RSL Car Park (W)	L	1	0	2	2	1	1	1	1	0.0	0.0	0.1	10.8	5.3	0.0	0.0	A	A	A	A	A	A	A	0.0	0.0	0.0	0.4	0.2	0.0	0.0
		All			348	341	330	343	819	858	847	879	3.0	3.9	4.2	13.1	14.9	5.5	5.2	A	A	A	A	B	A	A	0.0	1.0	0.8	3.6	4.0	2.8	3.0
Wilga Street	113-1	Wilga Street (N)	Coles Car Park (W)	R	131	134	112	125	387	425	394	423	0.3	0.3	0.3	0.4	0.5	0.5	0.6	A	A	A	A	A	A	A	1.0	0.8	1.0	2.0	1.8	1.8	1.8
Coles Car Park	113-2		Wilga Street (S)	T	17	10	17	17	12	15	15	15	0.1	0.2	0.2	0.3	0.3	0.3	0.3	A	A	A	A	A	A	A	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	113-8	Wilga Street (S)	Wilga Street (N)	T	18	11	19	19	16	17	17	17	0.0	0.0	0.0	4.5	5.8	0.0	0.0	A	A	A	A	A	A	A	0.0	0.0	0.0	0.6	1.0	0.3	0.0
	113-9		Coles Car Park (W)	L	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	A	A	A	A	A	A	A	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	113-10	Coles Car Park (W)	Wilga Street (S)	R	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	A	A	A	A	A	A	A	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	113-12		Wilga Street (N)	L	168	170	169	169	391	391	406	411	0.6	0.6	0.6	17.0	21.4	1.3	3.5	A	A	A	B	B	A	A	0.0	1.0	1.0	6.2	7.2	3.0	5.2
		All			334	325	318	330	806	848	832	866	0.6	0.6	0.6	17.0	21.4	1.3	3.5	A	A	A	B	B	A	A	1.0	1.0	1.0	6.2	7.2	3.0	5.2

Appendix D: Travel Time Results – Aimsun

P5843 Wilga Street Block Corrimal

Travel Time Data Analysis

Route 1: Princes Highway btwn Collins Street and Tarrawanna Road

AM Peak (0800 - 0900)

Northbound			Section Travel Time								Cumulative Travel Time							
Sections	Section Distance (km)	Cumulative Distance (km)	Observed	2022 Base	2036 Do Minimum	2036 Upgraded Do Minimum	2036 Scenario A	2036 Scenario B	2036 Scenario A + Roundabout	2036 Scenario B + Roundabout	Observed	2022 Base	2036 Do Minimum	2036 Upgraded Do Minimum	2036 Scenario A	2036 Scenario B	2036 Scenario A + Roundabout	2036 Scenario B + Roundabout
Tarrawanna Road	0.00	0.00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
Railway Street	0.20	0.20	0:32	00:27	00:25	00:24	00:25	00:25	00:25	00:24	0:32	0:27	0:25	0:24	0:25	0:25	0:25	0:24
Collins Street	0.34	0.54	0:51	00:43	00:56	00:54	01:08	01:05	01:23	01:00	1:23	1:11	1:21	1:19	1:32	1:30	1:48	1:25

Southbound			Section Travel Time								Cumulative Travel Time							
Sections	Section Distance (km)	Cumulative Distance (km)	Observed	2022 Base	2036 Do Minimum	2036 Upgraded Do Minimum	2036 Scenario A	2036 Scenario B	2036 Scenario A + Roundabout	2036 Scenario B + Roundabout	Observed	2022 Base	2036 Do Minimum	2036 Upgraded Do Minimum	2036 Scenario A	2036 Scenario B	2036 Scenario A + Roundabout	2036 Scenario B + Roundabout
Collins Street	0.00	0.00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
Railway Street	0.34	0.34	0:59	00:51	01:05	00:55	01:02	01:01	01:01	01:01	0:59	0:51	1:05	0:55	1:02	1:01	1:01	1:01
Tarrawanna Road	0.20	0.54	0:22	00:24	00:31	00:29	00:31	00:33	00:30	00:28	1:21	1:15	1:36	1:24	1:33	1:34	1:31	1:29

P5843 Wilga Street Block Corrimal

Travel Time Data Analysis

Route 1: Princes Highway btwn Collins Street and Tarrawanna Road

PM Peak (1600 - 1700)

Northbound			Section Travel Time								Cumulative Travel Time							
Sections	Section Distance (km)	Cumulative Distance (km)	Observed	2022 Base	2036 Do Minimum	2036 Upgraded Do Minimum	2036 Scenario A	2036 Scenario B	2036 Scenario A + Roundabout	2036 Scenario B + Roundabout	Observed	2022 Base	2036 Do Minimum	2036 Upgraded Do Minimum	2036 Scenario A	2036 Scenario B	2036 Scenario A + Roundabout	2036 Scenario B + Roundabout
Tarrawanna Road	0.00	0.00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
Railway Street	0.20	0.20	0:27	00:30	00:28	00:28	00:32	00:30	00:30	00:30	0:27	0:30	0:28	0:28	0:32	0:30	0:30	0:30
Collins Street	0.34	0.54	0:57	00:47	00:55	01:01	01:01	01:10	01:15	01:07	1:24	1:17	1:23	1:29	1:33	1:40	1:45	1:37

Southbound			Section Travel Time								Cumulative Travel Time							
Sections	Section Distance (km)	Cumulative Distance (km)	Observed	2022 Base	2036 Do Minimum	2036 Upgraded Do Minimum	2036 Scenario A	2036 Scenario B	2036 Scenario A + Roundabout	2036 Scenario B + Roundabout	Observed	2022 Base	2036 Do Minimum	2036 Upgraded Do Minimum	2036 Scenario A	2036 Scenario B	2036 Scenario A + Roundabout	2036 Scenario B + Roundabout
Collins Street	0.00	0.00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
Railway Street	0.34	0.34	0:53	01:01	01:03	00:54	01:08	01:08	01:11	01:08	0:53	1:01	1:03	0:54	1:08	1:08	1:11	1:08
Tarrawanna Road	0.20	0.54	0:30	00:30	00:35	00:31	00:31	00:32	00:31	00:30	1:22	1:31	1:38	1:25	1:39	1:40	1:41	1:39

