Structural
Civil
Traffic
Façade

Transport and Accessibility Impact Assessment

The Sutherland Hospital Operating Theatre Upgrade Project

Prepared for Health Infrastructure NSW
18 March 2021

Taylor Thomson Whitting (NSW) Pty Ltd (ACN 113 578 377)
as trustee for the Taylor Thomson Whitting NSW Trust
(ABN 59 514 956 558) I Consulting Engineers
Level 3, 48 Chandos Street, St Leonards NSW 2065

Your Partner in Engineering

Contents

List of Figures

List of Tables

Revision Register

Rev	Date	Remarks	Prepared By	Reviewed By	Approved By
0	15/11/2020	Draft	S. Ali	P. Yannoulatos	-
0.1	22/01/2021	Final draft	M. Babbage	P. Yannoulatos	-
1	01/03/2021	Issue for SSDA	M. Babbage	P. Yannoulatos	P. Yannoulatos
1.1	18/03/2021	Revised issue for SSDA	M. Babbage	P. Yannoulatos	P. Yannoulatos

Document Control

Internal reference	181387
File path	\\ttw\dfs\jobfiles\2018\1813\181387\Reports\TTW\Traffic\Report\5 - SSDA\1-TIA\210318 TSHOTUP Transport and Accessibility Impact Assessment Rev 1.1.docx

Prepared by	Reviewed by	Authorised By
		
MICHAEL BABBAGE	**PAUL YANNOULATOS**	**PAUL YANNOULATOS**
Senior Traffic Engineer	Technical Director	Technical Director

TAYLOR THOMSON WHITTING (NSW) PTY LTD
in its capacity as trustee for the
TAYLOR THOMSON WHITTING NSW TRUST

1 Introduction

1.1 Background

Taylor Thomson Whitting (TTW) has been engaged by CBRE Project Management for NSW Health Infrastructure (HI) to provide traffic engineering consultancy service for The Sutherland Hospital Operating Theatre Upgrade Project (TSHOTUP). The project design is being undertaken by HDR (architect).

This report provides an overview of the existing conditions and assesses the impact of the proposed development on the surrounding traffic environment. This report also assesses the adequacy of the proposed development within the context of various standards and legislation, both those that apply directly to the site and those which may form part of a broader or regional context to all types of development.

1.2 Scope

The Sutherland Hospital (TSH) is a 375-bed metropolitan hospital in the Sutherland Shire (Council) in Sydney, and part of the South East Sydney Local Health District (SESLHD).

As part of the Stage 1 Redevelopment of the Sutherland Hospital, a new Emergency Medical Unit, General Surgical Unit and Critical Care Medicine Unit became operational in 2017.

In February 2019, the Minister for Health and Medical Research announced an investment of $81.5 million to redevelop The Sutherland Hospital operating theatre complex.

The proposed redevelopment of the operating theatre complex would be a combination of new build and refurbishment, including the following:

- The number of operating theatres will increase from 5 to 8 as well as the endoscopy suites increasing from 1 to 2, resulting in a total of 10 spaces with associated clinic rooms.
- Supporting spaces including recovery, day surgery, storage, staff amenities and other clinical and non-clinical support spaces.
- A new Central Sterilising Service Department (CSSD) will be built immediately above the operating theatres.
- A new MRI suite will be built immediately below the operating theatres.

1.3 References

This report has been prepared in the context of and with knowledge of relevant documents as follows:

- The Sutherland Hospital - Operating Theatre Upgrade Project – Master Plan Report (HDR, January 2020)
- The Sutherland Hospital SSD Traffic and Parking Assessment (Arup, April 2015)
- The Sutherland Hospital Operating Theatre Upgrade Project, Workforce Plan (SESLHD, June 2020)
- Boom gate and staff parking permit data from November 2019, supplied by the Hospital
- Parking demand surveys (Matrix, 23 July 2020)
- Australian Bureau of Statistics 2016 Journey to Work Data.

Additional documentation reviewed from relevant local jurisdictions and similar nearby developments includes:

- Sutherland Development Control Plan (DCP) 2015 Chapter *36 Roads, Vehicular Access, Traffic, Parking and Bicycles*
- Sutherland Shire Local Environmental Plan (LEP)2015
- Sutherland Shire Council Integrated Transport Strategy (ITS), June 2020.

2 Response to Sears

Under application number SSD-11099584 we have been provided with Secretary's Environmental Assessment Requirements (SEARs). These requirements were issued on 10 December 2020. The key issues relevant to a Transport and Accessibility Impact Assessment include those shown in Table 2.1 and have been addressed in various sections of this report as referenced.

Table 2.1: Response to SEARs

Key issues		Comments and references
6	**Transport and Accessibility**	
	Include a transport and accessibility impact assessment, which includes, but is not limited to the following:	
6.1	Analysis of the existing transport network, including:	
	• Road hierarchy	*Section 3.2 – Road Network*
	• Pedestrian, cycle and public transport infrastructure	*Section 3.6 – Public Transport* *Section 3.7 – Active Transport*
	• Details of current daily and peak hour vehicle movements based on traffic surveys and / or existing traffic studies relevant to the locality	*Section 3.10 – Traffic Conditions*
	• Existing performance levels of nearby intersections utilising appropriate traffic modelling methods (such as SIDRA network modelling).	*Section 3.10 – Traffic Conditions*
6.2	Details of the proposed development, including:	
	• A map of the proposed access which identifies public roads, bus routes, footpaths and cycleways	*Section 4.1 – Site Access*
	• Vehicular access arrangements, including for service and emergency vehicles and loading/unloading, including swept path analysis demonstrating the largest design vehicle entering and leaving the site and moving in each direction through intersections along the proposed transport routes	*Section 4.1 – Site Access*
	• Car parking, bicycle parking and end-of-trip facilities	*Section 5 – Car Parking*
	• Drop-off / pick-up zone(s)/arrangements	*Section 4.5 – Drop-off and Pick-up Facilities*
	• Pedestrian or road infrastructure improvements or safety measures.	*Section 4.2 – Active Transport*
6.3	Analysis of the impacts due to the operation of the proposed development, including:	
	• Proposed modal split for all users of the development including vehicle, pedestrian, cyclist, public transport and other sustainable travel modes	*Section 6 – Traffic Analysis*
	• Estimated total daily and peak hour vehicular trip generation	*Section 6.1 – Trip Generation*

Key issues		Comments and references

	• A clear explanation and justification of the:
	  ○ Assumed growth rate applied
	  ○ Volume and distribution of proposed trips to be generated
	  ○ Type and frequency of design vehicles accessing the site.
		Section 6.1 – Trip Generation
		Section 6.2 – Traffic Growth
		Section 6.3 – Trip Distribution

	• Details of the performance of nearby intersections with the additional traffic generated by the development both at the commencement of operation and in a 10-year time period (using SIDRA network modelling)	*Section 6.4 – Future Traffic Conditions*
	• Cumulative traffic impacts from any surrounding approved development(s).	*Section 6.4 – Future Traffic Conditions*
	• Adequacy of pedestrian, bicycle and public transport infrastructure to accommodate the development	*Section 4.2 – Active Transport* *Section 6.1 – Trip Generation*
	• Adequacy of the car parking and bicycle parking provisions when assessed against the relevant car / bicycle parking codes and standards	*Section 5.3 – Adequacy of Parking Supply*
	• Adequacy of the drop-off / pick-up zone(s), including assessment of any related queuing during peak-hour access	*Section 4.5 – Drop-off and Pick-up Facilities*
	• Adequacy of the existing / proposed pedestrian infrastructure to enable convenient and safe access to and from the site for all users.	*Section 4.2 – Active Transport*
6.4	Measures to ameliorate any adverse traffic and transport impacts due to the development based on the above analysis, including:	
	• Travel demand management measures to encourage sustainable transport (such as a Green Travel Plan and / or specific Workplace Travel Plan)	*Refer to Green Travel Plan*
	• Infrastructure improvements, including details of timing and method of delivery.	*Nil required.*
6.5	A preliminary operational traffic and access management plan	*Refer to Operational Traffic and Access Management Plan.*
6.6	Analysis of the impacts of the traffic generated during construction of the proposed development, including:	*Refer to Construction Traffic and Pedestrian Management Plan.*
	• Construction vehicle routes, types and volumes	
	• Construction program (duration and milestones)	
	• On-site car parking and access arrangements for construction, emergency and construction worker vehicles	

Key issues		Comments and references
	• Cumulative impacts associated with other construction activities in the locality (if any)	
	• Road safety at identified intersections near the site due to conflicts between construction vehicles and existing traffic in the locality	
	• Measures to mitigate impacts, including to ensure the safety of pedestrians and cyclists during construction.	
6.7	A preliminary Construction Traffic and Pedestrian Management Plan.	*Refer to Construction Traffic and Pedestrian Management Plan.*

3 Existing Conditions

3.1 Site Location

The subject site is located at 126 Kareena Road, Caringbah. The parcel of land is designated as Lot 1 in DP 119519 and DP 432283. The extent of this lot is illustrated in Figure 3.1.

The land is currently occupied by the existing Sutherland Hospital. Other land uses in the surrounding area are predominantly residential with following key land uses in the immediate vicinity of the site:

- Kareena Private Hospital
- Lavida Medical Centre
- Sutherland Nuclear Medicine and Bone Densitometry Facility.

The site is located to the south-east corner of the intersection of Kingsway, Kareena Road and Port Hacking Road within the LGA of Sutherland Shire Council. The site has vehicular access via Kingsway to the north and Kareena Road to the west.

The site location and surrounding environs are shown in Figure 3.1.

Figure 3.1: Site location and environs

Basemap source: Sixmaps

The site is zoned as SP1 (Special Activities) under the Sutherland Shire Local Environmental Plan (LEP)2015. Figure 3.2 illustrates the various land uses in the surrounding area, as specified in the Sutherland Shire LEP 2015.

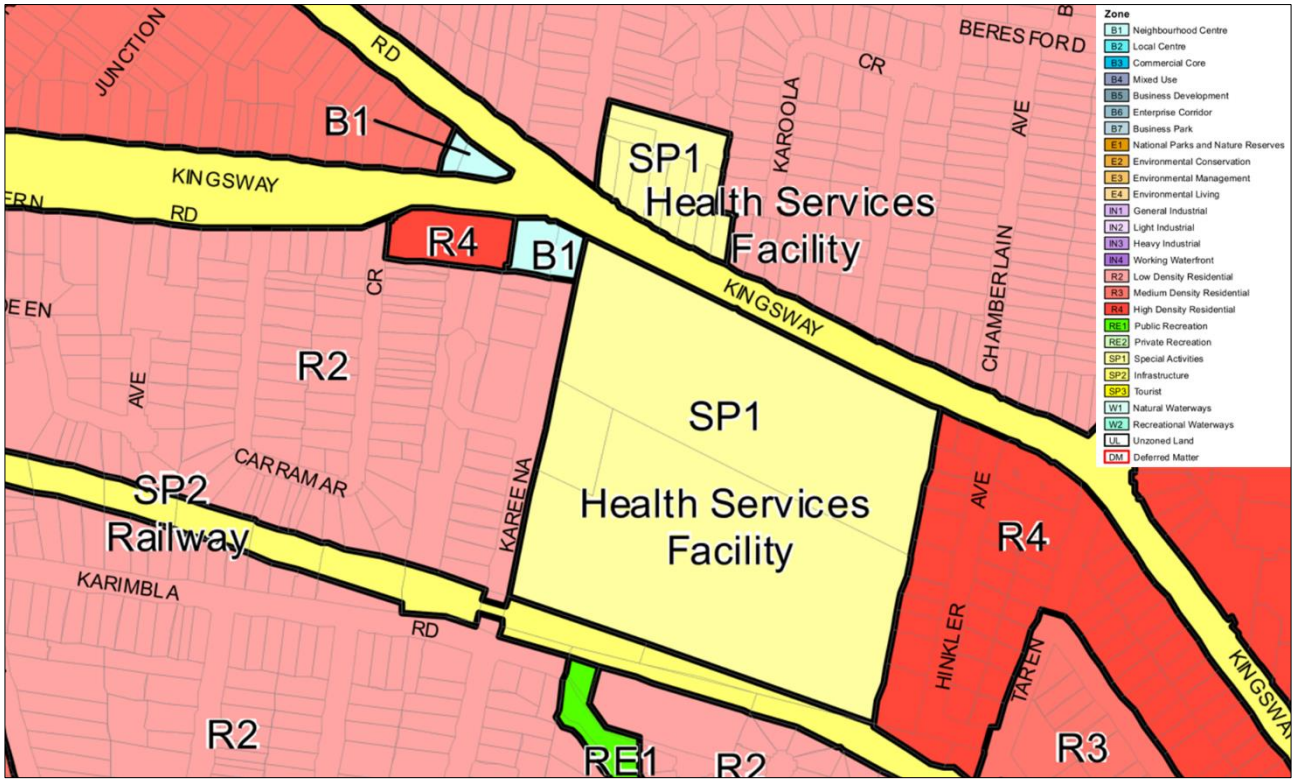


Figure 3.2: Site zoning

Image source: Sutherland Shire Local Environmental Plan 2015, Sheet LZN_006 (dated 19 June 2020)

3.2 Road Network

The site has frontages with Kingsway to the north and Kareena Road to the west. Taren Point Road is located to the northeast of the site and forms intersection with Kingsway. The intersection of Port Hacking Road, Kingsway and Kareena Road serves as a major traffic distributor in the vicinity of the site.

Kingsway is a state road with three travelling lanes in each direction. A median is provided to separate the travelling lanes. The sign-posted speed limit is 70 km/hr. The road is a major arterial road that intersects with Princes Highway to the west and Port Hacking road to the north-west. Kingsway provides direct vehicular access to the site, that serves the vehicles travelling in westbound direction only.

Kareena Road is a local road with one travelling lane in each direction. The sign-posted speed limit is 50 km/h. Parking is generally permitted on both sides of the road, however, adjacent to the site parking is only permitted on the western side of the road subject to various time restrictions (allowing an additional travel lane during peak hours). The road primarily serves the residential properties and the site and acts as a connection through to President Avenue to the south. The road provides two direct access to the site. The northern access via Kareena Road permits left turn only, whereas the southern access is via a roundabout controlled intersection generally used by ambulances and staff.

Taren Point Road is a state road with three travelling lanes in each direction. A median is provided to separate the travelling lanes. The sign-posted speed limit is 70 km/hr. The road provides a connection between Kingsway towards the suburbs of Sans Souci, Brighton-Le-Sands, and Rockdale.

3.3 Site Access and Vehicle Circulation

There are three main access points to the site. General traffic can enter and exit the site via the Kingsway (westbound only), Kareena Road northern access (southbound only), and Kareena Road southern access (all directions). All loading activity occurs via the Kareena Road southern access, which is near the internal loading

dock. Ambulances can approach the site from all access points, however, the emergency department is located closest to the Kareena Road northern access.

The ring road around the site allows vehicle access to all areas and facilitates movements such as ambulances between the emergency department and the ambulance station, and movements between parking modules. The ring road is partially disconnected at the CP6 car park in the north-east of the site (as illustrated in Figure 3.3 below) as this car park is boom gate controlled.

All movements within site can be facilitated without a return to the external road network.

Figure 3.3 shows the existing on-site vehicle circulation and access pattern to the site.

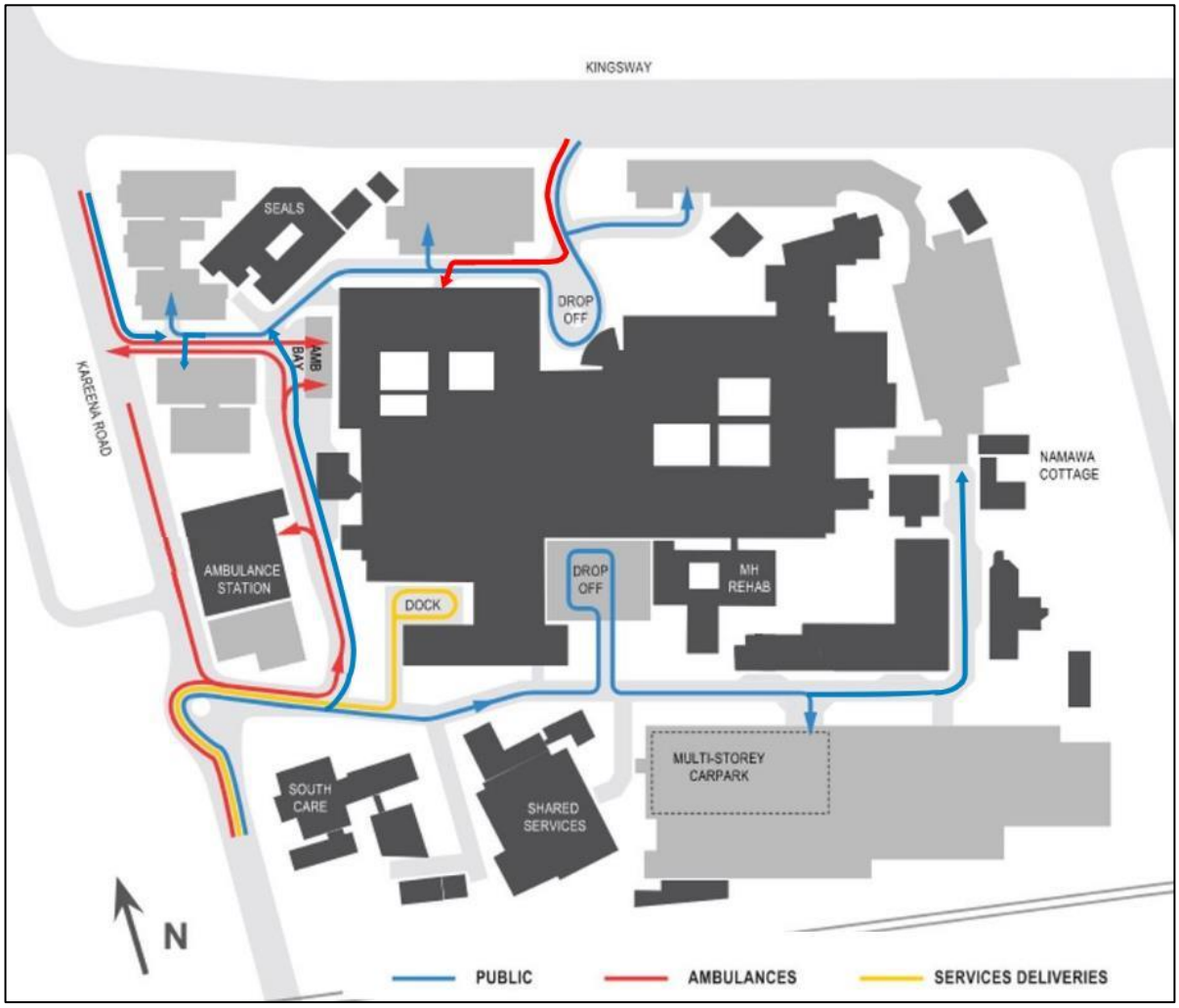


Figure 3.3: Existing on-site vehicle circulation

Source: Modified from Master Plan Report by HDR, January 2020

The current site access points have been modified in various ways throughout the history of the Hospital. Access points roughly resembling the current arrangement have been in place since at least 2003 (based on the earliest Google Earth imagery available).

In 2005, the Kareena Road northern access point was moved slightly south from its earlier location to its current location. At this time, the central median was also constructed, preventing right turns into the site. This was initially provided as a concrete median in front of the driveway only and line marked through to the intersection, with the concrete median being extended the full length at the end of 2010. Around the end of 2017, the median in front of the driveway was removed to facilitate movements into the site, during the construction of the Stage 1 redevelopment. However, the full length of the median had been reinstated by August 2018. The background of this reinstatement is unknown.

The roundabout at the Kareena Road southern access was constructed between 2003 and 2005, replacing an earlier T-intersection arrangement.

3.4 Infrastructure Upgrade Works

For the purpose of design development and business case assessment, HI has separated the Operating Theatre Upgrade Project in two separate design packages namely the Main Works for the Operating Theatre Upgrades, and the Infrastructure Upgrade Works which will support the overall development works at TSH.

The Infrastructure Upgrade Works package includes the following:

- Temporary road closure between Emergency Department and NSW Ambulance station to facilitate the upgrade works to the existing drainage infrastructure.
- Road works including widening of the southbound carriageway of Kareena Road to create a north-bound right turn traffic lane. The proposed right turn lane would facilitate northbound traffic accessing TSH via Kareena Road.

The proposed road and adjacent crossover design are shown in Figure 3.4 below. The design can facilitate the movements of the design vehicle, i.e. Bariatric Ambulance (6.95m x 1.99m) without crossing into oncoming traffic lane.

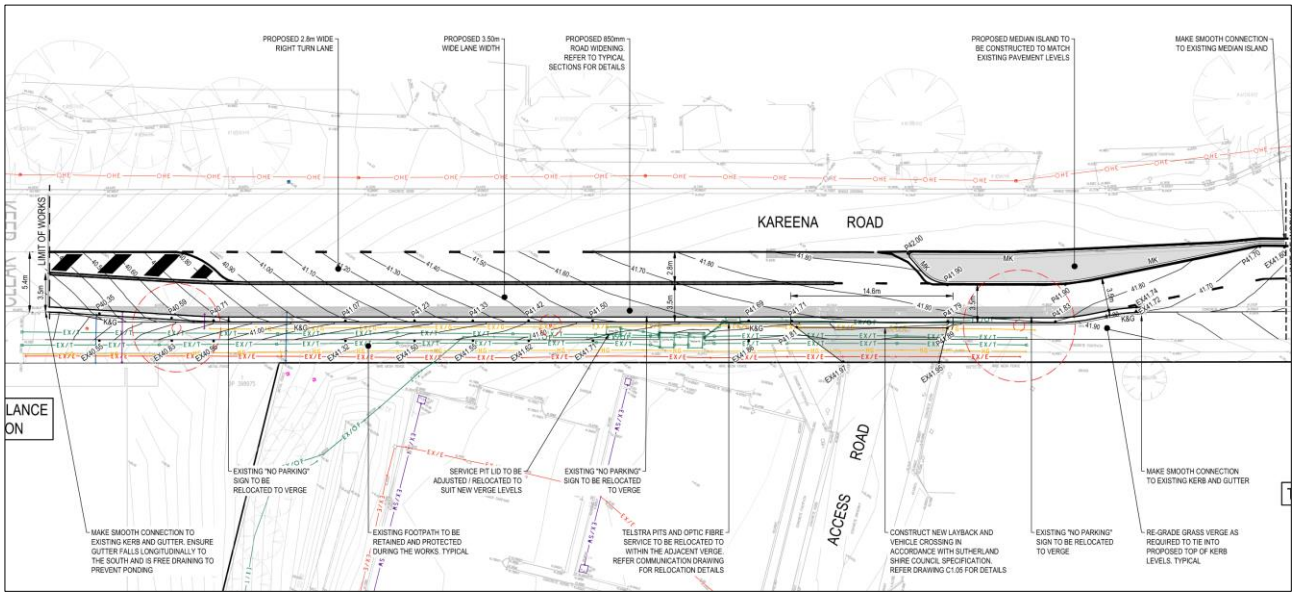


Figure 3.4: Proposed upgrades to Kareena Road

3.5 Traffic Volumes

Traffic movements into/out of the site were observed between 6:00am – 9:00am and 3:00pm – 6:00pm on Thursday 29 October 2020. These times were selected as they relate to the general peak traffic generation periods of the existing Hospital development.

The results indicated that the existing use of the site generates 347 trips (225 in, 122 out) during the morning peak (8:00am – 9:00am) and 442 trips (102 in, 340 out) in the afternoon peak (4:30pm – 5:30pm).

Geographical distribution of traffic is approximately 10% to the northeast (Kingsway access), 25% to the north (Kareena Road), and 65% to the south (Kareena Road).

The detailed traffic survey results are appended in Appendix A of this report.

3.6 Public Transport

3.6.1 Buses

At least four major bus routes service the site. The nearest bus stops are located on Kingsway adjacent to the Hospital entrance and at Kareena Road approx. 50 metres south of the intersection approach.

Route 477 operates between Rockdale and Miranda train station with a frequency of approximately 30 minutes throughout the day.

Route 478 is an express route which operates between 9:00 am and 4:00 pm, with a frequency of one hour.

Routes 977 and 978 operate between Miranda and Caringbah train station with an approximate frequency of 45 minutes.

The bus routes stop at the bus stop on Kingsway directly opposite to the Hospital. The bus services also connect the site to Miranda station to the west and Caringbah station to the east. Figure 3.5 shows a map outlining the bus routes available in the vicinity of the site.

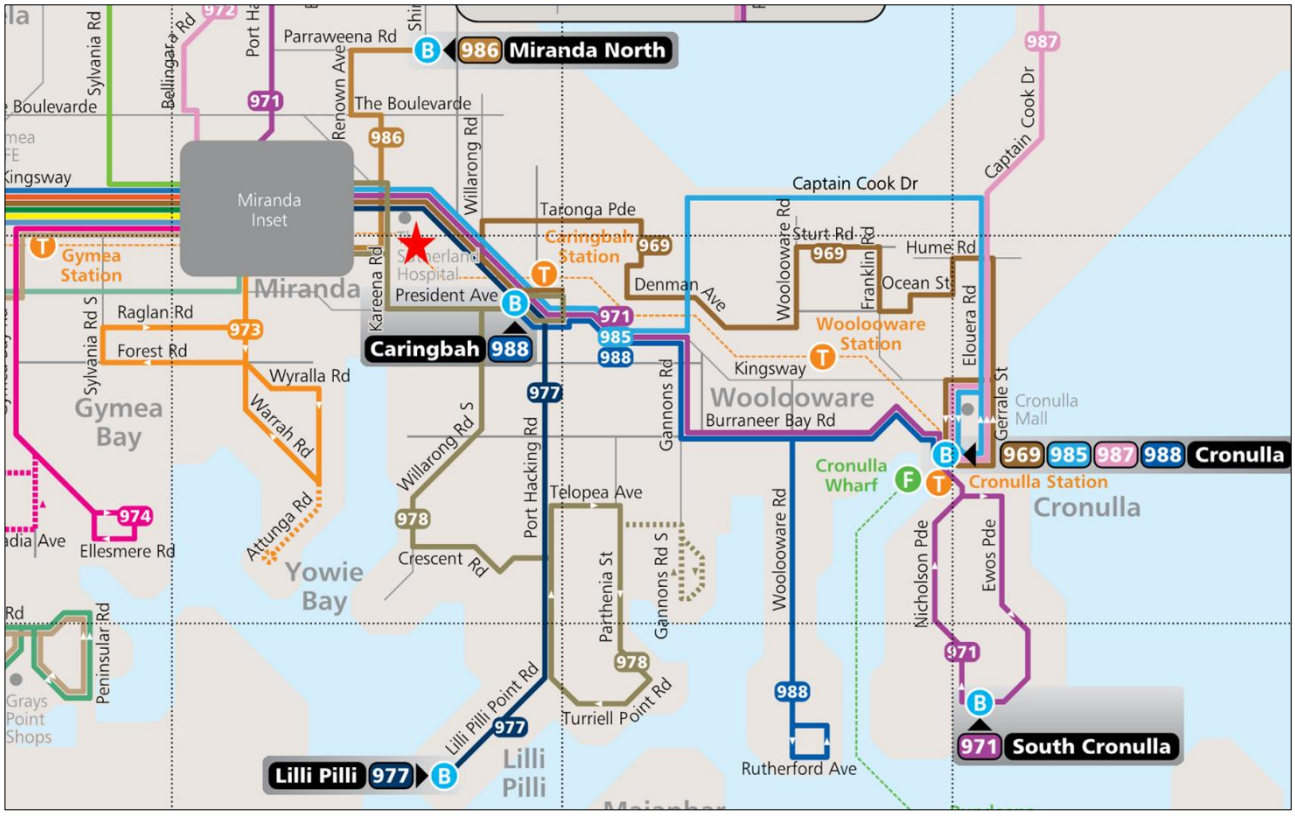


Figure 3.5: Bus routes map

Source: Transdev

3.6.2 Trains

The site is located approximately 500 metres west of the Caringbah train station and one kilometre east of Miranda train station. Both the stations are served by T4 train line which runs at 15-minute intervals during peak hours.

3.7 Active Transport

3.7.1 Pedestrian Facilities

The site is well connected with a broader network of pedestrian footpaths. Signalised pedestrian crossings are available on all approaches of the intersection at Kingsway/Kareena Road. The signalised crossing on the eastern and southern legs of the intersection provides direct pedestrian access to the site.

The bus stops on Kingsway adjacent to the Hospital access is provided with seats and accessible path.

3.7.2 Cycling Facilities

There are no dedicated cycleways available in the vicinity of the site. In the vicinity of the site, cyclists generally ride on roadways and footpaths throughout the local area.

The existing end of trip consists of a small amount of on-site bicycle parking provided adjacent to the main entrance and dialysis unit. The hospital provides staff male and female changing rooms including showers and lockers.

3.8 Travel Modes

3.8.1 Staff Travel Pattern Survey

A travel survey was undertaken by TTW to understand the existing travel characteristics of the site users. In total, 163 staff members out of total 241 staff members responded to the survey. Table 3.1 outlines the travel characteristics of the Hospital staff, based on the survey outcomes. These statistics are considered to be approximately reflective of the current travel habits of site users.

Table 3.1: Existing travel characteristics

Travel mode	Mode share (%)
Private vehicle	83.5%
Public transport	0.5%
Walking	4%
Cycling	6%
Other modes	6%

The staff survey indicates that 84% of staff travels to and from the Hospital by private vehicles. 10% of the staff use active travel options.

3.8.2 Journey to Work

The 2016 Journey to Work (JTW) data[1] provides an estimate of employee travel modes into and out of the local areas defined by Statistical Area Level 2 (SA2) region. The site is located within 'Caringbah' SA2.

An assessment of travel mode share (from the Australian Bureau of Statistics (ABS) 2016 JTW Data) is shown in Table 3.2 below. Method of Travel (MTW15P) categorisation of travel modes (as listed in the left column) is

[1] Australian Bureau of Statistics, 2016 Census of Population and Housing

used for a clearer and simpler assessment of key travel modes through the allocation of a primary mode when multiple modes have been used in one trip.

A summary of key mode categories is also provided in Table 3.3[2]. The JTW data is generally consistent with the staff survey outcomes and identifies that the majority of Hospital staff travel to the site via car. However, based on the staff survey, the active travel trend among the Hospital staff is found slightly higher than the overall active travel trend in the area.

Table 3.2: Journey to work data

Travel mode (MTW15P)	Mode share (%)
Train	5.5%
Bus	1.2%
Ferry	0.04%
Tram	0.03%
Taxi	0.19%
Car as driver	82%
Car as passenger	5.6%
Truck	0.61%
Motorbike	0.47%
Bicycle	0.70%
Walked only	3.2%
Other mode	0.36%
Total	**100%**

Table 3.3: Journey to work summary

Mode summary	Mode share (%)
Private vehicle (car, taxi, truck, motorbike)	88.7%
Public transport (train, bus, ferry, tram)	6.8%
Active transport (bicycle, walking)	4.4%
Total	**100%**

3.9 Car Parking

3.9.1 Off-Street Parking Supply

There are approximately 950 formal parking spaces within the existing Hospital campus. The capacity includes a combination of a multi-storey car park, at-grade car parks, fleet car park and on-street car parking within the overall campus. On 23rd July 2020, TTW has undertaken a parking capacity and demand survey at the TSH. The survey covered 853 parking spaces provided within the boom-gate controlled parking areas combined with 20 other parking spaces located adjacent to controlled parking areas (subject to various restrictions).

The remaining parking supply dedicated for other uses such as Southcare fleet cars, childcare and drop-off parking to the Sutherland Heart Clinic was not included in the survey, as they are not directly related to Hospital usage and serve separate functions.

[2] Mode share table excludes responses for “worked at home”, “did not go to work”, and “mode not stated”, and excludes categories with zero responses.

Therefore, the overall off-street parking inventory available to the staff, visitors and some special uses is assumed to be 873 spaces.

The breakdown of these spaces is as follows:

- 700 spaces for staff/ visitor use (some time-restricted)
- 19 disabled spaces
- 134 spaces for staff only allocated in Car Park 6
- 9 spaces reserved for special uses (ambulances, police, patient transport, security and maintenance etc.)
- 11 spaces for motorbikes.

Figure 3.6 shows the distribution of existing parking areas included in the parking survey.

Figure 3.6: Existing parking layout

Basemap Source: Nearmap

3.9.2 On-Street Parking Supply

On-street parking subject to some timing restrictions is available on all the roads surrounding the Hospital. Based on the parking capacity and demand survey, there are approximately 150 parking spaces available within 300 metres radius of the Hospital. The extent of on-street parking provision considered in the survey is detailed in Appendix B of this report.

The breakdown of these spaces are as follows:

- 62 spaces on Port Hacking Road
- 55 spaces on Kingsway
- 33 spaces on Kareena Road.

3.9.3 Parking Demand Based on the Parking Survey

Parking demand surveys were completed throughout on 23 July 2020 between 6:00am and 6:00pm to ensure all peak demand periods were adequately identified.

The results of these parking demand surveys are summarised in Table 3.4 and shown graphically in Figure 3.7. Full results are provided in Appendix B of this report.

Table 3.4: Existing off-street car parking demand

Time	Parking Type					Total
	General	Disabled	Staff Only	Special uses	Motor Bike	
Supply	*700*	*19*	*134*	*9*	*11*	*873*
6:00	166	2	32	2	4	**206**
7:00	228	3	41	2	4	**278**
8:00	451	5	50	2	4	**512**
9:00	506	8	100	3	4	**621**
10:00	571	9	98	3	4	**685**
11:00	611	8	107	3	4	**733**
12:00	602	6	114	2	4	**728**
13:00	590	8	110	2	4	**714**
14:00	587	10	107	3	4	**711**
15:00	582	10	81	2	4	**679**
16:00	413	7	83	2	3	**508**
17:00	340	6	79	3	2	**430**
18:00	264	4	63	1	1	**333**
Occupancy at peak demand	87%	42%	80%	33%	36%	**84%**
Vacancy at peak demand	**89**	**11**	**27**	**6**	**7**	**140**

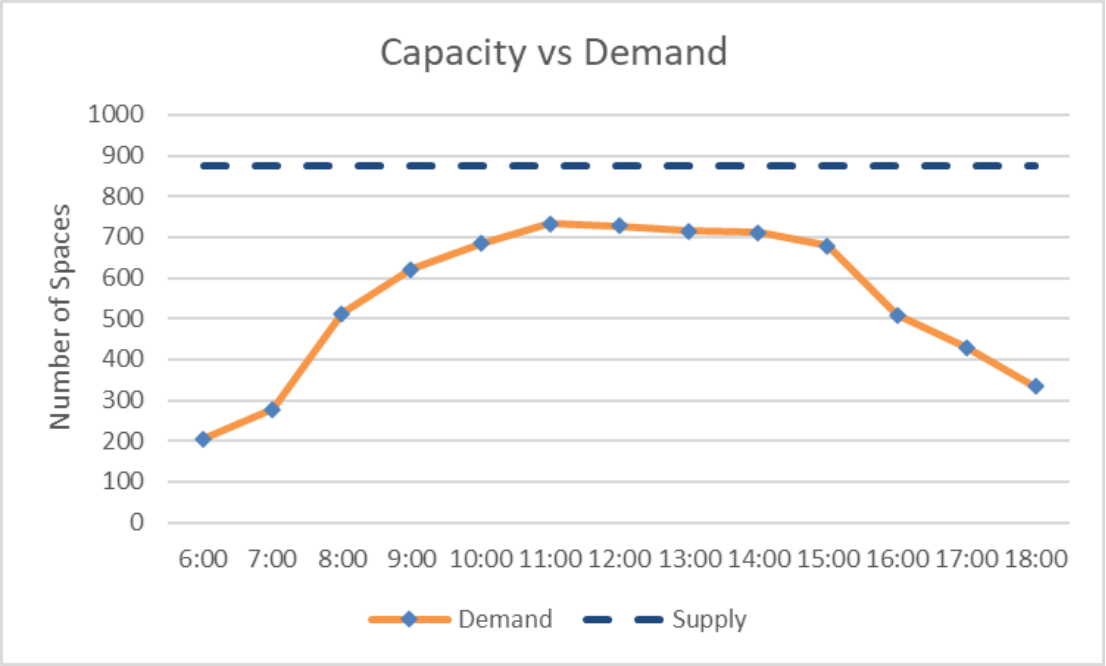


Figure 3.7: Existing off-street parking demand based on the parking survey

The parking demand survey concluded that the Hospital generally experiences peak parking demand during the middle of the day. Similar high demand generally remains until 3:00pm when day shift staff begin to leave.

Peak parking demand across the surveyed parking areas occurred at 11:00am with 84% occupancy (733 spaces). It is also noted that the 27 spaces from staff only (20% of staff only parking supply) and 89 spaces from staff and visitor uses (13% of general parking supply) remain vacant during the peak demand period.

In addition to the formal car parking demand surveys, the following observations were made of the on-street parking occupancy surveys:

- The survey outcomes indicate that the unrestricted parking at Port Hacking Road almost remains 80% occupied throughout the day, whilst the occupancy drops down to 37% at 6:00pm. This shows that these unrestricted on-street parking spaces are used in a cycle where residents park at night, and generally Hospital staff use them from morning till evening.
- On-street parking on Kingsway between Junction Street and Port Hacking Road is unrestricted, which remains up to 80% occupied throughout the day.
- Time-restricted on-street parking on Kingsway is not heavily used during the daytime
- Un-restricted parking on Kareena Road remains near or at capacity from 6:00am in the morning till 3:00pm.
- Time-restricted parking on Kareena Road (adjacent to the Hospital) remains near to capacity.

Based on the above and noting that parking demand is generally contained within the Hospital and throughout the immediate surround, up to 841 (733 on-site and 108 on-street) vehicles associated with Hospital operations were parked during the busiest peak period.

3.9.4 Parking Demand Based on Boom Gate Data

Generally, parking demand surveys define existing parking demand of any development. As discussed in Section 2.3.3, a parking demand survey at the Hospital was completed on 23 July 2020. However, due to COVID-19, it was assumed that the surveyed results might show a reduced parking demand, which may not resemble the realistic parking demand of the Hospital from pre-COVID times.

In order to assess the pre-COVID parking demand, the Hospital has provided boom gate data obtained from its car park operator (Wilson). The boom gate data from Thursday, 7 November 2019 was processed by matching the ticket numbers from each car park.

The results of these parking demand surveys are summarised in Table 3.5 and shown graphically in Figure 3.8. Full results are provided in Appendix C of this report.

Table 3.5: Existing off-street parking demand based on boom gate data

Time	Parking Type					Total
	Car Park 1	Car Park 2	Car Park 3	Car Park 5	Car Park 6	
6:00	11	3	7	68	8	**97**
7:00	21	10	13	232	40	**316**
8:00	49	17	14	410	66	**556**
9:00	50	28	37	455	76	**646**
10:00	47	41	44	473	81	**686**
11:00	50	46	43	490	89	**718**
12:00	50	40	38	482	88	**698**
13:00	50	39	41	490	82	**702**
14:00	50	32	41	463	68	**654**
15:00	48	30	27	401	56	**562**
16:00	46	16	22	299	36	**419**
17:00	43	12	23	161	23	**262**
18:00	33	7	17	84	9	**150**
Peak Demand	100%	79%	98%	87%	64%	**84%**
Supply	**50**	**58**	**44**	**562**	**139**	**853**

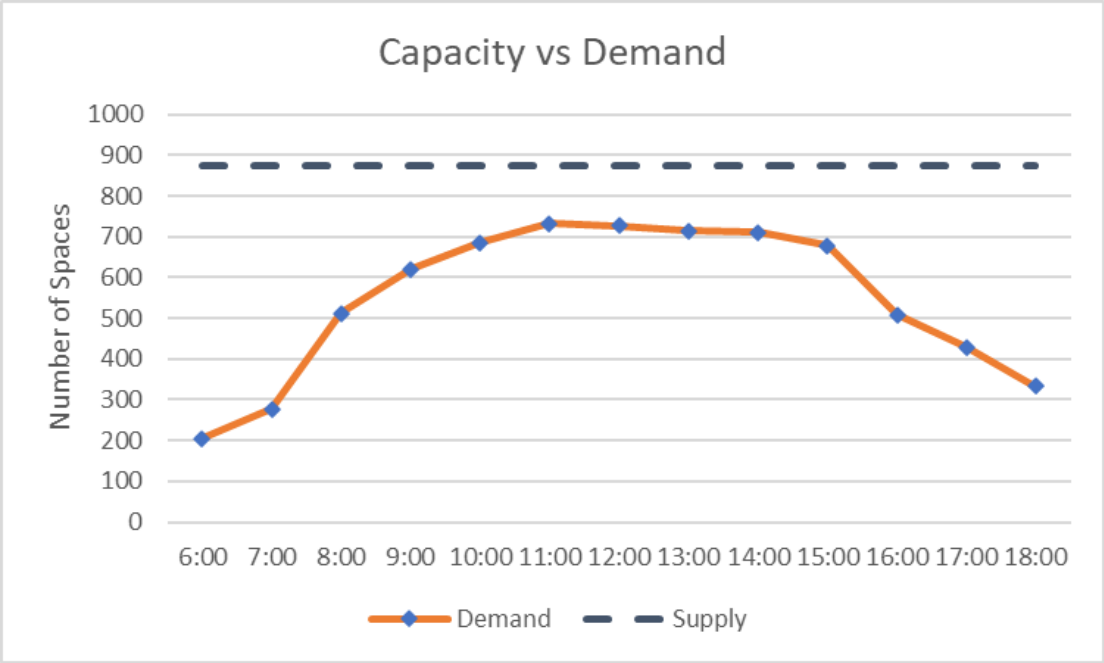


Figure 3.8: Existing off-street parking demand based on boom gate data

The boom gate data shows a parking occupancy trend similar to the trend observed through parking demand survey during COVID-19. It is noted that boom gate data did not distinguish between different type of parking

modules. Therefore, the data above is presented for each car park rather on the basis of parking type, as shown in Table 3.4. Furthermore, the capacity under the boom gate data is also reduced from 873 spaces to 853 spaces, since 20 additional spaces out of the boom gate-controlled car parks were only captured through parking occupancy survey.