Appendix E: Wilga Street / Rothery Street SIDRA Results

MOVEMENT SUMMARY

Site: 101 [2022 AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.2.202

New Site
Site Category: (None)
Stop (Two-Way)

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: Wilga Street															
1	L2	All MCs	9	5.0	9	5.0	0.544	8.6	LOS A	3.9	28.5	0.12	0.91	0.12	40.2
2	T1	All MCs	5	5.0	5	5.0	0.544	12.1	LOS A	3.9	28.5	0.12	0.91	0.12	44.8
3	R2	All MCs	183	5.0	183	5.0	0.544	13.8	LOS A	3.9	28.5	0.12	0.91	0.12	44.1
Approach			198	5.0	198	5.0	0.544	13.5	LOS A	3.9	28.5	0.12	0.91	0.12	43.9
East: Rothery Street															
4	L2	All MCs	98	5.0	98	5.0	0.055	5.6	LOS A	0.0	0.0	0.00	0.57	0.00	50.4
5	T1	All MCs	169	5.0	169	5.0	0.099	0.0	LOS A	0.1	0.7	0.05	0.06	0.05	58.8
6	R2	All MCs	11	5.0	11	5.0	0.099	8.1	LOS A	0.1	0.7	0.05	0.06	0.05	55.3
Approach			278	5.0	278	5.0	0.099	2.3	NA	0.1	0.7	0.04	0.24	0.04	54.5
North: Wilga Street															
7	L2	All MCs	85	5.0	85	5.0	0.155	9.2	LOS A	0.6	4.6	0.20	0.88	0.20	46.5
8	T1	All MCs	3	5.0	3	5.0	0.155	15.4	LOS B	0.6	4.6	0.20	0.88	0.20	47.4
9	R2	All MCs	32	5.0	32	5.0	0.155	14.6	LOS B	0.6	4.6	0.20	0.88	0.20	42.5
Approach			120	5.0	120	5.0	0.155	10.8	LOS A	0.6	4.6	0.20	0.88	0.20	45.6
West: Rothery Street															
10	L2	All MCs	5	5.0	5	5.0	0.021	5.6	LOS A	0.0	0.0	0.00	0.08	0.00	53.6
11	T1	All MCs	211	5.0	211	5.0	0.106	0.1	LOS A	0.1	1.0	0.06	0.09	0.06	58.5
12	R2	All MCs	14	5.0	14	5.0	0.106	8.8	LOS A	0.1	1.0	0.08	0.09	0.08	53.7
Approach			229	5.0	229	5.0	0.106	0.8	NA	0.1	1.0	0.06	0.09	0.06	58.0
All Vehicles			825	5.0	825	5.0	0.544	5.8	NA	3.9	28.5	0.09	0.45	0.09	50.1

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

MOVEMENT SUMMARY

Site: 101 [2022 PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.2.202

New Site
Site Category: (None)
Stop (Two-Way)

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: Wilga Street															
1	L2	All MCs	8	5.0	8	5.0	0.400	8.5	LOS A	2.2	16.2	0.08	0.94	0.08	42.1
2	T1	All MCs	6	5.0	6	5.0	0.400	10.3	LOS A	2.2	16.2	0.08	0.94	0.08	46.4
3	R2	All MCs	138	5.0	138	5.0	0.400	11.5	LOS A	2.2	16.2	0.08	0.94	0.08	45.7
Approach			153	5.0	153	5.0	0.400	11.2	LOS A	2.2	16.2	0.08	0.94	0.08	45.6
East: Rothery Street															
4	L2	All MCs	98	5.0	98	5.0	0.055	5.6	LOS A	0.0	0.0	0.00	0.57	0.00	50.4
5	T1	All MCs	142	5.0	142	5.0	0.097	0.0	LOS A	0.2	1.5	0.11	0.14	0.11	57.3
6	R2	All MCs	25	5.0	25	5.0	0.097	7.3	LOS A	0.2	1.5	0.11	0.14	0.11	54.4
Approach			265	5.0	265	5.0	0.097	2.8	NA	0.2	1.5	0.07	0.30	0.07	53.6
North: Wilga Street															
7	L2	All MCs	133	5.0	133	5.0	0.183	8.9	LOS A	0.8	5.6	0.15	0.91	0.15	47.1
8	T1	All MCs	4	5.0	4	5.0	0.183	14.5	LOS A	0.8	5.6	0.15	0.91	0.15	48.0
9	R2	All MCs	28	5.0	28	5.0	0.183	13.5	LOS A	0.8	5.6	0.15	0.91	0.15	43.2
Approach			165	5.0	165	5.0	0.183	9.9	LOS A	0.8	5.6	0.15	0.91	0.15	46.5
West: Rothery Street															
10	L2	All MCs	6	5.0	6	5.0	0.017	5.6	LOS A	0.0	0.0	0.00	0.12	0.00	53.0
11	T1	All MCs	163	5.0	163	5.0	0.084	0.1	LOS A	0.1	0.8	0.06	0.09	0.06	58.3
12	R2	All MCs	12	5.0	12	5.0	0.084	8.3	LOS A	0.1	0.8	0.07	0.09	0.07	53.7
Approach			181	5.0	181	5.0	0.084	0.8	NA	0.1	0.8	0.06	0.09	0.06	57.7
All Vehicles			764	5.0	764	5.0	0.400	5.5	NA	2.2	16.2	0.09	0.51	0.09	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.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [2036 AM Do Minimum (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.2.202

New Site
Site Category: (None)
Stop (Two-Way)