The above results showed that the peak parking demand occurred at 11:00am with 84% occupancy, comprising 718 occupied spaces and 135 available spaces. This overall peak parking demand is similar to what observed through parking demand survey. However, a detailed comparison of both data set shows that the parking demand between each car park varies when compared between pre-COVID and during COVID situation. In fact, the parking demand during COVID situation is slightly higher by approx. 10 vehicles, which could have occurred due to limited public transport usage during the pandemic.

Based on the above, the overall parking demand of the Hospital remains similar between pre-COVID and during COVID situation. Therefore, the above assessment based on boom gate data is considered more relevant to form the basis of future parking demand outlined in Section 5 of this report.

3.10 Traffic Conditions

3.10.1 Traffic Volumes

Intersection traffic counts were undertaken on Thursday 29 October 2020. The counts were completed at the existing accesses to the Hospital including the roundabout intersection at Kareena Road (southern access off Kareena Road).

It was presumed that the traffic during COVID-19 would be significantly lower in comparison to the pre-COVID situation. However, based on the discussion above in section 3.8.4, during COVID, the car parking occupancy at the Hospital was noted to be slightly higher than normal days. In addition, at the time when these traffic surveys were conducted, a significant decline in local transmission of coronavirus was being reported. Based on that, it was assumed that the traffic survey results show a realistic reflection of pre-COVID traffic condition and is deemed suitable to be used for a post-development traffic assessment.

In the vicinity of the site, Port Hacking Road and Kingsway are major roads and form a signalised intersection to the north-west corner of the site. Due to COVID, it was assumed that a traffic survey at the main arterial roads leading to the signalised intersection is likely to show an unrealistic traffic trend. In order to avoid any discrepancy in the traffic data, SCATs based intersection traffic volumes from 7 November 2019 (pre-COVID times) were collected from Transport for NSW (TfNSW). The SCATs based traffic volumes combined with our site observations were then used to assess the existing intersection performance.

The AM and PM peak hours were found to occur from 8:00am to 9:00am and 4:30pm to 5:30pm respectively. Complete survey results are included in Appendix A of this report.

3.10.2 Intersection Operation

The intersection operation assessment of the nominated study intersection has been undertaken using SIDRA INTERSECTION (SIDRA) modelling software. TfNSW identifies vehicle delay as a commonly used measure to assess intersection performance.

Table 3.6 shows the criterion recommended by TfNSW and adopted by SIDRA software to assess the level of service.

Table 3.6: Level of service criteria for intersections

Source: TfNSW Guide to Traffic Generating Developments

Level of Service (LOS)	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required

D	43 to 56	Operating near capacity	Near capacity, accident study required
E	57 to 70	At capacity, at signals incidents will cause extensive delays Roundabouts require other control mode	At capacity, requires other control mode
F	Greater than 70	Additional capacity required	Extreme delay, additional capacity required

A summary of the existing intersection operation is shown in Table 3.7 with detailed modelling results attached in Appendix D. Based on the assessment, the signalised intersection of Kingsway/ Port Hacking Road/ Kareena Road operates satisfactorily in the morning and evening peak hours. The results indicate that the intersection operates near capacity, however, maintains as appropriate overall intersection operation (LOS C). The Kingsway and Port Hacking Road is an arterial road where signal support platooning with favourable arrival pattern on east, west and north-west approaches of the intersection, such that approximately 80% of the traffic volume on these approaches arrive at the start of the green period. This results in slightly higher delays on Kareena Road (north and south approach at the intersections) and right turn from east and north-west approaches of Kingsway and Port Hacking Road. This is a common phenomenon for intersections where local roads intersect with major roads.

The 95th percentile vehicle queue on all approaches are found to be contained within the existing approach length and do not intrude into adjacent intersection approaches.

The roundabout controlled intersection of Kareena Road / Southern Access to TSH operates at a satisfactory level of service. During the PM peak, the 95th percentile queue on the northern approach reaches up to 48 metres. This means at times the vehicle queue on this approach extends up to the adjacent NSW Ambulance Station. However, a keep clear area in front of the Ambulance Station access allows free flow movement for ambulances exiting the station.

Table 3.7: Summary of existing intersection operation conditions

Results for signalised intersection are the average of all movements on each approach.
Results for unsignalised intersections are for the movement with the highest delay on each approach.

Intersection	Peak	Leg	DOS	Avg Delay (sec)	95% Queue Length (m)	LOS
Kingsway/ Port Hacking Road/ Kareena Road	AM	South	0.79	41	64	C
		East	0.60	29	83	C
		North	0.64	54	47	D
		North West	0.77	42	54	C
		West	0.70	38	130	C
		Overall	**0.80**	**37**	**130**	**C**
	PM	South	0.86	39	63	C
		East	0.82	35	152	C
		North	0.62	54	81	D
		North West	0.90	43	88	C
		West	0.83	50	172	D
		Overall	**0.90**	**41**	**172**	**C**
Kareena Road / Southern Access Road	AM	South	0.43	10	22	A
		East	0.07	12	3	A
		North	0.40	11	18	A
		Overall	**0.43**	**12**	**22**	**A**
	PM	South	0.30	11	14	A
		East	0.43	24	28	A
		North	0.63	10	48	A
		Overall	**0.63**	**24**	**48**	**B**

4 Proposed Development

The proposal seeks consent for the construction of an upgraded Operating Theatre Facility and associated works, comprising:

- Eight Operating Rooms including 1 Hybrid
- Two Procedure Rooms
- Recovery Stage 1
- Short Stay Surgical Unit / Recovery Stage 2
- Recovery Stage 3 / Discharge Lounge
- Surgical Admissions
- Central Sterile Services Department (CSSD)
- MRI Suite.

The proposal includes an extension of the existing Hospital building to the west, which will result in a minor loss of 12 parking spaces from car park CP3. The proposed redevelopment would also disconnect a stretch of the internal loop road aligned in a north-south direction to the west of existing Hospital building, which would disrupt the existing access pattern to the site. In order to maintain the access to the overall site, an alternative right turn arrangement into the Hospital via northern access off Kareena Road has already been determined under a separate REF (see detailed discussion in section 4.1).

The proposal will be built across the existing internal access road, which will be made redundant with the new traffic circulation arrangement provided by the Infrastructure Upgrade Works (IUWs) on the site. These works have been described in Section 3.4 and will be undertaken prior to TSHOTUP. Therefore, there are no new or unresolved circulation impacts, or changes to access and circulation, as a result of the Operating Theatre Upgrade Project. The IUWs and REF works will include provision for right-hand turn facilities into the site from Kareena Road for public and ambulance vehicles. Pedestrian traffic and maintenance vehicles will be able to travel beneath the new building.

The project will increase operating theatre capacity to meet future demand driven by an increasing and ageing population with the associated increase in chronic and complex disease. Based on the workforce plan prepared by SESLHD[3], with the added patient capacity, the Hospital will also increase its full-time equivalent (FTE) staffing capacity in different phases. The proposed timeline considers the staged opening of the project in line with projected activity and allocated resourcing. Staffing levels shown in Table 4.1 are likely to be achieved in the corresponding phases.

Table 4.1: Future FTE staff projections

FTE	Project phases			
	Current	**Transition (2022)**	**Phase 1 (2023/36)**	**Phase 2 (2026/31)**
TSHOTUP staff (FTE) [3]	177	208	276	323
Net increase (FTE)	-	31	99	146
Stage increase (FTE)	-	31	68	47

4.1 Site Access

As discussed above, the proposed redevelopment will extend the footprint of the existing Hospital building to the west. The building extension will result in the closure of the internal roadway, which connects the northern and southern portion of the site and facilitates vehicles access to the emergency department and car parking areas located to the north of the site. Subsequently, an alternative right turn arrangement off Kareena Road northern access has been determined via a separate REF and would be constructed prior to commencement of construction works for the proposal. The newly constructed right turn treatment would provide access to the emergency department and surrounding car parks for the northbound traffic on Kareena Road.

[3] *TSHOTUP Workforce Plan June 2020 – T20/34590 – Indicative Staffing Profile*

Based on the above, Figure 4.1 shows the updated vehicular access pattern to the Hospital via Kareena Road. By the time of completion of the proposed redevelopment, below vehicular access pattern will already become a default access arrangement for the Hospital.

Therefore, all public and emergency vehicles access to the proposed development will be as per the existing conditions, through Kareena Road and Kingsway.

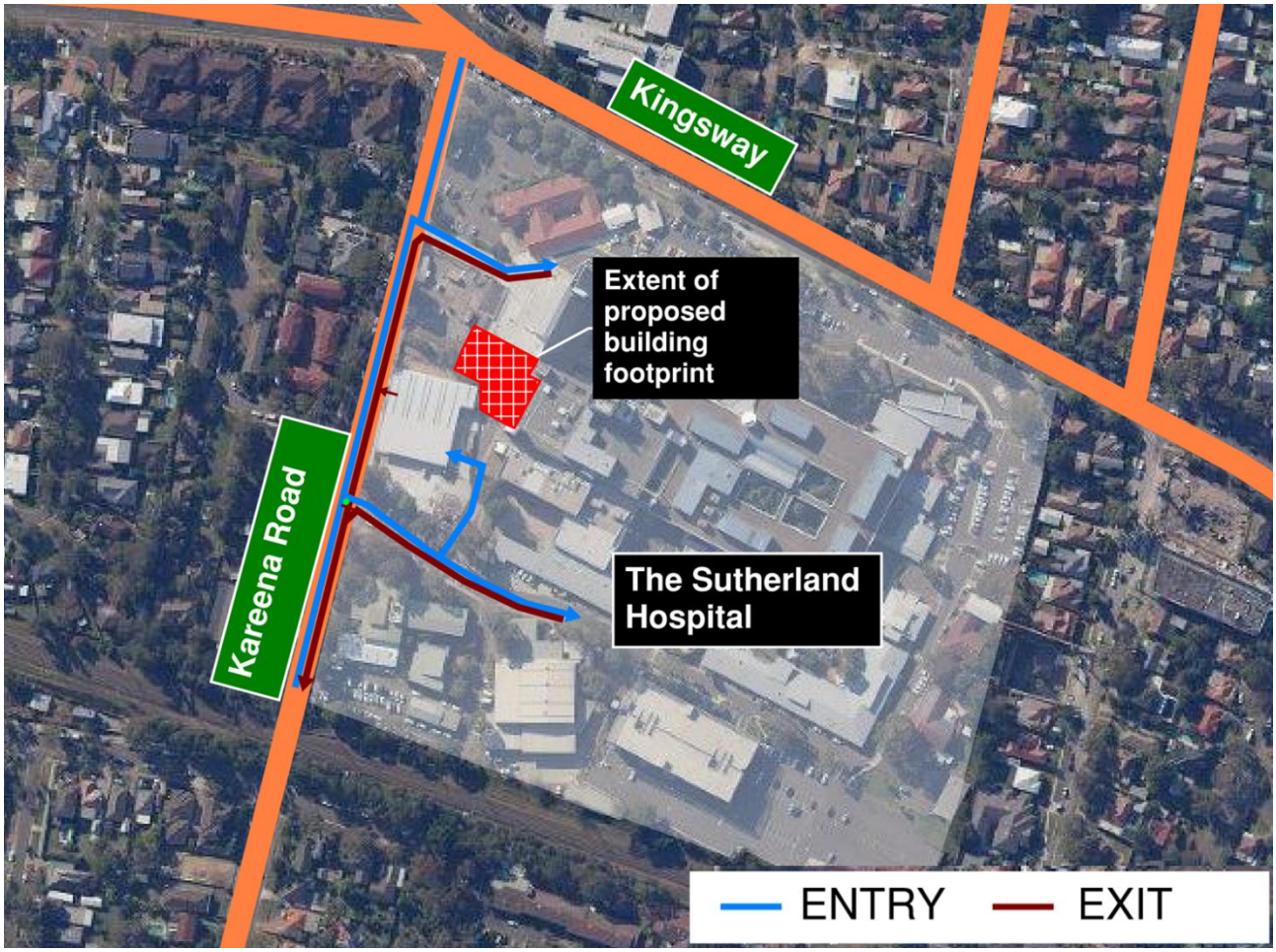


Figure 4.1: Proposed vehicular access to TSH

4.2 Active Transport

4.2.1 Pedestrian Movements

All existing infrastructure is to be retained (or reconstructed where necessary along the site frontage) and considered to be adequate for the future operation. Existing pedestrian footpaths provide a good amenity for users, as discussed previously in Section 3.7.1.

4.2.2 Cycling Facilities

The Sutherland Shire Development Control Plan (DCP) 2015 Chapter *36 Roads, Vehicular Access, Traffic, Parking and Bicycles* provides requirements for bicycle parking. The DCP specifies that "1 bicycle space per 10 car parking spaces for first 200 car spaces, then 1 space per 20 parking spaces thereafter. In addition, 1 unisex shower is required per 10 employees".

The proposed redevelopment of the existing operating theatre facility is primarily focused on to provision of improved health care to the community. The proposal does not provide any new vehicle parking spaces (see Section 5 for details on parking demand and provision). Based on that, the DCP parking requirements for bicycle parking spaces are not considered to apply to the proposal.

The proposed redevelopment scope incorporates additional bicycle parking adjacent the east car park, staff male and female changing rooms will be refurbished to provide a sufficient number of showers and lockers.

4.3 Public Transport

Hospitals experience limited demand for public transport services due to the nature of their requirements and operation (noting upwards of 85% vehicle mode split for staff and visitors). This is expected to remain consistent for the proposed development.

Notwithstanding the above, sustainable travel initiatives are proposed in Section 7, which are intended to improve the usage of active and public transport modes.

It is not proposed to modify any existing public transport infrastructure or services. The new built will be able to utilise the same pedestrian connections to existing public transport services as for the rest of the Hospital campus. The existing campus provides good connectivity to the bus stop located on Kingsway.

The Council's Integrated Transport Strategy (ITS) has been published in June 2020, which aims to increase the current public transport mode share of all daily trips taken across the LGA by 35% by 2030. In addition, as outlined in the ITS, the Council's strategic approach is to "*advocate for more convenient, efficient and reliable suburban bus services to and from Sutherland, Miranda, western part and the less accessible peninsula of the Shire including major activity generators such as Sutherland Hospital and ANSTO by 2023*". Based on the above, it is anticipated that public transport connectivity to and from the Hospital is likely to be improved significantly by the commencement of Phase 1 of the project. If additional infrastructure or services are introduced in the future, it is anticipated that the relevant agencies or service providers would consult with the Hospital as a major trip generator in the area. The Hospital and LHD would engage in consultation and strategies as required to encourage usage of any potential future public transport.

4.4 Service and Loading

Deliveries related to the proposed redevelopment will be received within the existing loading dock, which has sufficient capacity for additional deliveries.

4.5 Drop-off and Pick-up Facilities

It is understood that the proposed redevelopment would primarily improve the health care facility and does not intend to change the transport characteristics of the site. The proposed facility will form part of the core Hospital building and is likely to be facilitated through existing drop-off and pick-up facilities within the Hospital premises.

5 Car Parking

5.1 Local Guidelines

The Sutherland DCP 2015 Chapter *36 Roads, Vehicular Access, Traffic, Parking and Bicycles* provides parking rates for various categories of development. The parking controls related to the Health Service Facilities are as follows:

- Medical Centres
  - 1 space per 30m^2 (Zone B1, B2, B3, B4)
  - 1 space per 35m^2 (Caringbah Medical Precinct (R4))
- Health consulting rooms
  - 3 spaces per consultation room or surgery room.

The above defined parking requirements are related to the health facilities but not specifically to a Hospital. The proposed development forms part of the broader Hospital campus, therefore, the DCP parking requirements do not specifically apply on the redevelopment.

The RTA Guide to Traffic Generating Developments does not specify a car parking rate for public hospitals.

Apart from the relevant DCP controls, a site-specific assessment is generally considered to be more accurate than a standard rate, particularly for Hospital developments.

5.2 Forecast Demand

The existing parking demand survey combined with some assumptions are used to validate the calculations for the existing site and determine the expected future parking demand associated with the proposal.

Existing demand is calculated for the 2019/20 operational demands in the first column of Table 5.1 below. Validation of this data is discussed in Section 3.9. The demand study then forecasts parking demand for the Transition Phase (2022), Phase 1 (2023/26), and Phase 2 (2026/31). It is important to understand that these phases are based on the anticipated increase in workforce, whereas Phase 1 only coincides with the completion year of the project. A summary of additional parking demand associated with the proposed facility is outlined in

Table 5.2 below.

Note that staff demand is calculated based on the ‘busy period’ workforce values in order to capture peak parking demand.

Table 5.1: TSHOTUP parking demand calculations
Values may not add exactly due to rounding errors.

Category	Parameters	Existing (2019/20)	Transition (2022)	Phase 1 (2023/26)	Phase 2 (2026/31)
Staff	Total TSHOTUP staff (FTE)[4]	177	208	276	323
	Net increase (FTE)	-	31	99	146
	Total TSHOTUP staff (headcount)[5]	221	260	345	404
	Net increase (headcount)	-	39	124	183
	Percentage of staff during busy shift[6]	47%	47%	47%	47%
	Car usage rate[7]	83.5%	83.5%	83.5%	83.5%
	Total TSHOTUP staff demand	**87**	**102**	**135**	**158**
	Net increase in staff demand for each phase	-	**15**	**49**	**72**
Public	Total operating rooms / preparation rooms	5	8	8	10
	Total recovery beds	13	17	17	18
	Recovery beds generating parking[8]	7	9	9	9
	Car usage rate assumption	100%	100%	100%	100%
	Total public demand	**12**	**17**	**17**	**19**
	Net increase in public parking demand for each phase	-	**5**	**5**	**7**

Table 5.2: TSHOTUP parking demand summary
Values may not add exactly due to rounding errors.

Category	Existing (2019/20)	Transition (2022)	Phase 1 (2023/26)	Phase 2 (2026/31)
TSHOTUP staff demand	87	102	135	158
TSHOTUP public demand	12	17	17	19
Total TSHOTUP demand	**99**	**119**	**152**	**177**
Net increase	-	**20**	**54**	**79**
Staff %	88%	86%	89%	89%
Public %	12%	14%	11%	11%

5.3 Adequacy of Parking Supply

Based on the proposed development design, the building footprint would permanently eliminate up to 12 parking spaces from Car Park 3. In addition, during the construction stage, the contractor's shed would occupy up to 25 additional parking spaces from Car Park 3. Therefore, the overall car parking provision during the

[4] TSHOTUP Workforce Plan June 2020 – T20/34590 – Indicative Staffing Profile
[5] +25% FTE to Headcount conversion rate advised by client
[6] Busy shift percentage advised by client
[7] As per TTW surveys of existing staff – refer Section 3.8.1
[8] Assuming not all recovery patients would have an attendant waiting for the recovery period

construction would drop to 816 spaces. Upon completion of construction works, those 25 parking spaces will be reinstated, where the permanent parking provision would reduce to 841 spaces.

Given consideration to the changes in parking supply and demand, Table 5.3 outlines a summary of parking demand and supply under each phase of the project. Based on this, with the additional parking demand and reduced parking provision, there would still be a surplus during the ultimate peak activity period.

Table 5.3: Site parking demand and supply

Stage	2020 (Existing)	2021/22 (Construction / Transition)	2023/26 (Phase 1)	2026/31 (Phase 2)
Site supply[9]	853	816	841	841
Site demand	718	738	772	797
Surplus	**135**	**78**	**69**	**44**

Based on the above, the overall parking supply would cater for the increase in parking demand associated with the proposed redevelopment.

5.4 On-Street Parking

The redevelopment will result in no changes to the capacity of on-street parking.

The parking demand associated with the proposal (approximately 80-space increase) is able to be catered for within available off-street parking provision within the Hospital campus (135 vacant car spaces at peak demand). Therefore, no significant impact to on-street parking is anticipated due to the proposed redevelopment.

It is acknowledged that some users may choose to park on-street subject to availability and individual circumstances, however given the on-site availability this is not inherently required as a result of the development.

[9] *Within surveyed area; excludes some fleet and special functions*

6 Traffic Analysis

6.1 Trip Generation

The TfNSW *Guide to Traffic Generating Developments* provides a trip generation rate specifically for hospitals based on collected survey data throughout urban and regional NSW. For metropolitan and regional hospitals with lower accessibility, trip generation rates are therefore presented as follows:

$$AM\ Peak = 0.41(S) + 0.62(B)$$

$$PM\ Peak = 0.59(S) + 0.05(B)$$

Where S is the number of staff during day shift and B is the number of beds at the hospital.

Based on the above formula, the staff and bed numbers are key contributors in estimating traffic generation of hospital sites. It is anticipated that the staff and bed numbers at TSH will increase as the proposed redevelopment operation progresses. As discussed in Section 5.2, the increase in the number of staff and bed would occur in the following three phases:

- Transition Phase (2022)
- Phase 1 (2023/26)
- Phase 2 (2026/31)

It is important to understand that these phases are based on the anticipated increase in workforce, whereas Phase 1 only coincides with the completion year of the project. Table 6.1 shows the traffic generation associated with the additional number of staff and beds as anticipated in the year 2022, 2023 and 2026.

Table 6.1: Summary of generated trips

	Project phases			
	Current	**Transition (2022)**	**Phase 1 (2023/26)**	**Phase 2 (2026/31)**
TSHOTUP staff (headcount)	221	260	345	404
Net increase (headcount)	-	39	124	183
Number of beds	13	17	17	18
AM peak hour trips	99	117	152	177
PM peak hour trips	143	171	221	256
AM additional trips	-	**18**	**53**	**78**
PM additional trips	-	**28**	**78**	**113**

For the purposes of traffic modelling, the FTE increase has been rounded up for a worst-case estimate, resulting in additional peak trip generation of 82 trips and 118 trips in the AM and PM periods respectively, compared to calculations in the table above. Those worst-case values are used in the following sections of this report.

Due to the high proportion of private vehicle usage for the existing site, generation of trips by public and active transport is expected to be minor and shall result in negligible impacts to the local transport network.

6.2 Traffic Growth

To provide an accurate understanding of the future traffic conditions, intersection modelling has been undertaken for the year 2023 (opening year) and 2030 (horizon year when Phase 2 of staffing and number of beds will be completely operational) assuming 10 years of traffic growth beyond the current 2020 conditions. The forecast beyond this date is unlikely to provide accurate information due to uncertainties in the future of the area, long-term transport and road network changes, and changing behaviour of hospital users. Hospital operational forecast extends through to the year 2026/31, and this is considered suitable for the 10-year traffic forecasts.

Background traffic growth across the forecast period has been assumed at 2% per annum. While this is a typical factor for traffic growth, it is also a conservative representation of the population growth in the local area. Based on our experience, a traffic growth factor of 2% is expected to provide a high-end estimate of traffic growth in the area.

We note that background growth factors have only been applied to through movements along the Kingsway, Port Hacking and Kareena Road, as traffic volumes for Hospital movements are based on final operational values for staffing and beds (i.e. inclusive of growth).

6.3 Trip Distribution

Distribution of additional trips has been calculated based on the distribution of existing movements at the site entry, which is approximately 10% to the northeast (Kingsway access), 30% to the north (Kareena Road northern access), and 60% to the south (Kareena Road southern access).

Based on the traffic surveys, Table 6.2 outlines the anticipated per cent split of inbound and outbound trips. In addition, Table 6.3 illustrates the total number of inbound and outbound trips during morning and afternoon peak period.

Table 6.2: Percentage distribution of inbound and outbound trips

Peak	In	Out
AM	73%	27%
PM	23%	77%

Table 6.3: Development generated trips

Year	Peak	In	Out	Total
2023	AM	40	15	55
	PM	18	62	80
2030	AM	60	22	82
	PM	27	91	118

Figure 6.1 and Figure 6.2 show the distribution of the development traffic onto the local road network in the year 2023 (opening year) and 2030 (horizon year).

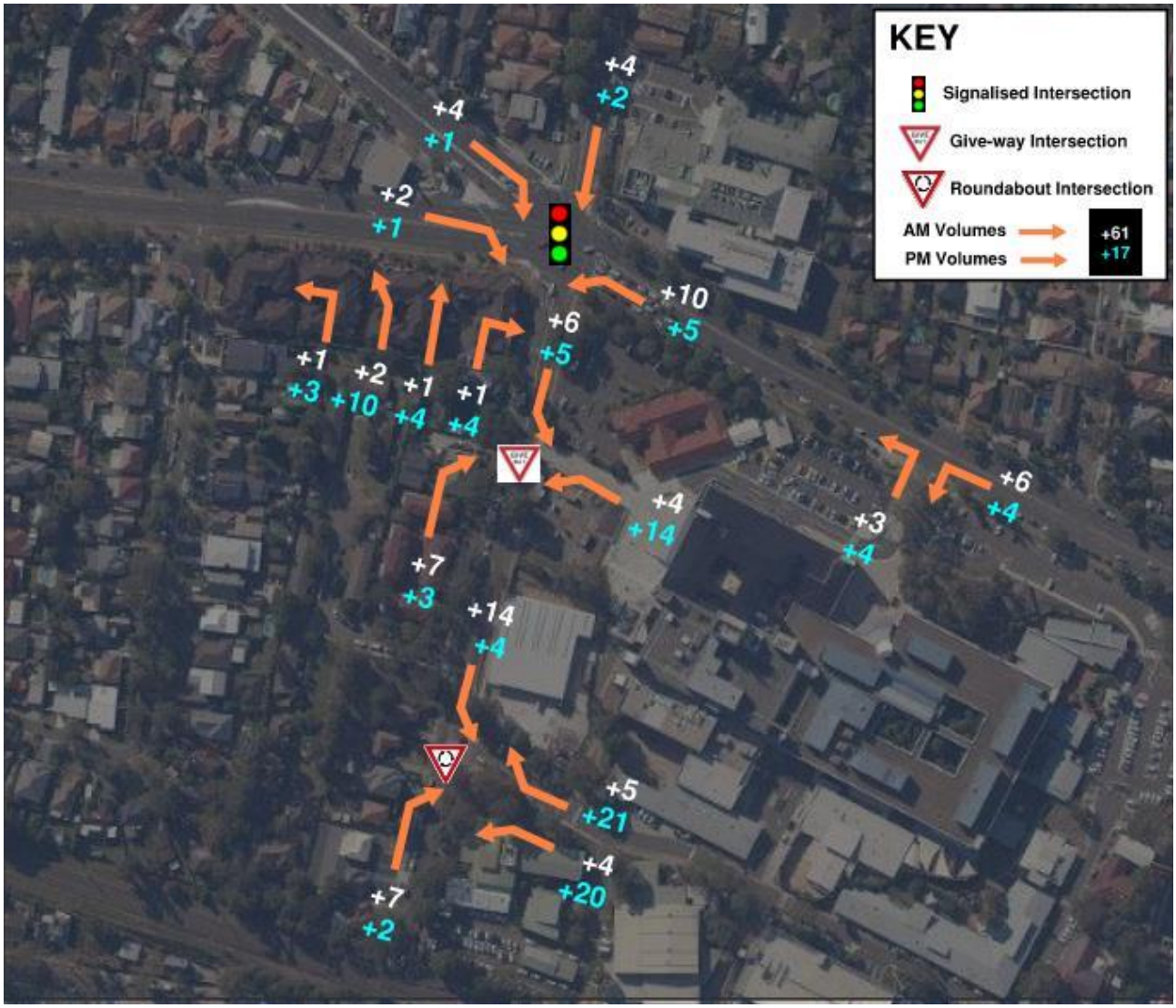


Figure 6.1: Distribution of traffic generated by the development - 2023

.

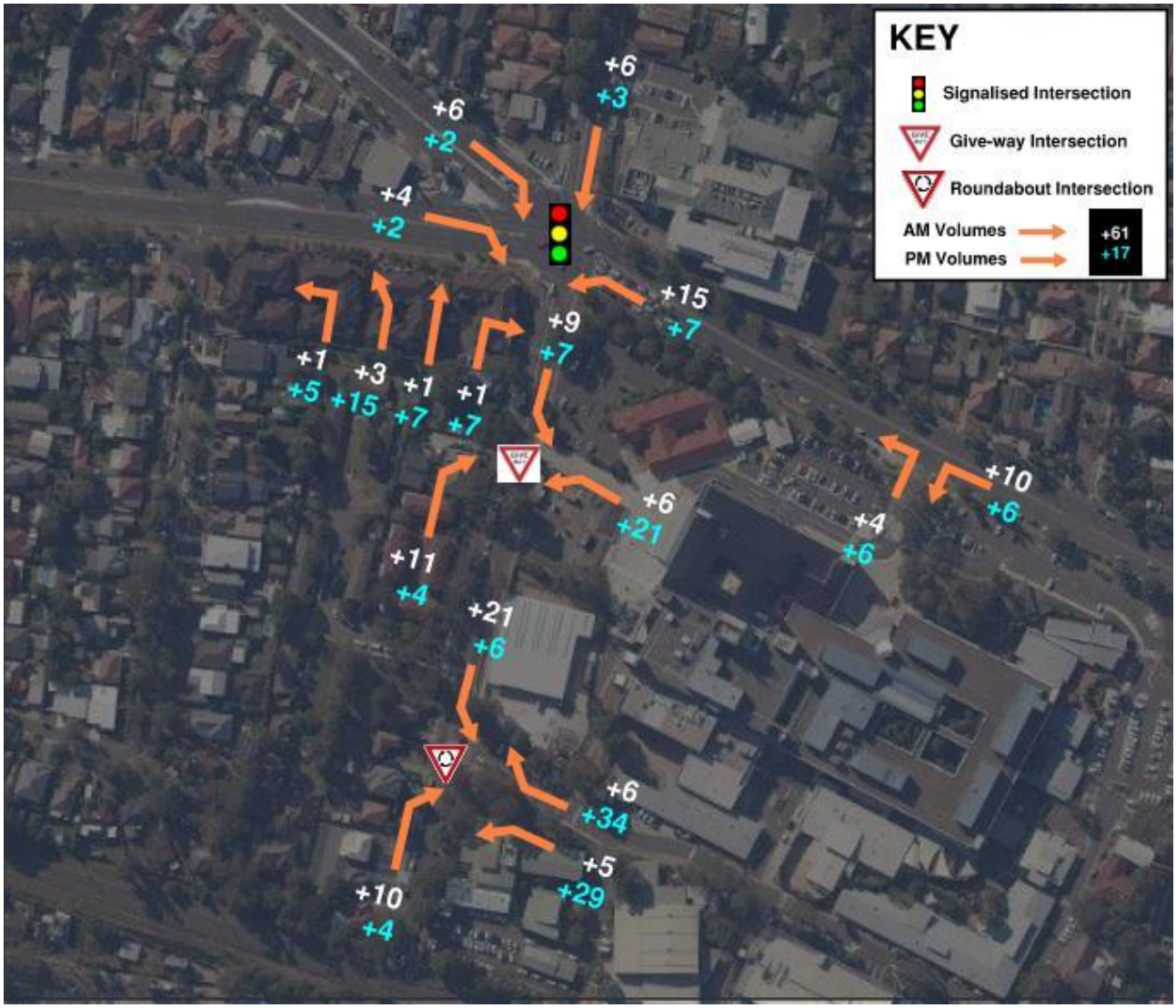


Figure 6.2: Distribution of traffic generated by the development – 2030

6.4 Future Traffic Conditions

The post-development traffic impact on the nominated study intersection has been assessed using SIDRA INTERSECTION. Table 6.4 and Table 6.5 provide a summary of the projected traffic conditions with detailed modelling results attached in Appendix D.

A comparison of the post-development analysis against existing intersection performance shows that the proposed development will have a negligible impact on the overall performance of the Kingsway/ Port Hacking/ Kareena Road intersection, in the year 2023 (Opening Year) and 2030 (Horizon Year). It is noted that with the addition of development traffic in 2030 during PM peak, the southern approach of Kareena Road shows an increase in 95th percentile queue length by approximately 20 metres and delays up by 3 seconds with the same level of service (LOS C) as the base scenario. The overall intersection will operate at LOS C and LOS D during AM and PM peak respectively, which is same as without development scenario in the year 2023 (Opening Year) and 2030 (Horizon Year).

The intersection assessment of the AM peak hour shows that the proposed development would have a minor impact on the overall performance of the signalised intersection with no major queuing observed from the post-development conditions.

The intersection of Kareena Road / Northern Access to the Hospital will become operational prior to the year 2023 (Opening Year). A post-development assessment for the intersection shows no significant vehicle queuing or delays on the newly built right turn lane and overall intersection.

When compared with the existing conditions and the year 2023 operations, the roundabout controlled intersection of Kareena Road/ Southern Access shows a minor improvement in delays. Due to the opening of a right-turn lane at the intersection of Kareena Road / Northern Access, it is assumed that approximately 50% of the northbound traffic on Kareena Road associated with the Hospital is likely to shift to the northern access. This results in improving the intersection operational performance of the roundabout. However, with the anticipated increase in traffic generation by the year 2030, the intersection assessment for the PM peak shows a minor increase in 95th percentile queue by approximately 15 metres on the eastern approach of the roundabout. This increase in the queue would occur within the Hospital boundary and is likely to have a negligible impact on the Kareena Road traffic operations.

Based on the post-development traffic assessment, the proposed redevelopment would have a minor impact on the surrounding traffic with no major additional queuing or delays observed associated with the redevelopment traffic.

Table 6.4: Summary of intersection modelling results – AM Peak

Results for signalised intersection are the average of all movements on each approach.
Results for unsignalised intersections are for the movement with the highest delay on each approach.

Scenario	Intersection	Leg	DOS	Avg Delay (sec)	95% Queue Length (m)	LOS
2019/20 (Existing)	**Kingsway/ Port Hacking Road/ Kareena Road**	South	0.79	41	64	C
		East	0.60	29	83	C
		North	0.64	54	47	D
		North West	0.77	42	54	C
		West	0.70	38	130	C
		Overall	**0.80**	**37**	**130**	**C**
	Kareena Road / Southern Access Road	South	0.43	10	22	A
		East	0.07	12	3	A
		North	0.40	11	18	A
		Overall	**0.43**	**12**	**22**	**A**
2023 (No development)	**Kingsway/ Port Hacking Road/ Kareena Road**	South	0.80	41	64	C
		East	0.58	29	85	C
		North	0.64	55	47	D
		North West	0.77	41	55	C
		West	0.72	40	133	C
		Overall	**0.80**	**37**	**133**	**C**
	Kareena Road / Southern Access Road	South	0.40	10	19	A
		East	0.07	12	3	A
		North	0.40	11	16	A
		Overall	**0.40**	**11**	**19**	**A**
	Kareena Road / Northern Access	South	0.07	8	2	A
		East	0.05	3	2	A
		North	0.35	5	0	A
		Overall	**0.35**	**8**	**2**	**A**
2023 + Development	**Kingsway/ Port Hacking Road/ Kareena Road**	South	0.81	41	64	C
		East	0.60	31	90	C
		North	0.66	55	49	D
		North West	0.80	42	56	C

		West	0.72	39	133	C
		Overall	**0.81**	**38**	**133**	**C**
	Kareena Road / Southern Access Road	South	0.40	10	19	A
		East	0.08	12	3	A
		North	0.40	11	17	A
		Overall	**0.40**	**12**	**19**	**A**
	Kareena Road / Northern Access	South	0.07	8	3	A
		East	0.05	3	2	A
		North	0.35	5	0	A
		Overall	**0.35**	**8**	**3**	**A**
2030 (No development)	**Kingsway/ Port Hacking Road/ Kareena Road**	South	0.79	41	63	C
		East	0.61	30	96	C
		North	0.64	55	47	D
		North West	0.77	41	63	C
		West	0.75	40	153	C
		Overall	**0.80**	**37**	**153**	**C**
	Kareena Road / Southern Access Road	South	0.40	10	19	A
		East	0.07	12	3	A
		North	0.40	11	16	A
		Overall	**0.40**	**12**	**19**	**A**
	Kareena Road / Northern Access	South	0.07	8	2	A
		East	0.05	3	2	A
		North	0.35	5	0	A
		Overall	**0.35**	**8**	**2**	**A**
2030 + development	**Kingsway/ Port Hacking Road/ Kareena Road**	South	0.82	41	64	C
		East	0.62	30	97	C
		North	0.66	55	49	D
		North West	0.81	41	63	C
		West	0.76	40	153	C
		Overall	**0.82**	**38**	**153**	**C**
	Kareena Road / Southern Access Road	South	0.40	10	20	A
		East	0.08	12	3	A
		North	0.40	11	17	A
		Overall	**0.40**	**12**	**20**	**A**
	Kareena Road / Northern Access	South	0.08	8	**3**	A
		East	0.06	3	2	A
		North	0.35	5	0	A
		Overall	**0.35**	**8**	**3**	**A**

Table 6.5: Summary of intersection modelling results – PM Peak

Results for signalised intersection are the average of all movements on each approach.
Results for unsignalised intersections are for the movement with the highest delay on each approach.

Scenario	Intersection	Leg	DOS	Avg Delay (sec)	95% Queue Length (m)	LOS
2019/20 (Existing)	**Kingsway/ Port Hacking Road/ Kareena Road**	South	0.86	39	63	C
		East	0.82	35	152	C
		North	0.62	54	81	D
		North West	0.90	43	88	C
		West	0.83	50	172	D
		Overall	**0.90**	**41**	**172**	**C**
	Kareena Road / Southern Access Road	South	0.30	11	14	A
		East	0.43	24	28	A
		North	0.63	10	48	A
		Overall	**0.63**	**24**	**48**	**B**
2023 (No development)	**Kingsway/ Port Hacking Road/ Kareena Road**	South	0.86	39	63	C
		East	0.85	36	165	C
		North	0.62	54	81	D
		North West	0.90	43	88	D
		West	0.86	53	184	D
		Overall	**0.90**	**43**	**185**	**D**
	Kareena Road / Southern Access Road	South	0.30	11	13	A
		East	0.42	24	29	B
		North	0.61	10	45	A
		Overall	**0.42**	**24**	**45**	**B**
	Kareena Road / Northern Access	South	0.02	10	1	A
		East	0.18	7	5	A
		North	0.50	5	0	A
		Overall	**0.50**	**10**	**5**	**A**
2023 + Development	**Kingsway/ Port Hacking Road/ Kareena Road**	South	0.92	40	66	C
		East	0.85	36	166	C
		North	0.63	55	83	D
		North West	0.90	43	89	D
		West	0.86	52	184	D
		Overall	**0.92**	**43**	**185**	**D**
	Kareena Road / Southern Access Road	South	0.30	11	14	A
		East	0.50	26	38	B
		North	0.61	10	47	A
		Overall	**0.61**	**26**	**47**	**B**
	Kareena Road / Northern Access	South	0.02	10	1	A
		East	0.20	7	5	A
		North	0.50	5	0	A
		Overall	**0.50**	**10**	**5**	**A**
2030 (No development)	**Kingsway/ Port Hacking Road/ Kareena Road**	South	0.86	39	64	C
		East	0.88	39	194	C
		North	0.62	55	81	D

		North West	0.97	47	100	D
		West	0.90	57	218	E
		Overall	**0.98**	**45**	**218**	**D**
	Kareena Road / Southern Access Road	South	0.30	11	14	A
		East	0.41	24	29	B
		North	0.61	10	45	A
		Overall	**0.61**	**24**	**45**	**B**
	Kareena Road / Northern Access	South	0.02	10	1	A
		East	0.18	7	5	A
		North	0.50	5	0	A
		Overall	**0.50**	**10**	**5**	**A**
2030 + development	**Kingsway/ Port Hacking Road/ Kareena Road**	South	0.90	43	69	C
		East	0.90	41	204	C
		North	0.64	55	84	D
		North West	0.98	48	104	D
		West	0.90	57	218	E
		Overall	**0.98**	**47**	**218**	**D**
	Kareena Road / Southern Access Road	South	0.31	11	14	A
		East	0.53	28	45	A
		North	0.61	10	47	A
		Overall	**0.61**	**28**	**47**	**A**
	Kareena Road / Northern Access	South	0.02	10	1	A
		East	0.22	8	6	A
		North	0.50	5	0	A
		Overall	**0.50**	**10**	**6**	**A**

7 Green Travel Plan

A Green Travel Plan (GTP) for this site including a Workplace Travel Plan has been developed and submitted as part of this SSDA.

The document is intended to be dynamic and respond to staff and visitor behaviours. NSW Health has a track record of developing Green Travel Plans and Workplace Travel Plans for many hospital sites, and this Green Travel Plans and Workplace Travel Plan will form a strong reference point for further development or new documents in the future.

While it is intended that a strong operational focus will be placed on the implementation of the Green Travel Plan, this impact assessment for this development is based on existing transport habits without implementation of sustainable travel initiatives. This is to allow for any potential delays in uptake of sustainable measures, which is in the hands of individual end-users. As measures are adopted and uptake increases, traffic conditions around the site would improve relative to what has been assessed in this report.

8 Construction Traffic Management

A Construction Traffic and Pedestrian Management Plan (CTPMP) for this site have been developed and submitted as part of this SSDA.

A detailed CTPMP shall be developed by the builder with consideration of all final design selections and construction methodology. The draft CTPMP is intended to provide a framework within which a future CTPMP can be developed and implemented, and to demonstrate the potential operation of the construction site.

9 Operational Traffic Management

A preliminary Operational Traffic and Access Management Plan (OTAMP) for this site has been developed and submitted as part of this SSDA.

A final OTAMP shall be developed by the client prior to operation of the new building, with consideration of all detailed operational planning at that time. The Preliminary OTAMP is intended to demonstrate a framework within which a future OTAMP can be developed and implemented, and highlight the traffic and access issues which may need to be coordinated and prioritised as part of that planning and documentation.

10 Conclusion

This transport and accessibility impact assessment has been prepared to examine the proposed Operating Theatre Upgrade Project at TSH and its impact on the local transport network.

A detailed analysis of traffic impacts has been undertaken, with a post-development analysis of relevant local intersections. With 10 years of background traffic growth and an estimated increase of up to 183 staff (by headcount), all intersections continue to operate at acceptable Levels of Service.

The parking assessment shows that with the proposed redevelopment, the Hospital is likely to see an increase in parking demand by up to approximately 80 spaces once the development will reach its 100% anticipated staffing level. Based on the parking demand study, the additional parking demand associated with the redevelopment can be catered within the existing car parking provision with a remaining surplus of approximately 44 parking spaces.