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: Wilga Street															
1	L2	All MCs	12	5.0	12	5.0	0.854	8.7	LOS A	17.7	129.6	0.43	0.63	0.43	27.1
2	T1	All MCs	6	5.0	6	5.0	0.854	27.9	LOS B	17.7	129.6	0.43	0.63	0.43	32.6
3	R2	All MCs	225	5.0	225	5.0	0.854	39.3	LOS C	17.7	129.6	0.43	0.63	0.43	31.8
Approach			243	5.0	243	5.0	0.854	37.6	LOS C	17.7	129.6	0.43	0.63	0.43	31.6
East: Rothery Street															
4	L2	All MCs	120	5.0	120	5.0	0.067	5.6	LOS A	0.0	0.0	0.00	0.57	0.00	50.4
5	T1	All MCs	208	5.0	208	5.0	0.123	0.0	LOS A	0.1	0.9	0.06	0.07	0.06	58.8
6	R2	All MCs	13	5.0	13	5.0	0.123	8.9	LOS A	0.1	0.9	0.06	0.07	0.06	55.2
Approach			341	5.0	341	5.0	0.123	2.3	NA	0.1	0.9	0.04	0.25	0.04	54.5
North: Wilga Street															
7	L2	All MCs	104	5.0	104	5.0	0.212	9.5	LOS A	0.9	6.5	0.26	0.86	0.26	45.8
8	T1	All MCs	4	5.0	4	5.0	0.212	18.9	LOS B	0.9	6.5	0.26	0.86	0.26	46.7
9	R2	All MCs	39	5.0	39	5.0	0.212	17.6	LOS B	0.9	6.5	0.26	0.86	0.26	41.7
Approach			147	5.0	147	5.0	0.212	11.9	LOS A	0.9	6.5	0.26	0.86	0.26	44.9
West: Rothery Street															
10	L2	All MCs	6	5.0	6	5.0	0.026	5.6	LOS A	0.0	0.0	0.00	0.08	0.00	53.6
11	T1	All MCs	259	5.0	259	5.0	0.132	0.2	LOS A	0.2	1.3	0.07	0.10	0.07	58.4
12	R2	All MCs	17	5.0	17	5.0	0.132	9.9	LOS A	0.2	1.3	0.09	0.10	0.09	53.6
Approach			282	5.0	282	5.0	0.132	0.9	NA	0.2	1.3	0.07	0.10	0.07	57.9
All Vehicles			1014	5.0	1014	5.0	0.854	11.8	NA	17.7	129.6	0.17	0.39	0.17	44.2

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

MOVEMENT SUMMARY

Site: 101 [2036 PM Do Minimum (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.2.202

New Site
Site Category: (None)
Stop (Two-Way)

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: Wilga Street															
1	L2	All MCs	9	5.0	9	5.0	0.553	8.6	LOS A	4.0	29.2	0.12	0.90	0.12	39.2
2	T1	All MCs	7	5.0	7	5.0	0.553	12.3	LOS A	4.0	29.2	0.12	0.90	0.12	43.9
3	R2	All MCs	161	5.0	161	5.0	0.553	15.3	LOS B	4.0	29.2	0.12	0.90	0.12	43.2
Approach			178	5.0	178	5.0	0.553	14.8	LOS B	4.0	29.2	0.12	0.90	0.12	43.0
East: Rothery Street															
4	L2	All MCs	115	5.0	115	5.0	0.064	5.6	LOS A	0.0	0.0	0.00	0.57	0.00	50.4
5	T1	All MCs	166	5.0	166	5.0	0.114	0.0	LOS A	0.3	1.8	0.13	0.15	0.13	57.2
6	R2	All MCs	29	5.0	29	5.0	0.114	7.7	LOS A	0.3	1.8	0.13	0.15	0.13	54.3
Approach			311	5.0	311	5.0	0.114	2.8	NA	0.3	1.8	0.08	0.31	0.08	53.6
North: Wilga Street															
7	L2	All MCs	155	5.0	155	5.0	0.225	9.1	LOS A	1.0	7.2	0.17	0.89	0.17	46.8
8	T1	All MCs	5	5.0	5	5.0	0.225	16.5	LOS B	1.0	7.2	0.17	0.89	0.17	47.7
9	R2	All MCs	34	5.0	34	5.0	0.225	15.2	LOS B	1.0	7.2	0.17	0.89	0.17	42.8
Approach			194	5.0	194	5.0	0.225	10.4	LOS A	1.0	7.2	0.17	0.89	0.17	46.2
West: Rothery Street															
10	L2	All MCs	7	5.0	7	5.0	0.020	5.6	LOS A	0.0	0.0	0.00	0.12	0.00	53.0
11	T1	All MCs	191	5.0	191	5.0	0.099	0.1	LOS A	0.1	1.0	0.07	0.10	0.07	58.2
12	R2	All MCs	14	5.0	14	5.0	0.099	9.0	LOS A	0.1	1.0	0.08	0.10	0.08	53.6
Approach			212	5.0	212	5.0	0.099	0.9	NA	0.1	1.0	0.07	0.10	0.07	57.7
All Vehicles			894	5.0	894	5.0	0.553	6.4	NA	4.0	29.2	0.11	0.50	0.11	49.4

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

MOVEMENT SUMMARY

Site: 101 [2036 AM Scenario A (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.2.202

New Site
Site Category: (None)
Stop (Two-Way)

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: Wilga Street															
1	L2	All MCs	16	5.0	16	5.0	1.288	304.9	LOS F	196.2	1432.4	1.00	1.04	1.14	2.7
2	T1	All MCs	8	5.0	8	5.0	1.288	551.5	LOS F	196.2	1432.4	1.00	1.04	1.14	3.9
3	R2	All MCs	313	5.0	313	5.0	1.288	702.3	LOS F	196.2	1432.4	1.00	1.04	1.14	3.7
Approach			337	5.0	337	5.0	1.288	679.9	LOS F	196.2	1432.4	1.00	1.04	1.14	3.7
East: Rothery Street															
4	L2	All MCs	180	5.0	180	5.0	0.100	5.6	LOS A	0.0	0.0	0.00	0.57	0.00	50.4
5	T1	All MCs	208	5.0	208	5.0	0.123	0.0	LOS A	0.1	0.9	0.06	0.07	0.06	58.8
6	R2	All MCs	13	5.0	13	5.0	0.123	8.9	LOS A	0.1	0.9	0.06	0.07	0.06	55.2
Approach			401	5.0	401	5.0	0.123	2.8	NA	0.1	0.9	0.03	0.30	0.03	53.7
North: Wilga Street															
7	L2	All MCs	104	5.0	104	5.0	0.224	9.6	LOS A	1.0	6.9	0.29	0.85	0.29	45.5
8	T1	All MCs	6	5.0	6	5.0	0.224	21.0	LOS B	1.0	6.9	0.29	0.85	0.29	46.5
9	R2	All MCs	39	5.0	39	5.0	0.224	18.2	LOS B	1.0	6.9	0.29	0.85	0.29	41.4
Approach			149	5.0	149	5.0	0.224	12.3	LOS A	1.0	6.9	0.29	0.85	0.29	44.7
West: Rothery Street															
10	L2	All MCs	6	5.0	6	5.0	0.028	5.6	LOS A	0.0	0.0	0.00	0.07	0.00	53.7
11	T1	All MCs	259	5.0	259	5.0	0.140	0.2	LOS A	0.3	2.1	0.12	0.14	0.12	57.7
12	R2	All MCs	25	5.0	25	5.0	0.140	11.0	LOS A	0.3	2.1	0.14	0.16	0.14	53.0
Approach			291	5.0	291	5.0	0.140	1.2	NA	0.3	2.1	0.12	0.14	0.12	57.1
All Vehicles			1178	5.0	1178	5.0	1.288	197.3	NA	196.2	1432.4	0.36	0.54	0.40	9.4

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

MOVEMENT SUMMARY

Site: 101 [2036 PM Scenario A (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.2.202

New Site
Site Category: (None)
Stop (Two-Way)

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: Wilga Street															
1	L2	All MCs	16	5.0	16	5.0	1.086	127.7	LOS F	165.0	1204.7	1.00	1.02	1.06	4.7
2	T1	All MCs	13	5.0	13	5.0	1.086	274.3	LOS F	165.0	1204.7	1.00	1.02	1.06	6.6
3	R2	All MCs	269	5.0	269	5.0	1.086	399.6	LOS F	165.0	1204.7	1.00	1.02	1.06	6.3
Approach			298	5.0	298	5.0	1.086	379.9	LOS F	165.0	1204.7	1.00	1.02	1.06	6.2
East: Rothery Street															
4	L2	All MCs	237	5.0	237	5.0	0.132	5.6	LOS A	0.0	0.0	0.00	0.57	0.00	50.4
5	T1	All MCs	166	5.0	166	5.0	0.114	0.0	LOS A	0.3	1.8	0.13	0.15	0.13	57.2
6	R2	All MCs	29	5.0	29	5.0	0.114	7.7	LOS A	0.3	1.8	0.13	0.15	0.13	54.3
Approach			433	5.0	433	5.0	0.132	3.6	NA	0.3	1.8	0.06	0.38	0.06	52.5
North: Wilga Street															
7	L2	All MCs	155	5.0	155	5.0	0.248	9.4	LOS A	1.1	8.1	0.21	0.88	0.21	46.3
8	T1	All MCs	11	5.0	11	5.0	0.248	20.5	LOS B	1.1	8.1	0.21	0.88	0.21	47.3
9	R2	All MCs	34	5.0	34	5.0	0.248	16.1	LOS B	1.1	8.1	0.21	0.88	0.21	42.4
Approach			199	5.0	199	5.0	0.248	11.1	LOS A	1.1	8.1	0.21	0.88	0.21	45.8
West: Rothery Street															
10	L2	All MCs	7	5.0	7	5.0	0.023	5.6	LOS A	0.0	0.0	0.00	0.10	0.00	53.3
11	T1	All MCs	191	5.0	191	5.0	0.114	0.2	LOS A	0.3	2.3	0.16	0.20	0.16	56.8
12	R2	All MCs	28	5.0	28	5.0	0.114	11.0	LOS A	0.3	2.3	0.20	0.22	0.20	52.2
Approach			226	5.0	226	5.0	0.114	1.7	NA	0.3	2.3	0.16	0.20	0.16	56.0
All Vehicles			1156	5.0	1156	5.0	1.086	101.5	NA	165.0	1204.7	0.35	0.59	0.36	16.3

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

MOVEMENT SUMMARY

Site: 101 [2036 AM Scenario B (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.2.202

New Site
Site Category: (None)
Stop (Two-Way)

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: Wilga Street															
1	L2	All MCs	17	5.0	17	5.0	1.387	391.8	LOS F	211.6	1544.5	1.00	1.05	1.16	2.3
2	T1	All MCs	9	5.0	9	5.0	1.387	662.3	LOS F	211.6	1544.5	1.00	1.05	1.16	3.3
3	R2	All MCs	334	5.0	334	5.0	1.387	827.8	LOS F	211.6	1544.5	1.00	1.05	1.16	3.2
Approach			360	5.0	360	5.0	1.387	803.1	LOS F	211.6	1544.5	1.00	1.05	1.16	3.1
East: Rothery Street															
4	L2	All MCs	185	5.0	185	5.0	0.103	5.6	LOS A	0.0	0.0	0.00	0.57	0.00	50.4
5	T1	All MCs	208	5.0	208	5.0	0.123	0.0	LOS A	0.1	0.9	0.06	0.07	0.06	58.8
6	R2	All MCs	13	5.0	13	5.0	0.123	8.9	LOS A	0.1	0.9	0.06	0.07	0.06	55.2
Approach			406	5.0	406	5.0	0.123	2.8	NA	0.1	0.9	0.03	0.30	0.03	53.6
North: Wilga Street															
7	L2	All MCs	104	5.0	104	5.0	0.224	9.5	LOS A	1.0	7.0	0.29	0.85	0.29	45.5
8	T1	All MCs	6	5.0	6	5.0	0.224	21.2	LOS B	1.0	7.0	0.29	0.85	0.29	46.5
9	R2	All MCs	39	5.0	39	5.0	0.224	18.3	LOS B	1.0	7.0	0.29	0.85	0.29	41.4
Approach			149	5.0	149	5.0	0.224	12.3	LOS A	1.0	7.0	0.29	0.85	0.29	44.6
West: Rothery Street															
10	L2	All MCs	6	5.0	6	5.0	0.028	5.6	LOS A	0.0	0.0	0.00	0.07	0.00	53.7
11	T1	All MCs	259	5.0	259	5.0	0.141	0.2	LOS A	0.3	2.2	0.12	0.15	0.12	57.6
12	R2	All MCs	26	5.0	26	5.0	0.141	11.0	LOS A	0.3	2.2	0.15	0.16	0.15	52.9
Approach			292	5.0	292	5.0	0.141	1.3	NA	0.3	2.2	0.12	0.15	0.12	57.0
All Vehicles			1207	5.0	1207	5.0	1.387	242.2	NA	211.6	1544.5	0.37	0.55	0.42	8.0