Active transport facilities including pedestrian and cycling infrastructure, are currently well catered for within the road network, which has good pedestrian footpaths and an on-road cycling network. Additional facilities including bicycle storage rails and shower facilities shall be available to staff, and a Green Travel Plan (GTP) including Workplace Travel Plan (WTP) has been developed which plans to encourage active transport usage.

A Construction Traffic and Pedestrian Management Plan (CTPMP) has also been developed. Once design development for the Hospital has been completed and a builder engaged, a detailed CTPMP will be prepared and submitted to authorities. Main traffic impacts are expected to occur during excavation and concrete pours. The site has good road access for construction vehicles, with close proximity to Kingsway and Port Hacking Road.

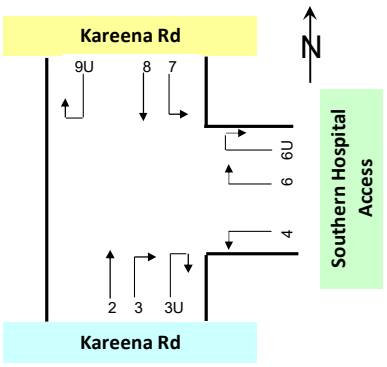
An Operational Traffic and Access Management Plan (OTAMP) has been developed. Prior to occupation and operation of the new facility, a finalised OTAMP will be prepared and submitted to authorities which is expected as a condition of development consent. The OTAMP demonstrates that a hierarchy of different vehicle types will need to be managed within the site, and that there are expected to be various ways to do so safely and efficiently.

The proposed development is considered acceptable with regards to its traffic and parking impacts. The capacity of the local road network and the site with regards to both traffic and parking is considered sufficient to cater for the redevelopment and is recommended for approval.

Appendix A: Traffic Survey Results

Job No. : N6034
Client : TTW
Suburb : Sutherland Hospital
Location : 1. Kareena Rd / Southern Hospital Access

Day/Date : Thu, 29 Oct 2020
Weather : Fine
Description : Classified Intersection Count
: Peak Hour Summary

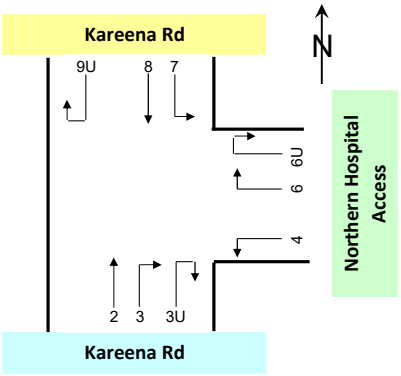


Approach	Kareena Rd				Southern Hospital Access				Kareena Rd					Grand Total
Time Period	Lights	Heavies	Ambulance	Total	Lights	Heavies	Ambulance	Total	Lights	Heavies	Ambulance	Total		
8:00 to 9:00	556	6	2	**564**	61	2	3	**66**	447	9	2	**458**		**1,088**
16:15 to 17:15	310	5	2	**317**	236	1	2	**239**	862	9	1	**872**		**1,428**

Approach	Kareena Rd				Southern Hospital Access				Kareena Rd					Grand Total
Time Period	Lights	Heavies	Ambulance	Total	Lights	Heavies	Ambulance	Total	Lights	Heavies	Ambulance	Total		
6:00 to 7:00	333	6	0	**339**	13	4	2	**19**	157	6	1	**164**		**522**
6:15 to 7:15	357	4	0	**361**	16	5	1	**22**	208	6	3	**217**		**600**
6:30 to 7:30	426	5	0	**431**	34	5	0	**39**	273	7	3	**283**		**753**
6:45 to 7:45	465	5	0	**470**	48	5	0	**53**	319	7	2	**328**		**851**
7:00 to 8:00	510	3	0	**513**	51	2	0	**53**	366	4	2	**372**		**938**
7:15 to 8:15	551	3	0	**554**	60	0	0	**60**	401	6	0	**407**		**1,021**
7:30 to 8:30	567	4	0	**571**	50	0	0	**50**	425	8	2	**435**		**1,056**
7:45 to 8:45	580	6	1	**587**	50	0	0	**50**	441	7	2	**450**		**1,087**
8:00 to 9:00	556	6	2	**564**	61	2	3	**66**	447	9	2	**458**		**1,088**
AM Totals	**1,399**	**15**	**2**	**1,416**	**125**	**8**	**5**	**138**	**970**	**19**	**5**	**994**		**2,548**
15:00 to 16:00	384	8	1	**393**	143	2	2	**147**	749	9	2	**760**		**1,300**
15:15 to 16:15	370	8	3	**381**	162	2	2	**166**	759	8	2	**769**		**1,316**
15:30 to 16:30	358	8	3	**369**	178	1	2	**181**	790	14	2	**806**		**1,356**
15:45 to 16:45	345	5	3	**353**	205	1	2	**208**	826	10	3	**839**		**1,400**
16:00 to 17:00	309	4	4	**317**	218	0	2	**220**	847	10	1	**858**		**1,395**
16:15 to 17:15	310	5	2	**317**	236	1	2	**239**	862	9	1	**872**		**1,428**
16:30 to 17:30	324	4	2	**330**	236	1	1	**238**	851	3	1	**855**		**1,423**
16:45 to 17:45	329	3	5	**337**	193	1	1	**195**	822	7	0	**829**		**1,361**
17:00 to 18:00	322	2	4	**328**	160	1	0	**161**	809	6	0	**815**		**1,304**
PM Totals	**1,015**	**14**	**9**	**1,038**	**521**	**3**	**4**	**528**	**2,405**	**25**	**3**	**2,433**		**3,999**

Job No. : N6034
Client : TTW
Suburb : Sutherland Hospital
Location : 2. Kareena Rd / Northern Hospital Access

Day/Date : Thu, 29 Oct 2020
Weather : Fine
Description : Classified Intersection Count
: Peak Hour Summary

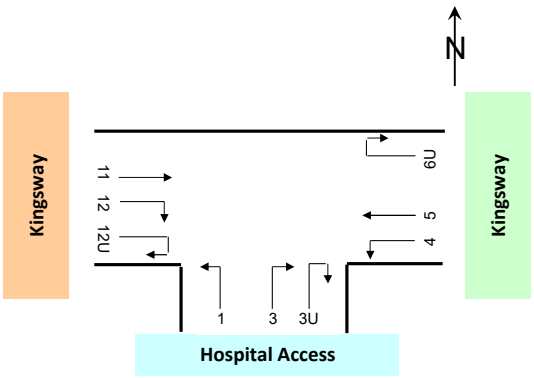


Approach	Kareena Rd				Northern Hospital Access				Kareena Rd					Grand Total
Time Period	Lights	Heavies	Ambulance	Total	Lights	Heavies	Ambulance	Total	Lights	Heavies	Ambulance	Total		
8:00 to 9:00	490	7	3	**500**	35	0	1	**36**	457	9	1	**467**		1,003
16:30 to 17:30	451	5	1	**457**	79	0	1	**80**	792	3	3	**798**		1,335

Approach	Kareena Rd				Northern Hospital Access				Kareena Rd					Grand Total
Time Period	Lights	Heavies	Ambulance	Total	Lights	Heavies	Ambulance	Total	Lights	Heavies	Ambulance	Total		
6:00 to 7:00	284	10	2	**296**	11	0	0	**11**	174	6	1	**181**		**488**
6:15 to 7:15	297	9	2	**308**	15	0	0	**15**	228	6	1	**235**		**558**
6:30 to 7:30	347	10	0	**357**	20	0	0	**20**	293	7	1	**301**		**678**
6:45 to 7:45	375	10	0	**385**	24	0	0	**24**	335	7	0	**342**		**751**
7:00 to 8:00	389	5	0	**394**	26	0	0	**26**	386	4	1	**391**		**811**
7:15 to 8:15	420	3	1	**424**	28	0	1	**29**	428	6	1	**435**		**888**
7:30 to 8:30	439	4	1	**444**	28	0	1	**29**	455	8	1	**464**		**937**
7:45 to 8:45	478	5	1	**484**	34	0	1	**35**	466	7	2	**475**		**994**
8:00 to 9:00	490	7	3	**500**	35	0	1	**36**	457	9	1	**467**		**1,003**
AM Totals	**1,163**	**22**	**5**	**1,190**	**72**	**0**	**1**	**73**	**1,017**	**19**	**3**	**1,039**		**2,302**
15:00 to 16:00	436	8	1	**445**	73	0	0	**73**	712	9	3	**724**		**1,242**
15:15 to 16:15	441	8	2	**451**	73	0	0	**73**	728	7	3	**738**		**1,262**
15:30 to 16:30	440	7	3	**450**	76	0	0	**76**	752	13	4	**769**		**1,295**
15:45 to 16:45	441	4	3	**448**	92	0	1	**93**	779	10	4	**793**		**1,334**
16:00 to 17:00	429	4	3	**436**	92	0	1	**93**	784	10	1	**795**		**1,324**
16:15 to 17:15	432	6	2	**440**	85	0	1	**86**	794	9	3	**806**		**1,332**
16:30 to 17:30	451	5	1	**457**	79	0	1	**80**	792	3	3	**798**		**1,335**
16:45 to 17:45	436	4	1	**441**	73	0	0	**73**	758	7	3	**768**		**1,282**
17:00 to 18:00	423	2	0	**425**	63	0	0	**63**	753	6	3	**762**		**1,250**
PM Totals	**1,288**	**14**	**4**	**1,306**	**228**	**0**	**1**	**229**	**2,249**	**25**	**7**	**2,281**		**3,816**

Job No. : N6034
Client : TTW
Suburb : Sutherland Hospital
Location : 3. Kingsway / Hospital Access

Day/Date : Thu, 29 Oct 2020
Weather : Fine
Description : Classified Intersection Count
: Peak Hour Summary



Approach	Hospital Access				Kingsway					Kingsway				Grand Total
Time Period	Lights	Heavies	Ambulance	Total	Lights	Heavies	Ambulance	Total		Lights	Heavies	Ambulance	Total	
8:00 to 9:00	21	0	0	**21**	1,131	40	5	**1,176**		1,416	52	0	**1,468**	**2,665**
16:45 to 17:45	16	1	2	**19**	1,708	28	2	**1,738**		1,518	23	0	**1,541**	**3,298**

Approach	Hospital Access				Kingsway					Kingsway				Grand Total
Time Period	Lights	Heavies	Ambulance	Total	Lights	Heavies	Ambulance	Total		Lights	Heavies	Ambulance	Total	
6:00 to 7:00	19	0	0	**19**	582	31	0	**613**		766	54	0	**820**	**1,452**
6:15 to 7:15	27	0	0	**27**	635	33	0	**668**		881	57	0	**938**	**1,633**
6:30 to 7:30	30	0	0	**30**	722	36	0	**758**		943	58	0	**1,001**	**1,789**
6:45 to 7:45	28	0	0	**28**	789	36	0	**825**		994	61	0	**1,055**	**1,908**
7:00 to 8:00	29	0	0	**29**	883	32	0	**915**		1,022	52	0	**1,074**	**2,018**
7:15 to 8:15	28	0	0	**28**	977	35	1	**1,013**		1,100	55	0	**1,155**	**2,196**
7:30 to 8:30	27	0	0	**27**	1,047	35	2	**1,084**		1,254	51	0	**1,305**	**2,416**
7:45 to 8:45	23	0	0	**23**	1,114	36	4	**1,154**		1,353	45	0	**1,398**	**2,575**
8:00 to 9:00	21	0	0	**21**	1,131	40	5	**1,176**		1,416	52	0	**1,468**	**2,665**
AM Totals	**69**	**0**	**0**	**69**	**2,596**	**103**	**5**	**2,704**		**3,204**	**158**	**0**	**3,362**	**6,135**
15:00 to 16:00	24	0	0	**24**	1,519	47	2	**1,568**		1,407	37	0	**1,444**	**3,036**
15:15 to 16:15	27	1	0	**28**	1,581	50	4	**1,635**		1,421	30	0	**1,451**	**3,114**
15:30 to 16:30	24	1	0	**25**	1,541	52	4	**1,597**		1,454	30	0	**1,484**	**3,106**
15:45 to 16:45	23	1	1	**25**	1,550	54	4	**1,608**		1,437	36	0	**1,473**	**3,106**
16:00 to 17:00	24	1	1	**26**	1,604	50	3	**1,657**		1,470	36	0	**1,506**	**3,189**
16:15 to 17:15	18	0	2	**20**	1,597	41	2	**1,640**		1,483	34	0	**1,517**	**3,177**
16:30 to 17:30	18	1	3	**22**	1,666	34	2	**1,702**		1,456	28	0	**1,484**	**3,208**
16:45 to 17:45	16	1	2	**19**	1,708	28	2	**1,738**		1,518	23	0	**1,541**	**3,298**
17:00 to 18:00	17	1	2	**20**	1,692	24	3	**1,719**		1,488	17	0	**1,505**	**3,244**
PM Totals	**65**	**2**	**3**	**70**	**4,815**	**121**	**8**	**4,944**		**4,365**	**90**	**0**	**4,455**	**9,469**

Appendix B: Parking Occupancy Results

Client	TTW
Date	Thur, 23rd Jul 2020
Survey Time	6:00-18:00 (Inclusive)
Description	Sutherland Hospital Parking Survey

Street	Side	Between	Restriction	Time Restriction	Supply	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00
Port Hacking Rd	North	btwn Junction St & Kareena Rd	No Restriction		34	24	27	27	25	25	27	30	31	31	25	24	19	11
			No Stopping															
	South	btwn Kareena Rd & Junction St	No Stopping															
			No Restriction		28	27	31	27	26	26	26	26	26	26	23	22	17	12
			No Stopping															
Total					62	51	58	54	51	51	53	56	57	57	48	46	36	23
% Capacity						82%	94%	87%	82%	82%	85%	90%	92%	92%	77%	74%	58%	37%
Kingsway	North	btwn Junction St & Port Hacking Rd	Bus Zone															
			No Restriction		20	8	10	10	11	12	12	14	15	15	15	13	12	8
			No Stopping															
		btwn Kareena Rd & Carrington Ave	No Stopping															
			Bus Zone															
			No Parking															
			No Parking	6am-10am & 3pm-7pm Mon-Fri	10	0	0	0	0	7	6	5	5	2	0	0	0	0
			No Parking															
			No Stopping															
		btwn Carrington Ave & Chamberlain Ave	No Stopping															
			No Parking	6am-10am & 3pm-7pm Mon-Fri	8	0	0	0	0	2	2	1	1	1	0	0	0	0
		btwn Chamberlain Ave & Taren Point Rd	No Stopping															
	South	btwn Taren Point Rd & Hinkler Ave	No Stopping															
			No Parking															
		btwn Hinkler Ave & Kareena Rd	No Stopping															
			No Parking															
			Bus Zone															
			No Parking															
			No Parking	6am-10am & 3pm-7pm Mon-Fri	16	0	0	0	0	6	6	5	5	4	0	0	0	0
			No Stopping															
			Bus Zone															
			No Parking															
			No Stopping															
		btwn Kareena Rd & Carramar Cres	No Stopping															
			No Parking															
			No Stopping															
		btwn Carramar Cres & Opposite to Junction St	No Stopping															
			Bus Zone															
			No Parking															
			Bus Zone															
			No Parking															
Total					54	8	10	10	11	27	26	25	26	22	15	13	12	8
% Capacity						15%	19%	19%	20%	50%	48%	46%	48%	41%	28%	24%	22%	15%
Kareena Rd	East	btwn Kingsway & Roundabout	No Parking															
		btwn Roundabout & Railway cross line	No Stopping															
			No Restriction		11	11	11	11	11	11	11	11	11	11	9	7	6	
	West	btwn Railway cross line & Kindilan Pl	No Restriction		11	9	9	9	10	10	9	10	10	9	9	7	7	5
			No Stopping															
		btwn Kindilan Pl & Kingsway	No Stopping															
			No Parking	6:30am-9:30am & 3:30pm-6:30pm Mon-Fri	11	0	0	0	0	11	9	10	8	7	4	0	0	0
			Bus Zone															
			No Stopping															
Total					33	20	20	20	21	32	29	31	29	27	24	16	14	11
% Capacity						61%	61%	61%	64%	97%	88%	94%	88%	82%	73%	48%	42%	33%
Car Park 1	Off-St	Wilson Parking, South of Kingsway	Reserved	Hospital Fleet Vehicle Only	3	2	2	2	3	3	3	2	2	3	2	2	3	1
			Loading Zone 30min only		2	0	0	0	0	0	0	0	0	0	0	0	0	0
			P 15min		1	0	1	1	0	0	0	0	0	0	0	0	0	0
			No Parking	Fire & Police & Ambulance Vehicles Excepted	2	0	0	0	0	0	0	0	0	0	0	0	0	0
		Wilson Parking (Inside Boom Gate)	Motorcycle		2	2	2	2	2	2	2	2	2	2	2	2	1	1
			No Restriction		47	12	13	29	36	44	45	40	36	35	33	41	35	26
			Disabled		3	2	2	2	3	3	3	2	2	2	2	2	2	1
Total					60	18	20	36	44	52	53	46	42	42	39	47	41	29
% Capacity						30%	33%	60%	73%	87%	88%	77%	70%	70%	65%	78%	68%	48%
Car Park 2	Off-St	Wilson Parking, btwn Kareena Rd & Kingsway	No Restriction		56	10	11	21	29	33	33	31	30	31	31	22	20	15
			Disabled		2	0	0	0	0	0	0	0	0	1	1	0	0	0
Total					58	10	11	21	29	33	33	31	30	32	32	22	20	15
% Capacity						17%	19%	36%	50%	57%	57%	53%	52%	55%	55%	38%	34%	26%
Car Park 3	Off-St	Wilson Parking, East of Kareena Rd	No Restriction		44	10	11	21	29	34	33	35	31	30	30	22	24	22
			No Parking		1	0	0	0	0	0	0	0	0	0	0	0	0	0
Total					45	10	11	21	29	34	33	35	31	30	30	22	24	22
% Capacity						22%	24%	47%	64%	76%	73%	78%	69%	67%	67%	49%	53%	49%
Car Park 4	Off-St	South of Kingsway	No Restriction	90° Angle Parking, Front to Kerb Vehicles under 6m only	3	0	0	1	2	2	2	2	1	1	1	1	1	1
			No Restriction		130	32	41	49	98	96	104	112	109	106	80	82	78	62
			Reserved	Mobile Dental Clinic only	1	0	0	0	0	0	1	0	0	0	0	0	0	0
		South of Kingsway (Outside Boom Gate)	Disabled		6	0	1	1	2	2	1	1	2	3	3	3	3	2
			Reserved	Community Rehab Bus Permit Holders only	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Total					141	32	42	51	102	100	108	115	112	110	84	86	82	65
% Capacity						23%	30%	36%	72%	71%	77%	82%	79%	78%	60%	61%	58%	46%
Car Park 5	Off-St	On Grade	No Restriction		210	31	55	171	184	209	210	205	201	197	199	126	102	83
		Ground Level	Motor Bike Only		8	2	2	2	2	2	2	2	2	2	2	1	1	0
			No Restriction		35	31	35	35	35	35	35	34	33	31	30	19	12	8
		Level 1	Disabled		8	0	0	2	3	4	4	3	4	4	4	2	1	1
			No Restriction		23	19	23	23	23	22	23	23	23	22	22	19	16	11
		Level 1A	No Restriction		41	33	40	40	41	40	41	40	41	40	40	21	14	12
		Level 2	No Restriction		41	16	30	35	37	41	41	41	39	41	39	23	15	10
		Level 2A	No Restriction		41	3	6	26	29	35	41	38	40	41	41	19	13	11
		Level 3	No Restriction		41	1	1	19	24	31	41	41	41	41	40	31	25	17
		Level 3A	No Restriction		41	0	1	20	25	29	41	40	41	41	41	37	33	27
		Rooftop 1	Motor Bike only		1	0	0	0	0	0	0	0	0	0	0	0	0	0
			No Restriction		39	0	0	9	13	17	26	30	29	32	31	29	28	20
		Rooftop 2	No Restriction		40	0	1	1	1	1	1	4	5	5	5	4	3	2
Total					569	136	194	383	417	466	506	501	499	497	494	331	263	202
% Capacity						24%	34%	67%	73%	82%	89%	88%	88%	87%	87%	58%	46%	36%

Appendix C: Parking Duration Results

Client SUTHERLAND HOSPITAL PARKING SURVEY REPORT

Location Car Park 1

Description TITLE OF PARKING SURVEY

MATRIX Traffic and Transport Data

Date Wednesday, 06 November 2019
Site Car Park 1
Total Parking Spaces 50

Peak demand 60
Peak Demand % 120%
Ave Duration of Stay(h:mm) 2:59
Total Vehicles 269