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

MOVEMENT SUMMARY

Site: 101 [2036 PM Scenario B (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.2.202

New Site
Site Category: (None)
Stop (Two-Way)

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: Wilga Street															
1	L2	All MCs	17	5.0	17	5.0	1.117	155.6	LOS F	169.5	1237.3	1.00	1.02	1.07	4.4
2	T1	All MCs	13	5.0	13	5.0	1.117	303.7	LOS F	169.5	1237.3	1.00	1.02	1.07	6.2
3	R2	All MCs	273	5.0	273	5.0	1.117	430.9	LOS F	169.5	1237.3	1.00	1.02	1.07	5.9
Approach			302	5.0	302	5.0	1.117	410.3	LOS F	169.5	1237.3	1.00	1.02	1.07	5.8
East: Rothery Street															
4	L2	All MCs	249	5.0	249	5.0	0.139	5.6	LOS A	0.0	0.0	0.00	0.57	0.00	50.4
5	T1	All MCs	166	5.0	166	5.0	0.114	0.0	LOS A	0.3	1.8	0.13	0.15	0.13	57.2
6	R2	All MCs	29	5.0	29	5.0	0.114	7.7	LOS A	0.3	1.8	0.13	0.15	0.13	54.3
Approach			445	5.0	445	5.0	0.139	3.7	NA	0.3	1.8	0.06	0.39	0.06	52.4
North: Wilga Street															
7	L2	All MCs	155	5.0	155	5.0	0.253	9.4	LOS A	1.1	8.3	0.22	0.87	0.22	46.3
8	T1	All MCs	12	5.0	12	5.0	0.253	21.1	LOS B	1.1	8.3	0.22	0.87	0.22	47.2
9	R2	All MCs	34	5.0	34	5.0	0.253	16.2	LOS B	1.1	8.3	0.22	0.87	0.22	42.3
Approach			200	5.0	200	5.0	0.253	11.2	LOS A	1.1	8.3	0.22	0.87	0.22	45.8
West: Rothery Street															
10	L2	All MCs	7	5.0	7	5.0	0.023	5.6	LOS A	0.0	0.0	0.00	0.10	0.00	53.3
11	T1	All MCs	191	5.0	191	5.0	0.115	0.2	LOS A	0.3	2.4	0.17	0.21	0.17	56.7
12	R2	All MCs	29	5.0	29	5.0	0.115	11.2	LOS A	0.3	2.4	0.21	0.23	0.21	52.1
Approach			227	5.0	227	5.0	0.115	1.8	NA	0.3	2.4	0.17	0.21	0.17	55.8
All Vehicles			1175	5.0	1175	5.0	1.117	109.1	NA	169.5	1237.3	0.35	0.60	0.36	15.5

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

MOVEMENT SUMMARY

Site: 101v [2036 AM Scenario A - Roundabout (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
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: Wilga Street															
1	L2	All MCs	16	5.0	16	5.0	0.326	6.0	LOS A	2.2	16.3	0.57	0.64	0.57	43.9
2	T1	All MCs	8	5.0	8	5.0	0.326	6.2	LOS A	2.2	16.3	0.57	0.64	0.57	48.1
3	R2	All MCs	313	5.0	313	5.0	0.326	10.8	LOS A	2.2	16.3	0.57	0.64	0.57	46.6
Approach			337	5.0	337	5.0	0.326	10.5	LOS A	2.2	16.3	0.57	0.64	0.57	46.5
East: Rothery Street															
4	L2	All MCs	180	5.0	180	5.0	0.297	4.4	LOS A	2.2	16.4	0.31	0.43	0.31	51.5
5	T1	All MCs	208	5.0	208	5.0	0.297	4.6	LOS A	2.2	16.4	0.31	0.43	0.31	48.1
6	R2	All MCs	13	5.0	13	5.0	0.297	9.2	LOS A	2.2	16.4	0.31	0.43	0.31	50.4
Approach			401	5.0	401	5.0	0.297	4.6	LOS A	2.2	16.4	0.31	0.43	0.31	50.0
North: Wilga Street															
7	L2	All MCs	104	5.0	104	5.0	0.199	8.4	LOS A	1.3	9.2	0.73	0.70	0.73	47.4
8	T1	All MCs	6	5.0	6	5.0	0.199	8.7	LOS A	1.3	9.2	0.73	0.70	0.73	48.7
9	R2	All MCs	39	5.0	39	5.0	0.199	13.3	LOS A	1.3	9.2	0.73	0.70	0.73	39.9
Approach			149	5.0	149	5.0	0.199	9.7	LOS A	1.3	9.2	0.73	0.70	0.73	45.7
West: Rothery Street															
10	L2	All MCs	6	5.0	6	5.0	0.310	6.5	LOS A	2.2	15.8	0.64	0.59	0.64	45.7
11	T1	All MCs	259	5.0	259	5.0	0.310	6.7	LOS A	2.2	15.8	0.64	0.59	0.64	45.4
12	R2	All MCs	25	5.0	25	5.0	0.310	11.4	LOS A	2.2	15.8	0.64	0.59	0.64	45.5
Approach			291	5.0	291	5.0	0.310	7.1	LOS A	2.2	15.8	0.64	0.59	0.64	45.4
All Vehicles			1178	5.0	1178	5.0	0.326	7.6	LOS A	2.2	16.4	0.52	0.56	0.52	47.3

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.

MOVEMENT SUMMARY

Site: 101v [2036 PM Scenario A - Roundabout (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
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: Wilga Street															
1	L2	All MCs	16	5.0	16	5.0	0.280	5.6	LOS A	1.9	13.6	0.52	0.62	0.52	44.2
2	T1	All MCs	13	5.0	13	5.0	0.280	5.9	LOS A	1.9	13.6	0.52	0.62	0.52	48.3
3	R2	All MCs	269	5.0	269	5.0	0.280	10.5	LOS A	1.9	13.6	0.52	0.62	0.52	46.8
Approach			298	5.0	298	5.0	0.280	10.1	LOS A	1.9	13.6	0.52	0.62	0.52	46.8
East: Rothery Street															
4	L2	All MCs	237	5.0	237	5.0	0.319	4.4	LOS A	2.4	17.9	0.31	0.45	0.31	51.4
5	T1	All MCs	166	5.0	166	5.0	0.319	4.6	LOS A	2.4	17.9	0.31	0.45	0.31	48.0
6	R2	All MCs	29	5.0	29	5.0	0.319	9.3	LOS A	2.4	17.9	0.31	0.45	0.31	50.3
Approach			433	5.0	433	5.0	0.319	4.8	LOS A	2.4	17.9	0.31	0.45	0.31	50.3
North: Wilga Street															
7	L2	All MCs	155	5.0	155	5.0	0.239	7.6	LOS A	1.5	11.1	0.68	0.66	0.68	48.5
8	T1	All MCs	11	5.0	11	5.0	0.239	7.8	LOS A	1.5	11.1	0.68	0.66	0.68	49.7
9	R2	All MCs	34	5.0	34	5.0	0.239	12.5	LOS A	1.5	11.1	0.68	0.66	0.68	40.9
Approach			199	5.0	199	5.0	0.239	8.4	LOS A	1.5	11.1	0.68	0.66	0.68	47.4
West: Rothery Street															
10	L2	All MCs	7	5.0	7	5.0	0.235	6.2	LOS A	1.5	11.2	0.59	0.57	0.59	45.9
11	T1	All MCs	191	5.0	191	5.0	0.235	6.4	LOS A	1.5	11.2	0.59	0.57	0.59	45.7
12	R2	All MCs	28	5.0	28	5.0	0.235	11.0	LOS A	1.5	11.2	0.59	0.57	0.59	45.7
Approach			226	5.0	226	5.0	0.235	7.0	LOS A	1.5	11.2	0.59	0.57	0.59	45.7
All Vehicles			1156	5.0	1156	5.0	0.319	7.2	LOS A	2.4	17.9	0.48	0.55	0.48	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.

MOVEMENT SUMMARY

Site: 101v [2036 AM Scenario B - Roundabout (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.2.202

New Site
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: Wilga Street															
1	L2	All MCs	17	5.0	17	5.0	0.347	6.0	LOS A	2.4	17.7	0.58	0.64	0.58	43.8
2	T1	All MCs	9	5.0	9	5.0	0.347	6.2	LOS A	2.4	17.7	0.58	0.64	0.58	48.1
3	R2	All MCs	334	5.0	334	5.0	0.347	10.9	LOS A	2.4	17.7	0.58	0.64	0.58	46.6
Approach			360	5.0	360	5.0	0.347	10.5	LOS A	2.4	17.7	0.58	0.64	0.58	46.5
East: Rothery Street															
4	L2	All MCs	185	5.0	185	5.0	0.301	4.4	LOS A	2.3	16.7	0.31	0.44	0.31	51.4
5	T1	All MCs	208	5.0	208	5.0	0.301	4.6	LOS A	2.3	16.7	0.31	0.44	0.31	48.1
6	R2	All MCs	13	5.0	13	5.0	0.301	9.2	LOS A	2.3	16.7	0.31	0.44	0.31	50.4
Approach			406	5.0	406	5.0	0.301	4.6	LOS A	2.3	16.7	0.31	0.44	0.31	50.0
North: Wilga Street															
7	L2	All MCs	104	5.0	104	5.0	0.204	8.7	LOS A	1.3	9.5	0.74	0.70	0.74	47.2
8	T1	All MCs	6	5.0	6	5.0	0.204	8.9	LOS A	1.3	9.5	0.74	0.70	0.74	48.5
9	R2	All MCs	39	5.0	39	5.0	0.204	13.5	LOS A	1.3	9.5	0.74	0.70	0.74	39.7
Approach			149	5.0	149	5.0	0.204	10.0	LOS A	1.3	9.5	0.74	0.70	0.74	45.5
West: Rothery Street															
10	L2	All MCs	6	5.0	6	5.0	0.318	6.7	LOS A	2.2	16.3	0.67	0.60	0.67	45.6
11	T1	All MCs	259	5.0	259	5.0	0.318	6.9	LOS A	2.2	16.3	0.67	0.60	0.67	45.2
12	R2	All MCs	26	5.0	26	5.0	0.318	11.6	LOS A	2.2	16.3	0.67	0.60	0.67	45.4
Approach			292	5.0	292	5.0	0.318	7.3	LOS A	2.2	16.3	0.67	0.60	0.67	45.3
All Vehicles			1207	5.0	1207	5.0	0.347	7.7	LOS A	2.4	17.7	0.53	0.57	0.53	47.2

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.

MOVEMENT SUMMARY

Site: 101v [2036 PM Scenario B - Roundabout (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.2.202