Total	70	88	54	19	9	6	6	7	2	2	1	0	1	1	0	0	0	1	0	0	0	0	1	1			
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	0:00	Total	Accumulation	% Capacity
00:00																									0	0	0%
01:00	1																								1	1	2%
02:00					1																				1	1	2%
03:00																									0	1	2%
04:00																									0	1	2%
05:00																									0	1	2%
06:00	1	2	3			1	1							1											9	10	20%
07:00	4	6	2	2	1	1		2	1	1															20	28	56%
08:00	9	7	3	2	1	1	1	1	1				1												27	49	98%
09:00	6	6	6	1																			1		20	51	102%
10:00	2	6	3	4	1	1				1															18	54	108%
11:00	8	5	1	1	2			1			1														19	60	120%
12:00	2	6	4	1		1	1																		15	51	102%
13:00	2	9	2																					1	14	51	102%
14:00	2	5	4	3				1																	15	52	104%
15:00	5	6	2	2																					15	47	94%
16:00	5	5	5		1																				16	45	90%
17:00	4	9	4	2		1																			20	48	96%
18:00	7	6	8		1																				22	55	110%
19:00	7	6	3	1	1			1																	19	49	98%
20:00	2	2	3																						7	37	74%
21:00	1	1					2											1							5	22	44%
22:00	1	1	1				1																		4	18	36%
23:00	1							1																	2	12	24%

Client SUTHERLAND HOSPITAL PARKING SURVEY REPORT

Location Car Park 2

Description TITLE OF PARKING SURVEY

MATRIX Traffic and Transport Data

Date Wednesday, 06 November 2019
Site Car Park 2
Total Parking Spaces 58

Peak demand 61
Peak Demand % 105%
Ave Duration of Stay(h:mm) 4:12
Total Vehicles 128

Total	38	23	18	6	7	4	3	3	15	3	6	0	0	0	0	0	1	0	0	0	0	0	0	1			
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	0:00	Total	Accumulation	% Capacity
00:00																									0	0	0%
01:00																									0	0	0%
02:00																									0	0	0%
03:00																									0	0	0%
04:00																									0	0	0%
05:00									1																1	1	2%
06:00						1			1	1															3	4	7%
07:00	1				2				6		3														12	16	28%
08:00	4	2		1		1	1	3	5	1															18	33	57%
09:00	7	4	6	1	2	1	1		1	1															24	53	91%
10:00	2	6	4	1	1						1														15	59	102%
11:00	5	1	2																						8	61	105%
12:00	8	3	3	2	2		1																	1	20	60	103%
13:00		4	1	1																					6	52	90%
14:00	5		2																						7	49	84%
15:00	3	1																							4	37	64%
16:00	2	1				1											1								5	25	43%
17:00	1	1																							2	14	24%
18:00																									0	7	12%
19:00																									0	4	7%
20:00											1														1	5	9%
21:00											1														1	5	9%
22:00									1																1	5	9%
23:00																									0	5	9%

Client SUTHERLAND HOSPITAL PARKING SURVEY REPORT

Location Car Park 3

Description TITLE OF PARKING SURVEY

MATRIX Traffic and Transport Data

Date Wednesday, 06 November 2019
Site Car Park 3
Total Parking Spaces 44

Peak demand 51
Peak Demand % 116%
Ave Duration of Stay(h:mm) 3:48
Total Vehicles 145

Total	32	42	21	9	7	4	5	4	12	2	3	3	1	0	0	0	0	0	0	0	0	0	0	0			
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	0:00	Total	Accumulation	% Capacity
00:00																									0	0	0%
01:00																									0	0	0%
02:00																									0	0	0%
03:00																									0	0	0%
04:00																									0	0	0%
05:00																									0	0	0%
06:00		1						2	2			3													8	8	18%
07:00									2		1														3	11	25%
08:00	2	4	2	1			1	1	2	1			1												15	25	57%
09:00	3	8	3	1	4		2	1	1																23	46	105%
10:00	2	4	4	1																					11	50	114%
11:00	1	4		1		1	1																		8	46	105%
12:00	6	2	1	1	1	1	1		1																14	51	116%
13:00	5	2							1		1														9	45	102%
14:00	2	3	2	2		1			1	1															12	43	98%
15:00		1		2					1																4	38	86%
16:00	1		2																						3	32	73%
17:00	2	1	2		1																				6	29	66%
18:00	3	8	5		1																				17	34	77%
19:00	4	4				1																			9	34	77%
20:00	1										1														2	21	48%
21:00																									0	9	20%
22:00									1																1	8	18%
23:00																									0	6	14%

Client SUTHERLAND HOSPITAL PARKING SURVEY REPORT

Location Car Park 5

Description TITLE OF PARKING SURVEY

MATRIX Traffic and Transport Data

Date Wednesday, 06 November 2019
Site Car Park 5
Total Parking Spaces 562

Peak demand 513
Peak Demand % 91%
Ave Duration of Stay(h:mm) 7:12
Total Vehicles 714

Total	44	94	40	30	29	15	18	47	212	109	42	6	14	9	2	0	0	1	0	1	0	0	0	1			
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	0:00	Total	Accumulation	% Capacity
00:00																									0	0	0%
01:00																									0	0	0%
02:00																									0	0	0%
03:00																									0	0	0%
04:00																									0	0	0%
05:00									2	1	1		1												5	5	1%
06:00		2	1				1	4	23	16	3	1	7	4				1							63	68	12%
07:00	3	4	3	2	2	2	4	11	79	52	16	4	2	2											186	254	45%
08:00	4	9	5	4	6	7	7	20	62	29	6		1		1										161	410	73%
09:00	5	13	5	5	3	1	3	6	13	3	1														58	459	82%
10:00	2	8	6	1	1			1	2																21	463	82%
11:00	8	9	6	1	6	2	2	1		1														1	37	478	85%
12:00	1	7	2	4	5	1			4		1														25	476	85%
13:00	5	9	4	8	4	1	1	1	23	7	2	1								1					67	513	91%
14:00	3	13	2	4		1		3	3																29	503	90%
15:00	2	6	1		1																				10	454	81%
16:00	3	5	1		1																				10	316	56%
17:00	3	2		1									1												7	174	31%
18:00	2	5	4								1		2	2											16	109	19%
19:00																									0	80	14%
20:00	1	1									1			1											4	69	12%
21:00	2								1		10				1										14	67	12%
22:00		1																							1	39	7%
23:00																									0	27	5%

Client SUTHERLAND HOSPITAL PARKING SURVEY REPORT

Location Car Park 6

Description TITLE OF PARKING SURVEY

MATRIX Traffic and Transport Data

Date Wednesday, 06 November 2019
Site Car Park 6
Total Parking Spaces 139

Peak demand 83
Peak Demand % 60%
Ave Duration of Stay(h:mm) 7:29
Total Vehicles 139

Total	15	19	5	9	10	3	14	5	19	19	3	0	4	0	0	1	0	1	4	2	1	1	4	0			
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	0:00	Total	Accumulation	% Capacity
00:00																									0	0	0%
01:00																									0	0	0%
02:00																									0	0	0%
03:00																									0	0	0%
04:00																									0	0	0%
05:00													1												1	1	1%
06:00									1	4			1												6	7	5%
07:00	1	2		1	1		1	1	3	10	1		1												22	29	21%
08:00	3	5			3	1	7		9	4															32	60	43%
09:00	1			1	2	2	3	2	1	1															13	68	49%
10:00	3	1					2	1	1														1		9	71	51%
11:00	2	4	1	1			1																1		10	77	55%
12:00	1	1	2					1																	5	78	56%
13:00		1		5	3				1											1			1		12	81	58%
14:00	1	1	1		1				1										1	1		1			8	83	60%
15:00	1	2	1															1	2		1		1		9	76	55%
16:00		1		1												1			1						4	68	49%
17:00	1																								1	38	27%
18:00		1																							1	24	17%
19:00	1																								1	21	15%
20:00													1												1	17	12%
21:00									1		2														3	20	14%
22:00									1																1	20	14%
23:00																									0	19	14%

Client	SUTHERLAND HOSPITAL PARKING SURVEY REPORT
Location	Car Park 1
Description	TITLE OF PARKING SURVEY

Date	Thursday, 07 November 2019		
Site	Car Park 1	**Peak demand**	63
Total Parking Spaces	50	**Peak Demand %**	126%
		Ave Duration of Stay(h:mm)	2:23
		Total Vehicles	279

Total	99	104	35	15	6	4	7	2	1	5	0	0	0	0	0	0	0	1	0	0	0	0	0	0			
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	0:00	Total	Accumulation	% Capacity
00:00				1	1																				2	2	4%
01:00																									0	2	4%
02:00																									0	2	4%
03:00																									0	2	4%
04:00							1																		1	2	4%
05:00																									0	1	2%
06:00	2	1	1		1	1	1			2								1							10	11	22%
07:00	4	1	3		1		1	1	1																12	21	42%
08:00	14	8	2	2	1	1	2			3															33	49	98%
09:00	4	10	4																						18	51	102%
10:00	6	3	1					1																	11	47	94%
11:00	11	9	3	2	1	1	1																		28	55	110%
12:00	6	6	4	2		1	1																		20	53	106%
13:00	13	11	2																						26	61	122%
14:00	13	7	1	4	1																				26	63	126%
15:00	8	8	2																						18	48	96%
16:00	6	11	4																						21	46	92%
17:00	4	6	2	1																					13	43	86%
18:00	5	8	3	1																					17	33	66%
19:00	3	10	2	1																					16	32	64%
20:00		4	1	1																					6	25	50%
21:00																									0	11	22%
22:00		1																							1	5	10%
23:00																									0	3	6%

Client	SUTHERLAND HOSPITAL PARKING SURVEY REPORT
Location	Car Park 2
Description	TITLE OF PARKING SURVEY

MATRIX Traffic and Transport Data

Date	Thursday, 07 November 2019		
Site	Car Park 2	**Peak demand**	46
Total Parking Spaces	58	**Peak Demand %**	79%
		Ave Duration of Stay(h:mm)	3:27
		Total Vehicles	97

Total	32	29	10	1	2	1	4	2	11	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0			
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	0:00	Total	Accumulation	% Capacity
00:00																									0	0	0%
01:00																									0	0	0%
02:00																									0	0	0%
03:00																									0	0	0%
04:00																									0	0	0%
05:00									1																1	1	2%
06:00								1		1															2	3	5%
07:00	1								5	1															7	10	17%
08:00	1	1			1				3	2															8	17	29%
09:00	3	4	2				2					1													12	28	48%
10:00	6	7	2		1		1																		17	41	71%
11:00	5	7	2				1																		15	46	79%
12:00	2	2	1	1		1			1																8	40	69%
13:00	6	4	1																						11	39	67%
14:00		2	1					1	1																5	32	55%
15:00	3	1																							4	30	52%
16:00			1																						1	16	28%
17:00	2	1																							3	12	21%
18:00	1																								1	7	12%
19:00																									0	4	7%
20:00	2																								2	6	10%
21:00																									0	2	3%
22:00																									0	1	2%
23:00																									0	0	0%

Client	SUTHERLAND HOSPITAL PARKING SURVEY REPORT
Location	Car Park 3
Description	TITLE OF PARKING SURVEY

Date	Thursday, 07 November 2019		
Site	Car Park 3	**Peak demand**	45
Total Parking Spaces	44	**Peak Demand %**	102%
		Ave Duration of Stay(h:mm)	3:21
		Total Vehicles	120

Total	33	42	10	7	4	7	1	3	7	1	1	2	1	1	0	0	0	0	0	0	0	0	0	0			
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	0:00	Total	Accumulation	% Capacity
00:00																									0	0	0%
01:00																									0	0	0%
02:00									1																1	1	2%
03:00																									0	1	2%
04:00																									0	1	2%
05:00																									0	1	2%
06:00		1				1		1	2			1													6	7	16%
07:00	3							1	1					1											6	13	30%
08:00	1	2				1					1														5	14	32%
09:00	4	10	4	1		1			3				1												24	37	84%
10:00	4	6		1	2	1																			14	45	102%
11:00	3	5	1	1	1		1					1													13	43	98%
12:00	2	3		1	1	1		1																	9	38	86%
13:00	4	5	1	1																					11	41	93%
14:00	6	1	1	2						1															11	41	93%
15:00	2	1				1																			4	27	61%
16:00		2	1																						3	22	50%
17:00	1	3	1																						5	23	52%
18:00	1	2	1			1																			5	17	39%
19:00	2	1																							3	14	32%
20:00																									0	8	18%
21:00																									0	4	9%
22:00																									0	3	7%
23:00																									0	2	5%

Client	SUTHERLAND HOSPITAL PARKING SURVEY REPORT
Location	Car Park 5
Description	TITLE OF PARKING SURVEY

Date	Thursday, 07 November 2019
Site	Car Park 5
Total Parking Spaces	562

Peak demand	490
Peak Demand %	87%
Ave Duration of Stay(h:mm)	6:47
Total Vehicles	691

Total	34	105	49	38	22	27	28	35	210	93	27	11	11	0	1	0	0	0	0	0	0	0	0	0			
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	0:00	Total	Accumulation	% Capacity
00:00																									0	0	0%
01:00																									0	0	0%
02:00																									0	0	0%
03:00																									0	0	0%
04:00										1															1	1	0%
05:00		1							3				2												6	7	1%
06:00			1					1	37	9	1	4	8												61	68	12%
07:00	2	4	4	3	1	6	8	9	65	43	14	4	1		1										165	232	41%
08:00	2	10	2	12	13	14	10	13	68	30	5	1													180	410	73%
09:00	2	14	9	5	3	1	2	4	11	1															52	455	81%
10:00	6	12	5	1		2	5	2	1																34	473	84%
11:00	5	19	6	2	3	3	1		1		2														42	490	87%
12:00	4	8	5	3	1	1		1	4		2	2													31	482	86%
13:00	3	10	5	7			1	2	20	9	3														60	490	87%
14:00	2	9	4	2	1		1	2																	21	463	82%
15:00	1	8	4					1																	14	401	71%
16:00	1	7		2																					10	299	53%
17:00	2	1	3	1																					7	161	29%
18:00		2	1																						3	84	15%
19:00	3																								3	66	12%
20:00	1																								1	52	9%
21:00																									0	42	7%
22:00																									0	17	3%
23:00																									0	5	1%

Client	SUTHERLAND HOSPITAL PARKING SURVEY REPORT
Location	Car Park 6
Description	TITLE OF PARKING SURVEY

Date	Thursday, 07 November 2019
Site	Car Park 6
Total Parking Spaces	139

Peak demand	89
Peak Demand %	64%
Ave Duration of Stay(h:mm)	6:02
Total Vehicles	122

Total	10	14	9	13	5	16	8	5	26	11	4	0	0	0	1	0	0	0	0	0	0	0	0	0			
Time	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	0:00	Total	Accumulation	% Capacity
00:00																									0	0	0%
01:00																									0	0	0%
02:00																									0	0	0%
03:00																									0	0	0%
04:00																									0	0	0%
05:00																									0	0	0%
06:00		1	1			1	1		2	2															8	8	6%
07:00	1	6		1	2	4	1	1	11	3	2														32	40	29%
08:00		2		1	2	6	2	1	8	4	1				1										28	66	47%
09:00		1	2	2	1	3	2	2	3	1															17	76	55%
10:00	2	1	1	1		1			1																7	81	58%
11:00	1	1	2	4		1	2			1															12	89	64%
12:00		2	1	2				1			1														7	88	63%
13:00	2		1	2																					5	82	59%
14:00									1																1	68	49%
15:00	1																								1	56	40%
16:00			1																						1	36	26%
17:00	3																								3	23	17%
18:00																									0	9	6%
19:00																									0	5	4%
20:00																									0	4	3%
21:00																									0	3	2%
22:00																									0	3	2%
23:00																									0	0	0%

Appendix D: Traffic Modelling Results

MOVEMENT SUMMARY

Site: 101 [Kareena Road / Northern Access - AM 2023 - Base Case (Site Folder: Proposed right turn off Kareena Road)]

Site Category: Proposed Design 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kareena Road														
2	T1	523	0.0	551	0.0	0.142	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
3	R2	60	0.0	63	0.0	0.068	7.6	LOS A	0.3	2.2	0.59	0.70	0.59	27.2
Approach		583	0.0	614	0.0	0.142	0.8	NA	0.3	2.2	0.06	0.07	0.06	46.2
East: Northern Access														
4	L2	36	0.0	38	0.0	0.054	3.4	LOS A	0.2	1.4	0.53	0.44	0.53	27.5
Approach		36	0.0	38	0.0	0.054	3.4	LOS A	0.2	1.4	0.53	0.44	0.53	27.5
North: Kareena Road														
7	L2	50	0.0	53	0.0	0.352	4.6	LOS A	0.0	0.0	0.00	0.04	0.00	22.3
8	T1	600	0.0	632	0.0	0.352	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	48.6
Approach		650	0.0	684	0.0	0.352	0.4	NA	0.0	0.0	0.00	0.04	0.00	45.9
All Vehicles		1269	0.0	1336	0.0	0.352	0.7	NA	0.3	2.2	0.04	0.07	0.04	45.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Kareena Road / Northern Access - AM 2023 - Post Dev (Site Folder: Proposed right turn off Kareena Road)]

Site Category: Proposed Design 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kareena Road														
2	T1	523	0.0	551	0.0	0.142	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
3	R2	67	0.0	71	0.0	0.077	7.7	LOS A	0.4	2.5	0.60	0.71	0.60	27.1
Approach		590	0.0	621	0.0	0.142	0.9	NA	0.4	2.5	0.07	0.08	0.07	45.8
East: Northern Access														
4	L2	40	0.0	42	0.0	0.059	3.4	LOS A	0.2	1.6	0.54	0.45	0.54	27.5
Approach		40	0.0	42	0.0	0.059	3.4	LOS A	0.2	1.6	0.54	0.45	0.54	27.5
North: Kareena Road														
7	L2	56	0.0	59	0.0	0.356	4.6	LOS A	0.0	0.0	0.00	0.05	0.00	22.2
8	T1	600	0.0	632	0.0	0.356	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	48.5
Approach		656	0.0	691	0.0	0.356	0.4	NA	0.0	0.0	0.00	0.05	0.00	45.5
All Vehicles		1286	0.0	1354	0.0	0.356	0.7	NA	0.4	2.5	0.05	0.07	0.05	44.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Kareena Road / Northern Access - AM 2030 - Base Case (Site Folder: Proposed right turn off Kareena Road)]

Site Category: Proposed Design 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kareena Road														
2	T1	523	0.0	551	0.0	0.142	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
3	R2	60	0.0	63	0.0	0.068	7.6	LOS A	0.3	2.2	0.59	0.70	0.59	27.2
Approach		583	0.0	614	0.0	0.142	0.8	NA	0.3	2.2	0.06	0.07	0.06	46.2
East: Northern Access														
4	L2	36	0.0	38	0.0	0.054	3.4	LOS A	0.2	1.4	0.53	0.44	0.53	27.5
Approach		36	0.0	38	0.0	0.054	3.4	LOS A	0.2	1.4	0.53	0.44	0.53	27.5
North: Kareena Road														
7	L2	50	0.0	53	0.0	0.352	4.6	LOS A	0.0	0.0	0.00	0.04	0.00	22.3
8	T1	600	0.0	632	0.0	0.352	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	48.6
Approach		650	0.0	684	0.0	0.352	0.4	NA	0.0	0.0	0.00	0.04	0.00	45.9
All Vehicles		1269	0.0	1336	0.0	0.352	0.7	NA	0.3	2.2	0.04	0.07	0.04	45.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Kareena Road / Northern Access - AM 2030 - Post Dev (Site Folder: Proposed right turn off Kareena Road)]

Site Category: Proposed Design 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kareena Road														
2	T1	523	0.0	551	0.0	0.142	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
3	R2	71	0.0	75	0.0	0.081	7.8	LOS A	0.4	2.7	0.60	0.71	0.60	27.0
Approach		594	0.0	625	0.0	0.142	0.9	NA	0.4	2.7	0.07	0.09	0.07	45.6
East: Northern Access														
4	L2	42	0.0	44	0.0	0.062	3.4	LOS A	0.2	1.7	0.54	0.45	0.54	27.5
Approach		42	0.0	44	0.0	0.062	3.4	LOS A	0.2	1.7	0.54	0.45	0.54	27.5
North: Kareena Road														
7	L2	59	0.0	62	0.0	0.357	4.6	LOS A	0.0	0.0	0.00	0.05	0.00	22.2
8	T1	600	0.0	632	0.0	0.357	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	48.5
Approach		659	0.0	694	0.0	0.357	0.4	NA	0.0	0.0	0.00	0.05	0.00	45.4
All Vehicles		1295	0.0	1363	0.0	0.357	0.8	NA	0.4	2.7	0.05	0.08	0.05	44.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Kareena Road / Northern Access - PM 2023 - Base Case (Site Folder: Proposed right turn off Kareena Road)]

Site Category: Proposed Design 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kareena Road														
2	T1	490	0.0	516	0.0	0.132	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
3	R2	14	0.0	15	0.0	0.023	9.7	LOS A	0.1	0.7	0.66	0.73	0.66	25.1
Approach		504	0.0	531	0.0	0.132	0.3	NA	0.1	0.7	0.02	0.02	0.02	48.7
East: Northern Access														
4	L2	80	0.0	84	0.0	0.178	7.0	LOS A	0.7	4.6	0.69	0.69	0.69	24.0
Approach		80	0.0	84	0.0	0.178	7.0	LOS A	0.7	4.6	0.69	0.69	0.69	24.0
North: Kareena Road														
7	L2	27	0.0	28	0.0	0.480	4.6	LOS A	0.0	0.0	0.00	0.02	0.00	22.4
8	T1	860	0.0	905	0.0	0.480	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.2
Approach		887	0.0	934	0.0	0.480	0.2	NA	0.0	0.0	0.00	0.02	0.00	48.1
All Vehicles		1471	0.0	1548	0.0	0.480	0.6	NA	0.7	4.6	0.04	0.05	0.04	45.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Kareena Road / Northern Access - PM 2023 - Post Dev (Site Folder: Proposed right turn off Kareena Road)]