New Site
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: Wilga Street															
1	L2	All MCs	17	5.0	17	5.0	0.284	5.6	LOS A	1.9	13.9	0.52	0.62	0.52	44.2
2	T1	All MCs	13	5.0	13	5.0	0.284	5.9	LOS A	1.9	13.9	0.52	0.62	0.52	48.3
3	R2	All MCs	273	5.0	273	5.0	0.284	10.5	LOS A	1.9	13.9	0.52	0.62	0.52	46.8
Approach			302	5.0	302	5.0	0.284	10.0	LOS A	1.9	13.9	0.52	0.62	0.52	46.8
East: Rothery Street															
4	L2	All MCs	249	5.0	249	5.0	0.330	4.4	LOS A	2.5	18.6	0.32	0.45	0.32	51.3
5	T1	All MCs	166	5.0	166	5.0	0.330	4.6	LOS A	2.5	18.6	0.32	0.45	0.32	48.0
6	R2	All MCs	29	5.0	29	5.0	0.330	9.3	LOS A	2.5	18.6	0.32	0.45	0.32	50.3
Approach			445	5.0	445	5.0	0.330	4.8	LOS A	2.5	18.6	0.32	0.45	0.32	50.3
North: Wilga Street															
7	L2	All MCs	155	5.0	155	5.0	0.241	7.6	LOS A	1.5	11.2	0.69	0.66	0.69	48.4
8	T1	All MCs	12	5.0	12	5.0	0.241	7.9	LOS A	1.5	11.2	0.69	0.66	0.69	49.7
9	R2	All MCs	34	5.0	34	5.0	0.241	12.5	LOS A	1.5	11.2	0.69	0.66	0.69	40.9
Approach			200	5.0	200	5.0	0.241	8.5	LOS A	1.5	11.2	0.69	0.66	0.69	47.4
West: Rothery Street															
10	L2	All MCs	7	5.0	7	5.0	0.237	6.2	LOS A	1.6	11.3	0.59	0.57	0.59	45.9
11	T1	All MCs	191	5.0	191	5.0	0.237	6.4	LOS A	1.6	11.3	0.59	0.57	0.59	45.6
12	R2	All MCs	29	5.0	29	5.0	0.237	11.1	LOS A	1.6	11.3	0.59	0.57	0.59	45.7
Approach			227	5.0	227	5.0	0.237	7.0	LOS A	1.6	11.3	0.59	0.57	0.59	45.6
All Vehicles			1175	5.0	1175	5.0	0.330	7.2	LOS A	2.5	18.6	0.49	0.55	0.49	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.

MOVEMENT SUMMARY

Site: 101 [2036 AM Scenario A - 50% (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Stop (Two-Way)

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: Wilga Street															
1	L2	All MCs	14	5.0	14	5.0	1.061	105.9	LOS F	161.0	1175.2	1.00	1.02	1.05	4.7
2	T1	All MCs	7	5.0	7	5.0	1.061	290.5	LOS F	161.0	1175.2	1.00	1.02	1.05	6.5
3	R2	All MCs	268	5.0	268	5.0	1.061	402.0	LOS F	161.0	1175.2	1.00	1.02	1.05	6.2
Approach			289	5.0	289	5.0	1.061	385.2	LOS F	161.0	1175.2	1.00	1.02	1.05	6.2
East: Rothery Street															
4	L2	All MCs	151	5.0	151	5.0	0.084	5.6	LOS A	0.0	0.0	0.00	0.57	0.00	50.4
5	T1	All MCs	208	5.0	208	5.0	0.123	0.0	LOS A	0.1	0.9	0.06	0.07	0.06	58.8
6	R2	All MCs	13	5.0	13	5.0	0.123	8.9	LOS A	0.1	0.9	0.06	0.07	0.06	55.2
Approach			372	5.0	372	5.0	0.123	2.6	NA	0.1	0.9	0.04	0.27	0.04	54.1
North: Wilga Street															
7	L2	All MCs	104	5.0	104	5.0	0.218	9.6	LOS A	0.9	6.7	0.27	0.85	0.27	45.6
8	T1	All MCs	5	5.0	5	5.0	0.218	19.9	LOS B	0.9	6.7	0.27	0.85	0.27	46.6
9	R2	All MCs	39	5.0	39	5.0	0.218	17.9	LOS B	0.9	6.7	0.27	0.85	0.27	41.5
Approach			148	5.0	148	5.0	0.218	12.1	LOS A	0.9	6.7	0.27	0.85	0.27	44.8
West: Rothery Street															
10	L2	All MCs	6	5.0	6	5.0	0.027	5.6	LOS A	0.0	0.0	0.00	0.07	0.00	53.7
11	T1	All MCs	259	5.0	259	5.0	0.136	0.2	LOS A	0.2	1.7	0.09	0.12	0.09	58.1
12	R2	All MCs	21	5.0	21	5.0	0.136	10.4	LOS A	0.2	1.7	0.11	0.13	0.11	53.3
Approach			286	5.0	286	5.0	0.136	1.1	NA	0.2	1.7	0.09	0.12	0.09	57.5
All Vehicles			1096	5.0	1096	5.0	1.061	104.5	NA	161.0	1175.2	0.34	0.51	0.35	15.4

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

MOVEMENT SUMMARY

Site: 101 [2036 PM Scenario A - 50% (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Stop (Two-Way)

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: Wilga Street															
1	L2	All MCs	14	5.0	14	5.0	0.843	8.6	LOS A	16.6	120.9	0.36	0.69	0.36	30.2
2	T1	All MCs	11	5.0	11	5.0	0.843	21.2	LOS B	16.6	120.9	0.36	0.69	0.36	35.7
3	R2	All MCs	227	5.0	227	5.0	0.843	31.7	LOS C	16.6	120.9	0.36	0.69	0.36	34.9
Approach			252	5.0	252	5.0	0.843	30.0	LOS C	16.6	120.9	0.36	0.69	0.36	34.7
East: Rothery Street															
4	L2	All MCs	174	5.0	174	5.0	0.097	5.6	LOS A	0.0	0.0	0.00	0.57	0.00	50.4
5	T1	All MCs	166	5.0	166	5.0	0.114	0.0	LOS A	0.3	1.8	0.13	0.15	0.13	57.2
6	R2	All MCs	29	5.0	29	5.0	0.114	7.7	LOS A	0.3	1.8	0.13	0.15	0.13	54.3
Approach			369	5.0	369	5.0	0.114	3.3	NA	0.3	1.8	0.07	0.35	0.07	52.9
North: Wilga Street															
7	L2	All MCs	155	5.0	155	5.0	0.235	9.3	LOS A	1.0	7.6	0.19	0.89	0.19	46.6
8	T1	All MCs	7	5.0	7	5.0	0.235	18.2	LOS B	1.0	7.6	0.19	0.89	0.19	47.5
9	R2	All MCs	34	5.0	34	5.0	0.235	15.7	LOS B	1.0	7.6	0.19	0.89	0.19	42.7
Approach			196	5.0	196	5.0	0.235	10.7	LOS A	1.0	7.6	0.19	0.89	0.19	46.1
West: Rothery Street															
10	L2	All MCs	7	5.0	7	5.0	0.021	5.6	LOS A	0.0	0.0	0.00	0.11	0.00	53.1
11	T1	All MCs	191	5.0	191	5.0	0.106	0.1	LOS A	0.2	1.6	0.12	0.15	0.12	57.5
12	R2	All MCs	21	5.0	21	5.0	0.106	9.9	LOS A	0.2	1.6	0.14	0.15	0.14	52.9
Approach			219	5.0	219	5.0	0.106	1.3	NA	0.2	1.6	0.11	0.15	0.11	56.8
All Vehicles			1036	5.0	1036	5.0	0.843	10.8	NA	16.6	120.9	0.17	0.49	0.17	45.3