Site Category: Proposed Design 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kareena Road														
2	T1	490	0.0	516	0.0	0.133	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
3	R2	17	0.0	18	0.0	0.028	9.8	LOS A	0.1	0.8	0.66	0.75	0.66	25.0
Approach		507	0.0	534	0.0	0.133	0.3	NA	0.1	0.8	0.02	0.03	0.02	48.4
East: Northern Access														
4	L2	94	0.0	99	0.0	0.209	7.2	LOS A	0.8	5.6	0.70	0.71	0.72	23.8
Approach		94	0.0	99	0.0	0.209	7.2	LOS A	0.8	5.6	0.70	0.71	0.72	23.8
North: Kareena Road														
7	L2	32	0.0	34	0.0	0.482	4.6	LOS A	0.0	0.0	0.00	0.02	0.00	22.4
8	T1	860	0.0	905	0.0	0.482	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.1
Approach		892	0.0	939	0.0	0.482	0.2	NA	0.0	0.0	0.00	0.02	0.00	47.8
All Vehicles		1493	0.0	1572	0.0	0.482	0.7	NA	0.8	5.6	0.05	0.07	0.05	45.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Kareena Road / Northern Access - PM 2030 - Base Case (Site Folder: Proposed right turn off Kareena Road)]

Site Category: Proposed Design 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kareena Road														
2	T1	490	0.0	516	0.0	0.132	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
3	R2	14	0.0	15	0.0	0.023	9.7	LOS A	0.1	0.7	0.66	0.73	0.66	25.1
Approach		504	0.0	531	0.0	0.132	0.3	NA	0.1	0.7	0.02	0.02	0.02	48.7
East: Northern Access														
4	L2	80	0.0	84	0.0	0.178	7.0	LOS A	0.7	4.6	0.69	0.69	0.69	24.0
Approach		80	0.0	84	0.0	0.178	7.0	LOS A	0.7	4.6	0.69	0.69	0.69	24.0
North: Kareena Road														
7	L2	27	0.0	28	0.0	0.480	4.6	LOS A	0.0	0.0	0.00	0.02	0.00	22.4
8	T1	860	0.0	905	0.0	0.480	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.2
Approach		887	0.0	934	0.0	0.480	0.2	NA	0.0	0.0	0.00	0.02	0.00	48.1
All Vehicles		1471	0.0	1548	0.0	0.480	0.6	NA	0.7	4.6	0.04	0.05	0.04	45.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Kareena Road / Northern Access - PM 2030 - Post Dev (Site Folder: Proposed right turn off Kareena Road)]

Site Category: Proposed Design 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kareena Road														
2	T1	490	0.0	516	0.0	0.133	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
3	R2	18	0.0	19	0.0	0.029	9.8	LOS A	0.1	0.9	0.66	0.75	0.66	24.9
Approach		508	0.0	535	0.0	0.133	0.4	NA	0.1	0.9	0.02	0.03	0.02	48.4
East: Northern Access														
4	L2	101	0.0	106	0.0	0.225	7.4	LOS A	0.9	6.2	0.70	0.73	0.74	23.7
Approach		101	0.0	106	0.0	0.225	7.4	LOS A	0.9	6.2	0.70	0.73	0.74	23.7
North: Kareena Road														
7	L2	34	0.0	36	0.0	0.484	4.6	LOS A	0.0	0.0	0.00	0.02	0.00	22.4
8	T1	860	0.0	905	0.0	0.484	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.1
Approach		894	0.0	941	0.0	0.484	0.2	NA	0.0	0.0	0.00	0.02	0.00	47.7
All Vehicles		1503	0.0	1582	0.0	0.484	0.7	NA	0.9	6.2	0.06	0.07	0.06	45.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2 [Kareena Road / Southern Access - AM 2020 - Base Case (Site Folder: Roundabout at Kareena Road)]

Kareena Road/ Southern Access
Site Category: Existing Conditions
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kareena Road														
2	T1	442	5	465	1.1	0.431	4.0	LOS A	3.1	21.6	0.26	0.47	0.26	39.9
3	R2	113	1	119	0.9	0.431	7.3	LOS A	3.1	21.6	0.26	0.47	0.26	39.7
3u	U	7	0	7	0.0	0.431	10.0	LOS A	3.1	21.6	0.26	0.47	0.26	50.1
Approach		562	6	592	1.1	0.431	4.8	LOS A	3.1	21.6	0.26	0.47	0.26	40.0
East: Southern Access														
4	L2	29	0	31	0.0	0.070	2.1	LOS A	0.4	2.9	0.52	0.39	0.52	31.6
6	R2	32	1	34	3.1	0.070	2.9	LOS A	0.4	2.9	0.52	0.39	0.52	26.5
6u	U	1	0	1	0.0	0.070	11.6	LOS A	0.4	2.9	0.52	0.39	0.52	28.3
Approach		62	1	65	1.6	0.070	2.7	LOS A	0.4	2.9	0.52	0.39	0.52	29.2
North: Kareena Road														
7	L2	114	0	120	0.0	0.392	4.6	LOS A	2.5	17.7	0.33	0.49	0.33	34.1
8	T1	313	9	329	2.9	0.392	4.5	LOS A	2.5	17.7	0.33	0.49	0.33	45.7
9u	U	29	0	31	0.0	0.392	10.4	LOS A	2.5	17.7	0.33	0.49	0.33	45.7
Approach		456	9	480	2.0	0.392	4.9	LOS A	2.5	17.7	0.33	0.49	0.33	43.0
All Vehicles		1080	16	1137	1.5	0.431	4.7	LOS A	3.1	21.6	0.30	0.48	0.30	40.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2 [Kareena Road / Southern Access - AM 2023 - Base Case (Site Folder: Roundabout at Kareena Road)]

Kareena Road/ Southern Access
Site Category: Existing Conditions
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kareena Road														
2	T1	442	5	465	1.1	0.393	4.0	LOS A	2.7	18.8	0.25	0.45	0.25	40.0
3	R2	58	1	61	1.7	0.393	7.3	LOS A	2.7	18.8	0.25	0.45	0.25	39.8
3u	U	7	0	7	0.0	0.393	10.0	LOS A	2.7	18.8	0.25	0.45	0.25	50.3
Approach		507	6	534	1.2	0.393	4.5	LOS A	2.7	18.8	0.25	0.45	0.25	40.2
East: Southern Access														
4	L2	29	0	31	0.0	0.071	2.1	LOS A	0.4	2.9	0.51	0.38	0.51	31.5
6	R2	34	1	36	2.9	0.071	2.9	LOS A	0.4	2.9	0.51	0.38	0.51	26.5
6u	U	1	0	1	0.0	0.071	11.6	LOS A	0.4	2.9	0.51	0.38	0.51	28.3
Approach		64	1	67	1.6	0.071	2.7	LOS A	0.4	2.9	0.51	0.38	0.51	29.1
North: Kareena Road														
7	L2	114	0	120	0.0	0.358	4.1	LOS A	2.2	15.9	0.23	0.46	0.23	34.5
8	T1	313	9	329	2.9	0.358	4.0	LOS A	2.2	15.9	0.23	0.46	0.23	46.0
9u	U	29	0	31	0.0	0.358	10.0	LOS A	2.2	15.9	0.23	0.46	0.23	46.3
Approach		456	9	480	2.0	0.358	4.4	LOS A	2.2	15.9	0.23	0.46	0.23	43.3
All Vehicles		1027	16	1081	1.6	0.393	4.4	LOS A	2.7	18.8	0.26	0.45	0.26	40.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2 [Kareena Road / Southern Access - AM 2023 - Post Dev (Site Folder: Roundabout at Kareena Road)]

Kareena Road/ Southern Access
Site Category: Existing Conditions
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kareena Road														
2	T1	442	5	465	1.1	0.402	4.1	LOS A	2.7	19.4	0.26	0.46	0.26	40.0
3	R2	65	1	68	1.5	0.402	7.3	LOS A	2.7	19.4	0.26	0.46	0.26	39.8
3u	U	7	0	7	0.0	0.402	10.0	LOS A	2.7	19.4	0.26	0.46	0.26	50.2
Approach		514	6	541	1.2	0.402	4.6	LOS A	2.7	19.4	0.26	0.46	0.26	40.1
East: Southern Access														
4	L2	33	0	35	0.0	0.080	2.1	LOS A	0.5	3.3	0.51	0.39	0.51	31.5
6	R2	38	1	40	2.6	0.080	2.9	LOS A	0.5	3.3	0.51	0.39	0.51	26.4
6u	U	1	0	1	0.0	0.080	11.6	LOS A	0.5	3.3	0.51	0.39	0.51	28.3
Approach		72	1	76	1.4	0.080	2.7	LOS A	0.5	3.3	0.51	0.39	0.51	29.1
North: Kareena Road														
7	L2	128	0	135	0.0	0.374	4.2	LOS A	2.4	16.9	0.25	0.46	0.25	34.4
8	T1	313	9	329	2.9	0.374	4.1	LOS A	2.4	16.9	0.25	0.46	0.25	46.0
9u	U	29	0	31	0.0	0.374	10.0	LOS A	2.4	16.9	0.25	0.46	0.25	46.2
Approach		470	9	495	1.9	0.374	4.5	LOS A	2.4	16.9	0.25	0.46	0.25	43.0
All Vehicles		1056	16	1112	1.5	0.402	4.4	LOS A	2.7	19.4	0.27	0.46	0.27	40.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2 [Kareena Road / Southern Access - AM 2030 - Base Case (Site Folder: Roundabout at Kareena Road)]

Kareena Road/ Southern Access
Site Category: Existing Conditions
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kareena Road														
2	T1	442	5	465	1.1	0.393	4.0	LOS A	2.7	18.8	0.25	0.45	0.25	40.0
3	R2	58	1	61	1.7	0.393	7.3	LOS A	2.7	18.8	0.25	0.45	0.25	39.8
3u	U	7	0	7	0.0	0.393	10.0	LOS A	2.7	18.8	0.25	0.45	0.25	50.3
Approach		507	6	534	1.2	0.393	4.5	LOS A	2.7	18.8	0.25	0.45	0.25	40.2
East: Southern Access														
4	L2	29	0	31	0.0	0.071	2.1	LOS A	0.4	2.9	0.51	0.38	0.51	31.5
6	R2	34	1	36	2.9	0.071	2.9	LOS A	0.4	2.9	0.51	0.38	0.51	26.5
6u	U	1	0	1	0.0	0.071	11.6	LOS A	0.4	2.9	0.51	0.38	0.51	28.3
Approach		64	1	67	1.6	0.071	2.7	LOS A	0.4	2.9	0.51	0.38	0.51	29.1
North: Kareena Road														
7	L2	114	0	120	0.0	0.358	4.1	LOS A	2.2	15.9	0.23	0.46	0.23	34.5
8	T1	313	9	329	2.9	0.358	4.0	LOS A	2.2	15.9	0.23	0.46	0.23	46.0
9u	U	29	0	31	0.0	0.358	10.0	LOS A	2.2	15.9	0.23	0.46	0.23	46.3
Approach		456	9	480	2.0	0.358	4.4	LOS A	2.2	15.9	0.23	0.46	0.23	43.3
All Vehicles		1027	16	1081	1.6	0.393	4.4	LOS A	2.7	18.8	0.26	0.45	0.26	40.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2 [Kareena Road / Southern Access - AM 2030 - Post Dev (Site Folder: Roundabout at Kareena Road)]

Kareena Road/ Southern Access
Site Category: Existing Conditions
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kareena Road														
2	T1	442	5	465	1.1	0.406	4.1	LOS A	2.8	19.7	0.27	0.46	0.27	40.0
3	R2	68	1	72	1.5	0.406	7.3	LOS A	2.8	19.7	0.27	0.46	0.27	39.8
3u	U	7	0	7	0.0	0.406	10.0	LOS A	2.8	19.7	0.27	0.46	0.27	50.2
Approach		517	6	544	1.2	0.406	4.6	LOS A	2.8	19.7	0.27	0.46	0.27	40.1
East: Southern Access														
4	L2	34	0	36	0.0	0.084	2.1	LOS A	0.5	3.4	0.51	0.39	0.51	31.5
6	R2	40	1	42	2.5	0.084	2.9	LOS A	0.5	3.4	0.51	0.39	0.51	26.4
6u	U	1	0	1	0.0	0.084	11.7	LOS A	0.5	3.4	0.51	0.39	0.51	28.2
Approach		75	1	79	1.3	0.084	2.7	LOS A	0.5	3.4	0.51	0.39	0.51	29.1
North: Kareena Road														
7	L2	135	0	142	0.0	0.381	4.2	LOS A	2.4	17.4	0.26	0.47	0.26	34.4
8	T1	313	9	329	2.9	0.381	4.1	LOS A	2.4	17.4	0.26	0.47	0.26	45.9
9u	U	29	0	31	0.0	0.381	10.1	LOS A	2.4	17.4	0.26	0.47	0.26	46.2
Approach		477	9	502	1.9	0.381	4.5	LOS A	2.4	17.4	0.26	0.47	0.26	42.9
All Vehicles		1069	16	1125	1.5	0.406	4.4	LOS A	2.8	19.7	0.28	0.46	0.28	40.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2 [Kareena Road / Southern Access - PM 2020 - Base Case (Site Folder: Roundabout at Kareena Road)]

Kareena Road / Southern Access
Site Category: Existing Conditions
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kareena Road														
2	T1	274	4	288	1.5	0.305	4.7	LOS A	1.9	13.8	0.42	0.53	0.42	39.6
3	R2	29	1	31	3.4	0.305	8.0	LOS A	1.9	13.8	0.42	0.53	0.42	39.4
3u	U	13	1	14	7.7	0.305	10.9	LOS A	1.9	13.8	0.42	0.53	0.42	49.5
Approach		316	6	333	1.9	0.305	5.3	LOS A	1.9	13.8	0.42	0.53	0.42	40.0
East: Southern Access														
4	L2	112	1	118	0.9	0.425	10.8	LOS A	4.0	28.6	1.00	0.86	1.00	28.6
6	R2	126	1	133	0.8	0.425	11.6	LOS A	4.0	28.6	1.00	0.86	1.00	23.3
6u	U	2	1	2	50.0	0.425	23.5	LOS B	4.0	28.6	1.00	0.86	1.00	22.5
Approach		240	3	253	1.3	0.425	11.4	LOS A	4.0	28.6	1.00	0.86	1.00	26.1
North: Kareena Road														
7	L2	20	1	21	5.0	0.628	4.2	LOS A	6.8	47.9	0.28	0.43	0.28	34.3
8	T1	814	8	857	1.0	0.628	4.0	LOS A	6.8	47.9	0.28	0.43	0.28	45.9
9u	U	38	1	40	2.6	0.628	10.0	LOS A	6.8	47.9	0.28	0.43	0.28	45.6
Approach		872	10	918	1.1	0.628	4.3	LOS A	6.8	47.9	0.28	0.43	0.28	45.6
All Vehicles		1428	19	1503	1.3	0.628	5.7	LOS A	6.8	47.9	0.43	0.52	0.43	39.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2 [Kareena Road / Southern Access - PM 2023 - Base Case (Site Folder: Roundabout at Kareena Road)]

Kareena Road / Southern Access
Site Category: Existing Conditions
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kareena Road														
2	T1	274	4	288	1.5	0.294	4.8	LOS A	1.8	13.1	0.42	0.53	0.42	39.7
3	R2	14	1	15	7.1	0.294	8.1	LOS A	1.8	13.1	0.42	0.53	0.42	39.5
3u	U	13	1	14	7.7	0.294	10.9	LOS A	1.8	13.1	0.42	0.53	0.42	49.6
Approach		301	6	317	2.0	0.294	5.2	LOS A	1.8	13.1	0.42	0.53	0.42	40.1
East: Southern Access														
4	L2	110	1	116	0.9	0.417	11.2	LOS A	4.1	28.8	1.00	0.85	1.00	28.5
6	R2	130	1	137	0.8	0.417	12.0	LOS A	4.1	28.8	1.00	0.85	1.00	23.2
6u	U	2	1	2	50.0	0.417	23.8	LOS B	4.1	28.8	1.00	0.85	1.00	22.4
Approach		242	3	255	1.2	0.417	11.7	LOS A	4.1	28.8	1.00	0.85	1.00	25.9
North: Kareena Road														
7	L2	24	1	25	4.2	0.608	4.0	LOS A	6.4	45.2	0.21	0.42	0.21	34.5
8	T1	814	8	857	1.0	0.608	3.9	LOS A	6.4	45.2	0.21	0.42	0.21	46.1
9u	U	38	1	40	2.6	0.608	9.9	LOS A	6.4	45.2	0.21	0.42	0.21	46.0
Approach		876	10	922	1.1	0.608	4.1	LOS A	6.4	45.2	0.21	0.42	0.21	45.8
All Vehicles		1419	19	1494	1.3	0.608	5.7	LOS A	6.4	45.2	0.39	0.51	0.39	40.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2 [Kareena Road / Southern Access - PM 2023 - Post Dev (Site Folder: Roundabout at Kareena Road)]

Kareena Road / Southern Access
Site Category: Existing Conditions
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kareena Road														
2	T1	274	4	288	1.5	0.306	4.9	LOS A	1.9	13.7	0.45	0.55	0.45	39.6
3	R2	16	1	17	6.3	0.306	8.3	LOS A	1.9	13.7	0.45	0.55	0.45	39.4
3u	U	13	1	14	7.7	0.306	11.1	LOS A	1.9	13.7	0.45	0.55	0.45	49.5
Approach		303	6	319	2.0	0.306	5.4	LOS A	1.9	13.7	0.45	0.55	0.45	40.0
East: Southern Access														
4	L2	130	1	137	0.8	0.493	13.2	LOS A	5.4	38.0	1.00	0.96	1.10	27.9
6	R2	153	1	161	0.7	0.493	14.0	LOS A	5.4	38.0	1.00	0.96	1.10	22.6
6u	U	2	1	2	50.0	0.493	25.9	LOS B	5.4	38.0	1.00	0.96	1.10	21.9
Approach		285	3	300	1.1	0.493	13.7	LOS A	5.4	38.0	1.00	0.96	1.10	25.3
North: Kareena Road														
7	L2	28	1	29	3.6	0.614	4.0	LOS A	6.6	46.5	0.23	0.42	0.23	34.5
8	T1	814	8	857	1.0	0.614	3.9	LOS A	6.6	46.5	0.23	0.42	0.23	46.1
9u	U	38	1	40	2.6	0.614	9.9	LOS A	6.6	46.5	0.23	0.42	0.23	45.9
Approach		880	10	926	1.1	0.614	4.2	LOS A	6.6	46.5	0.23	0.42	0.23	45.7
All Vehicles		1468	19	1545	1.3	0.614	6.3	LOS A	6.6	46.5	0.42	0.55	0.44	39.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2 [Kareena Road / Southern Access - PM 2030 - Base Case (Site Folder: Roundabout at Kareena Road)]

Kareena Road / Southern Access
Site Category: Existing Conditions
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kareena Road														
2	T1	274	4	288	1.5	0.294	4.8	LOS A	1.8	13.1	0.42	0.53	0.42	39.7
3	R2	14	1	15	7.1	0.294	8.1	LOS A	1.8	13.1	0.42	0.53	0.42	39.5
3u	U	13	1	14	7.7	0.294	10.9	LOS A	1.8	13.1	0.42	0.53	0.42	49.6
Approach		301	6	317	2.0	0.294	5.2	LOS A	1.8	13.1	0.42	0.53	0.42	40.1
East: Southern Access														
4	L2	110	1	116	0.9	0.417	11.2	LOS A	4.1	28.8	1.00	0.85	1.00	28.5
6	R2	130	1	137	0.8	0.417	12.0	LOS A	4.1	28.8	1.00	0.85	1.00	23.2
6u	U	2	1	2	50.0	0.417	23.8	LOS B	4.1	28.8	1.00	0.85	1.00	22.4
Approach		242	3	255	1.2	0.417	11.7	LOS A	4.1	28.8	1.00	0.85	1.00	25.9
North: Kareena Road														
7	L2	24	1	25	4.2	0.608	4.0	LOS A	6.4	45.2	0.21	0.42	0.21	34.5
8	T1	814	8	857	1.0	0.608	3.9	LOS A	6.4	45.2	0.21	0.42	0.21	46.1
9u	U	38	1	40	2.6	0.608	9.9	LOS A	6.4	45.2	0.21	0.42	0.21	46.0
Approach		876	10	922	1.1	0.608	4.1	LOS A	6.4	45.2	0.21	0.42	0.21	45.8
All Vehicles		1419	19	1494	1.3	0.608	5.7	LOS A	6.4	45.2	0.39	0.51	0.39	40.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2 [Kareena Road / Southern Access - PM 2030 - Post Dev (Site Folder: Roundabout at Kareena Road)]