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

MOVEMENT SUMMARY

Site: 101 [2036 AM Scenario B - 50% (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Stop (Two-Way)

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: Wilga Street															
1	L2	All MCs	15	5.0	15	5.0	1.108	146.7	LOS F	168.7	1231.6	1.00	1.02	1.07	4.2
2	T1	All MCs	8	5.0	8	5.0	1.108	333.9	LOS F	168.7	1231.6	1.00	1.02	1.07	5.9
3	R2	All MCs	279	5.0	279	5.0	1.108	447.1	LOS F	168.7	1231.6	1.00	1.02	1.07	5.6
Approach			302	5.0	302	5.0	1.108	429.3	LOS F	168.7	1231.6	1.00	1.02	1.07	5.6
East: Rothery Street															
4	L2	All MCs	153	5.0	153	5.0	0.085	5.6	LOS A	0.0	0.0	0.00	0.57	0.00	50.4
5	T1	All MCs	208	5.0	208	5.0	0.123	0.0	LOS A	0.1	0.9	0.06	0.07	0.06	58.8
6	R2	All MCs	13	5.0	13	5.0	0.123	8.9	LOS A	0.1	0.9	0.06	0.07	0.06	55.2
Approach			374	5.0	374	5.0	0.123	2.6	NA	0.1	0.9	0.04	0.28	0.04	54.0
North: Wilga Street															
7	L2	All MCs	104	5.0	104	5.0	0.218	9.6	LOS A	0.9	6.7	0.27	0.85	0.27	45.6
8	T1	All MCs	5	5.0	5	5.0	0.218	20.0	LOS B	0.9	6.7	0.27	0.85	0.27	46.6
9	R2	All MCs	39	5.0	39	5.0	0.218	18.0	LOS B	0.9	6.7	0.27	0.85	0.27	41.5
Approach			148	5.0	148	5.0	0.218	12.1	LOS A	0.9	6.7	0.27	0.85	0.27	44.8
West: Rothery Street															
10	L2	All MCs	6	5.0	6	5.0	0.027	5.6	LOS A	0.0	0.0	0.00	0.07	0.00	53.7
11	T1	All MCs	259	5.0	259	5.0	0.136	0.2	LOS A	0.2	1.7	0.09	0.12	0.09	58.1
12	R2	All MCs	21	5.0	21	5.0	0.136	10.5	LOS A	0.2	1.7	0.11	0.13	0.11	53.3
Approach			286	5.0	286	5.0	0.136	1.1	NA	0.2	1.7	0.09	0.12	0.09	57.5
All Vehicles			1111	5.0	1111	5.0	1.108	119.5	NA	168.7	1231.6	0.35	0.51	0.36	14.0

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

MOVEMENT SUMMARY

Site: 101 [2036 PM Scenario B - 50% (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: (None)
Stop (Two-Way)

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: Wilga Street															
1	L2	All MCs	14	5.0	14	5.0	0.853	8.6	LOS A	17.8	129.9	0.38	0.67	0.38	29.4
2	T1	All MCs	11	5.0	11	5.0	0.853	22.2	LOS B	17.8	129.9	0.38	0.67	0.38	34.9
3	R2	All MCs	228	5.0	228	5.0	0.853	33.7	LOS C	17.8	129.9	0.38	0.67	0.38	34.1
Approach			253	5.0	253	5.0	0.853	31.9	LOS C	17.8	129.9	0.38	0.67	0.38	33.9
East: Rothery Street															
4	L2	All MCs	179	5.0	179	5.0	0.100	5.6	LOS A	0.0	0.0	0.00	0.57	0.00	50.4
5	T1	All MCs	166	5.0	166	5.0	0.114	0.0	LOS A	0.3	1.8	0.13	0.15	0.13	57.2
6	R2	All MCs	29	5.0	29	5.0	0.114	7.7	LOS A	0.3	1.8	0.13	0.15	0.13	54.3
Approach			375	5.0	375	5.0	0.114	3.3	NA	0.3	1.8	0.07	0.35	0.07	52.9
North: Wilga Street															
7	L2	All MCs	155	5.0	155	5.0	0.237	9.3	LOS A	1.1	7.7	0.19	0.88	0.19	46.5
8	T1	All MCs	8	5.0	8	5.0	0.237	18.4	LOS B	1.1	7.7	0.19	0.88	0.19	47.5
9	R2	All MCs	34	5.0	34	5.0	0.237	15.7	LOS B	1.1	7.7	0.19	0.88	0.19	42.6
Approach			197	5.0	197	5.0	0.237	10.8	LOS A	1.1	7.7	0.19	0.88	0.19	46.0
West: Rothery Street															
10	L2	All MCs	7	5.0	7	5.0	0.021	5.6	LOS A	0.0	0.0	0.00	0.11	0.00	53.2
11	T1	All MCs	191	5.0	191	5.0	0.106	0.1	LOS A	0.2	1.6	0.12	0.15	0.12	57.5
12	R2	All MCs	21	5.0	21	5.0	0.106	9.9	LOS A	0.2	1.6	0.14	0.16	0.14	52.9
Approach			219	5.0	219	5.0	0.106	1.3	NA	0.2	1.6	0.11	0.15	0.11	56.8
All Vehicles			1043	5.0	1043	5.0	0.853	11.2	NA	17.8	129.9	0.18	0.49	0.18	44.9

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