Kareena Road / Southern Access
Site Category: Existing Conditions
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kareena Road														
2	T1	274	4	288	1.5	0.313	5.0	LOS A	2.0	14.0	0.47	0.56	0.47	39.5
3	R2	18	1	19	5.6	0.313	8.4	LOS A	2.0	14.0	0.47	0.56	0.47	39.3
3u	U	13	1	14	7.7	0.313	11.2	LOS A	2.0	14.0	0.47	0.56	0.47	49.4
Approach		305	6	321	2.0	0.313	5.5	LOS A	2.0	14.0	0.47	0.56	0.47	40.0
East: Southern Access														
4	L2	139	1	146	0.7	0.529	15.0	LOS B	6.3	44.6	1.00	1.06	1.19	27.4
6	R2	164	1	173	0.6	0.529	15.8	LOS B	6.3	44.6	1.00	1.06	1.19	22.1
6u	U	2	1	2	50.0	0.529	27.8	LOS B	6.3	44.6	1.00	1.06	1.19	21.5
Approach		305	3	321	1.0	0.529	15.5	LOS B	6.3	44.6	1.00	1.06	1.19	24.8
North: Kareena Road														
7	L2	30	1	32	3.3	0.618	4.1	LOS A	6.7	47.4	0.24	0.42	0.24	34.5
8	T1	814	8	857	1.0	0.618	3.9	LOS A	6.7	47.4	0.24	0.42	0.24	46.0
9u	U	38	1	40	2.6	0.618	9.9	LOS A	6.7	47.4	0.24	0.42	0.24	45.8
Approach		882	10	928	1.1	0.618	4.2	LOS A	6.7	47.4	0.24	0.42	0.24	45.7
All Vehicles		1492	19	1571	1.3	0.618	6.8	LOS A	6.7	47.4	0.44	0.58	0.48	38.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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 (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 1 [Kingsway / Port Hacking Road / Kareena Road Intersection - AM 2020 - Base Case (Site Folder: Kingsway / Port Hacking Road / Kareena Road)]

Kingsway / Port Hacking Road / Kareena Road Signalised Intersection - AM
Site Category: Existing Scenario
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kareena Road														
1	L2	70	0.0	74	0.0	0.599	27.1	LOS B	9.2	64.3	0.93	0.81	0.93	24.9
1a	L1	209	0.0	220	0.0	0.599	25.3	LOS B	9.2	64.3	0.93	0.81	0.93	31.0
2	T1	123	0.0	129	0.0	0.379	47.7	LOS D	6.8	47.5	0.93	0.75	0.93	18.1
3	R2	122	0.0	128	0.0	0.795	68.0	LOS E	8.1	56.9	1.00	0.93	1.24	16.6
Approach		524	0.0	552	0.0	0.795	40.8	LOS C	9.2	64.3	0.95	0.82	1.00	22.8
East: Kingsway														
4	L2	296	0.0	312	0.0	0.534	21.0	LOS B	10.8	75.9	0.69	0.73	0.69	33.2
5	T1	497	0.0	523	0.0	* 0.534	14.9	LOS B	11.2	78.6	0.69	0.62	0.69	37.4
6a	R1	437	0.0	460	0.0	0.602	51.5	LOS D	11.9	83.4	0.93	0.80	0.93	25.7
Approach		1230	0.0	1295	0.0	0.602	29.4	LOS C	11.9	83.4	0.77	0.71	0.77	30.4
North: Kareena Road														
7	L2	22	0.0	23	0.0	0.297	51.5	LOS D	5.2	36.2	0.91	0.73	0.91	20.4
8	T1	115	0.0	121	0.0	* 0.647	51.0	LOS D	6.7	46.9	0.94	0.77	0.97	16.9
9	R2	33	0.0	35	0.0	0.647	61.7	LOS E	6.7	46.9	1.00	0.84	1.06	14.4
9b	R3	33	0.0	35	0.0	0.647	62.6	LOS E	6.7	46.9	1.00	0.84	1.06	19.5
Approach		203	0.0	214	0.0	0.647	54.7	LOS D	6.7	46.9	0.96	0.79	0.99	17.3
NorthWest: Port Hacking Road														
27b	L3	25	0.0	26	0.0	0.273	37.8	LOS C	7.2	50.6	0.78	0.75	0.78	27.3
27a	L1	467	0.0	492	0.0	0.273	35.6	LOS C	7.4	52.0	0.78	0.75	0.78	30.5
29a	R1	117	0.0	123	0.0	* 0.773	67.8	LOS E	7.7	53.7	1.00	0.88	1.20	19.4
Approach		609	0.0	641	0.0	0.773	41.9	LOS C	7.7	53.7	0.82	0.78	0.86	27.7
West: Kingsway														
10b	L3	208	0.0	219	0.0	0.704	38.0	LOS C	18.5	129.6	0.84	0.88	0.84	26.3
10	L2	208	0.0	219	0.0	* 0.704	36.9	LOS C	18.5	129.6	0.84	0.88	0.84	20.5
11	T1	371	0.0	391	0.0	0.586	33.2	LOS C	16.9	118.5	0.79	0.69	0.79	26.4
12	R2	72	0.0	76	0.0	0.490	64.9	LOS E	4.4	30.6	0.98	0.76	0.98	14.3
Approach		859	0.0	904	0.0	0.704	37.9	LOS C	18.5	129.6	0.83	0.79	0.83	23.7
All Vehicles		3425	0.0	3605	0.0	0.795	37.0	LOS C	18.5	129.6	0.83	0.76	0.85	26.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE [Ped	Dist]	Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		ped	m			sec	m	m/sec
South: Kareena Road												
P1	Full	50	53	25.8	LOS C	0.1	0.1	0.90	0.90	55.8	39.0	0.70
East: Kingsway												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	90.1	46.6	0.52
North: Kareena Road												
P3	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	81.7	35.7	0.44
NorthWest: Port Hacking Road												
P7	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	87.6	43.3	0.49
West: Kingsway												
P4	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	87.6	43.3	0.49
All Pedestrians		250	263	48.6	LOS E	0.2	0.2	0.94	0.94	80.6	41.6	0.52

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

MOVEMENT SUMMARY

Site: 1 [Kingsway / Port Hacking Road / Kareena Road Intersection - AM 2023 - Base Case (Site Folder: Kingsway / Port Hacking Road / Kareena Road)]

Kingsway / Port Hacking Road / Kareena Road Signalised Intersection - AM
Site Category: Existing Scenario
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kareena Road														
1	L2	70	0.0	74	0.0	0.599	26.9	LOS B	9.0	63.1	0.93	0.81	0.93	25.0
1a	L1	209	0.0	220	0.0	0.599	25.2	LOS B	9.0	63.1	0.93	0.81	0.93	31.1
2	T1	123	0.0	129	0.0	0.379	47.7	LOS D	6.8	47.5	0.93	0.75	0.93	18.1
3	R2	122	0.0	128	0.0	0.797	68.0	LOS E	8.1	57.0	1.00	0.93	1.24	16.6
Approach		524	0.0	552	0.0	0.797	40.7	LOS C	9.0	63.1	0.95	0.82	1.00	22.8
East: Kingsway														
4	L2	296	0.0	312	0.0	0.565	21.8	LOS B	11.8	82.3	0.71	0.74	0.71	32.7
5	T1	527	0.0	555	0.0	*0.565	15.7	LOS B	12.2	85.2	0.71	0.64	0.71	36.6
6a	R1	437	0.0	460	0.0	0.577	50.5	LOS D	11.7	82.0	0.91	0.80	0.91	26.0
Approach		1260	0.0	1326	0.0	0.577	29.2	LOS C	12.2	85.2	0.78	0.72	0.78	30.5
North: Kareena Road														
7	L2	22	0.0	23	0.0	0.296	51.5	LOS D	5.1	36.0	0.91	0.73	0.91	20.4
8	T1	115	0.0	121	0.0	*0.644	51.0	LOS D	6.7	47.0	0.94	0.77	0.97	16.9
9	R2	33	0.0	35	0.0	0.644	61.6	LOS E	6.7	47.0	1.00	0.83	1.06	14.5
9b	R3	33	0.0	35	0.0	0.644	62.5	LOS E	6.7	47.0	1.00	0.83	1.06	19.6
Approach		203	0.0	214	0.0	0.644	54.6	LOS D	6.7	47.0	0.96	0.79	0.99	17.4
NorthWest: Port Hacking Road														
27b	L3	25	0.0	26	0.0	0.282	37.2	LOS C	7.6	53.3	0.77	0.75	0.77	27.6
27a	L1	496	0.0	522	0.0	0.282	35.0	LOS C	7.8	54.6	0.77	0.75	0.77	30.8
29a	R1	117	0.0	123	0.0	*0.773	67.8	LOS E	7.7	53.7	1.00	0.88	1.20	19.4
Approach		638	0.0	672	0.0	0.773	41.1	LOS C	7.8	54.6	0.81	0.77	0.85	28.0
West: Kingsway														
10b	L3	208	0.0	219	0.0	0.720	39.1	LOS C	18.9	132.6	0.86	0.88	0.86	26.0
10	L2	208	0.0	219	0.0	*0.720	38.0	LOS C	18.9	132.6	0.86	0.88	0.86	20.2
11	T1	394	0.0	415	0.0	0.638	34.9	LOS C	18.8	131.5	0.83	0.72	0.83	25.7
12	R2	72	0.0	76	0.0	0.445	63.5	LOS E	4.3	30.1	0.97	0.76	0.97	14.5
Approach		882	0.0	928	0.0	0.720	38.9	LOS C	18.9	132.6	0.85	0.80	0.85	23.4
All Vehicles		3507	0.0	3692	0.0	0.797	37.0	LOS C	18.9	132.6	0.84	0.77	0.86	26.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE [Ped	Dist]	Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		ped	m			sec	m	m/sec
South: Kareena Road												
P1	Full	50	53	26.2	LOS C	0.1	0.1	0.90	0.90	56.2	39.0	0.69
East: Kingsway												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	90.1	46.6	0.52
North: Kareena Road												
P3	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	81.7	35.7	0.44
NorthWest: Port Hacking Road												
P7	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	87.6	43.3	0.49
West: Kingsway												
P4	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	87.6	43.3	0.49
All Pedestrians		250	263	48.7	LOS E	0.2	0.2	0.94	0.94	80.6	41.6	0.52

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

MOVEMENT SUMMARY

Site: 1 [Kingsway / Port Hacking Road / Kareena Road Intersection - AM 2023 - Post Dev (Site Folder: Kingsway / Port Hacking Road / Kareena Road)]

Kingsway / Port Hacking Road / Kareena Road Signalised Intersection - AM
Site Category: Existing Scenario
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kareena Road														
1	L2	71	0.0	75	0.0	0.606	27.0	LOS B	9.1	63.9	0.93	0.81	0.93	25.0
1a	L1	211	0.0	222	0.0	0.606	25.2	LOS B	9.1	63.9	0.93	0.81	0.93	31.0
2	T1	124	0.0	131	0.0	0.382	47.7	LOS D	6.8	47.9	0.93	0.75	0.93	18.1
3	R2	123	0.0	129	0.0	0.812	68.9	LOS E	8.3	58.0	1.00	0.95	1.27	16.5
Approach		529	0.0	557	0.0	0.812	40.9	LOS C	9.1	63.9	0.95	0.83	1.01	22.8
East: Kingsway														
4	L2	306	0.0	322	0.0	*0.590	23.3	LOS B	12.5	87.2	0.75	0.76	0.75	31.7
5	T1	527	0.0	555	0.0	0.590	17.8	LOS B	12.9	90.3	0.75	0.67	0.75	35.0
6a	R1	437	0.0	460	0.0	0.590	51.2	LOS D	12.0	84.2	0.91	0.80	0.91	25.8
Approach		1270	0.0	1337	0.0	0.590	30.6	LOS C	12.9	90.3	0.81	0.74	0.81	29.8
North: Kareena Road														
7	L2	22	0.0	23	0.0	0.301	51.5	LOS D	5.2	36.7	0.91	0.73	0.91	20.4
8	T1	119	0.0	125	0.0	*0.656	51.2	LOS D	6.9	48.2	0.95	0.77	0.97	16.8
9	R2	33	0.0	35	0.0	0.656	61.8	LOS E	6.9	48.2	1.00	0.84	1.07	14.4
9b	R3	33	0.0	35	0.0	0.656	62.7	LOS E	6.9	48.2	1.00	0.84	1.07	19.5
Approach		207	0.0	218	0.0	0.656	54.7	LOS D	6.9	48.2	0.96	0.79	1.00	17.3
NorthWest: Port Hacking Road														
27b	L3	25	0.0	26	0.0	0.282	37.2	LOS C	7.6	53.3	0.77	0.75	0.77	27.6
27a	L1	496	0.0	522	0.0	0.282	35.0	LOS C	7.8	54.6	0.77	0.75	0.77	30.8
29a	R1	121	0.0	127	0.0	*0.799	68.8	LOS E	8.0	56.1	1.00	0.90	1.24	19.3
Approach		642	0.0	676	0.0	0.799	41.5	LOS C	8.0	56.1	0.81	0.78	0.86	27.8
West: Kingsway														
10b	L3	208	0.0	219	0.0	0.720	38.9	LOS C	18.9	132.6	0.86	0.88	0.86	26.0
10	L2	208	0.0	219	0.0	*0.720	37.8	LOS C	18.9	132.6	0.86	0.88	0.86	20.2
11	T1	394	0.0	415	0.0	0.638	34.9	LOS C	18.8	131.5	0.83	0.72	0.83	25.7
12	R2	74	0.0	78	0.0	0.387	61.0	LOS E	4.3	29.9	0.95	0.76	0.95	15.0
Approach		884	0.0	931	0.0	0.720	38.7	LOS C	18.9	132.6	0.85	0.80	0.85	23.4
All Vehicles		3532	0.0	3718	0.0	0.812	37.6	LOS C	18.9	132.6	0.85	0.78	0.87	25.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE [Ped	Dist]	Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		ped	m			sec	m	m/sec
South: Kareena Road												
P1	Full	50	53	26.8	LOS C	0.1	0.1	0.90	0.90	56.8	39.0	0.69
East: Kingsway												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	90.1	46.6	0.52
North: Kareena Road												
P3	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	81.7	35.7	0.44
NorthWest: Port Hacking Road												
P7	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	87.6	43.3	0.49
West: Kingsway												
P4	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	87.6	43.3	0.49
All Pedestrians		250	263	48.8	LOS E	0.2	0.2	0.94	0.94	80.8	41.6	0.51

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

MOVEMENT SUMMARY

Site: 1 [Kingsway / Port Hacking Road / Kareena Road Intersection - AM 2030 - Base Case (Site Folder: Kingsway / Port Hacking Road / Kareena Road)]

Kingsway / Port Hacking Road / Kareena Road Signalised Intersection - AM
Site Category: Existing Scenario
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kareena Road														
1	L2	70	0.0	74	0.0	0.599	26.9	LOS B	9.0	63.1	0.93	0.81	0.93	25.0
1a	L1	209	0.0	220	0.0	0.599	25.2	LOS B	9.0	63.1	0.93	0.81	0.93	31.1
2	T1	123	0.0	129	0.0	0.379	47.7	LOS D	6.8	47.5	0.93	0.75	0.93	18.1
3	R2	122	0.0	128	0.0	0.797	68.0	LOS E	8.1	57.0	1.00	0.93	1.24	16.6
Approach		524	0.0	552	0.0	0.797	40.7	LOS C	9.0	63.1	0.95	0.82	1.00	22.8
East: Kingsway														
4	L2	296	0.0	312	0.0	*0.612	22.8	LOS B	13.2	92.5	0.75	0.75	0.75	32.3
5	T1	606	0.0	638	0.0	0.612	18.2	LOS B	13.6	95.5	0.76	0.68	0.76	34.5
6a	R1	437	0.0	460	0.0	0.612	50.9	LOS D	12.6	88.0	0.92	0.81	0.92	26.0
Approach		1339	0.0	1409	0.0	0.612	29.9	LOS C	13.6	95.5	0.81	0.74	0.81	30.0
North: Kareena Road														
7	L2	22	0.0	23	0.0	0.296	51.5	LOS D	5.1	36.0	0.91	0.73	0.91	20.4
8	T1	115	0.0	121	0.0	*0.644	51.0	LOS D	6.7	47.0	0.94	0.77	0.97	16.9
9	R2	33	0.0	35	0.0	0.644	61.6	LOS E	6.7	47.0	1.00	0.83	1.06	14.5
9b	R3	33	0.0	35	0.0	0.644	62.5	LOS E	6.7	47.0	1.00	0.83	1.06	19.6
Approach		203	0.0	214	0.0	0.644	54.6	LOS D	6.7	47.0	0.96	0.79	0.99	17.4
NorthWest: Port Hacking Road														
27b	L3	25	0.0	26	0.0	0.321	37.7	LOS C	8.8	61.8	0.78	0.76	0.78	27.4
27a	L1	569	0.0	599	0.0	0.321	35.5	LOS C	9.0	63.2	0.78	0.76	0.78	30.6
29a	R1	117	0.0	123	0.0	*0.773	67.8	LOS E	7.7	53.7	1.00	0.88	1.20	19.4
Approach		711	0.0	748	0.0	0.773	40.9	LOS C	9.0	63.2	0.82	0.78	0.85	28.1
West: Kingsway														
10b	L3	208	0.0	219	0.0	0.752	40.8	LOS C	20.7	144.9	0.88	0.90	0.89	25.4
10	L2	208	0.0	219	0.0	*0.752	39.8	LOS C	20.7	144.9	0.88	0.90	0.89	19.7
11	T1	452	0.0	476	0.0	0.752	36.3	LOS C	21.8	152.5	0.87	0.77	0.88	25.0
12	R2	72	0.0	76	0.0	0.408	62.2	LOS E	4.2	29.5	0.96	0.76	0.96	14.8
Approach		940	0.0	989	0.0	0.752	40.0	LOS C	21.8	152.5	0.88	0.83	0.89	23.0
All Vehicles		3717	0.0	3913	0.0	0.797	37.4	LOS C	21.8	152.5	0.86	0.78	0.87	25.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE [Ped	Dist]	Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		ped	m			sec	m	m/sec
South: Kareena Road												
P1	Full	50	53	26.5	LOS C	0.1	0.1	0.90	0.90	56.5	39.0	0.69
East: Kingsway												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	90.1	46.6	0.52
North: Kareena Road												
P3	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	81.7	35.7	0.44
NorthWest: Port Hacking Road												
P7	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	87.6	43.3	0.49
West: Kingsway												
P4	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	87.6	43.3	0.49
All Pedestrians		250	263	48.7	LOS E	0.2	0.2	0.94	0.94	80.7	41.6	0.52

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

MOVEMENT SUMMARY

Site: 1 [Kingsway / Port Hacking Road / Kareena Road Intersection - AM 2030 - Post Dev (Site Folder: Kingsway / Port Hacking Road / Kareena Road)]

Kingsway / Port Hacking Road / Kareena Road Signalised Intersection - AM
Site Category: Existing Scenario
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kareena Road														
1	L2	71	0.0	75	0.0	0.608	27.0	LOS B	9.2	64.1	0.93	0.81	0.93	25.0
1a	L1	212	0.0	223	0.0	0.608	25.2	LOS B	9.2	64.1	0.93	0.81	0.93	31.0
2	T1	124	0.0	131	0.0	0.382	47.7	LOS D	6.8	47.9	0.93	0.75	0.93	18.1
3	R2	123	0.0	129	0.0	0.816	69.2	LOS E	8.3	58.2	1.00	0.95	1.28	16.4
Approach		530	0.0	558	0.0	0.816	40.9	LOS C	9.2	64.1	0.95	0.83	1.01	22.8
East: Kingsway														
4	L2	311	0.0	327	0.0	*0.619	22.9	LOS B	13.4	93.9	0.75	0.76	0.75	32.1
5	T1	606	0.0	638	0.0	0.619	18.5	LOS B	13.9	97.1	0.76	0.69	0.76	34.3
6a	R1	437	0.0	460	0.0	0.619	50.8	LOS D	12.7	89.1	0.92	0.81	0.92	26.0
Approach		1354	0.0	1425	0.0	0.619	30.0	LOS C	13.9	97.1	0.81	0.74	0.81	30.0
North: Kareena Road														
7	L2	22	0.0	23	0.0	0.304	51.5	LOS D	5.3	37.0	0.91	0.73	0.91	20.4
8	T1	121	0.0	127	0.0	*0.661	51.3	LOS D	7.0	48.8	0.95	0.78	0.97	16.8
9	R2	33	0.0	35	0.0	0.661	62.0	LOS E	7.0	48.8	1.00	0.84	1.07	14.4
9b	R3	33	0.0	35	0.0	0.661	62.8	LOS E	7.0	48.8	1.00	0.84	1.07	19.5
Approach		209	0.0	220	0.0	0.661	54.8	LOS D	7.0	48.8	0.96	0.79	1.00	17.3
NorthWest: Port Hacking Road														
27b	L3	25	0.0	26	0.0	0.321	37.7	LOS C	8.8	61.8	0.78	0.76	0.78	27.4
27a	L1	569	0.0	599	0.0	0.321	35.5	LOS C	9.0	63.2	0.78	0.76	0.78	30.6
29a	R1	123	0.0	129	0.0	*0.813	69.3	LOS E	8.2	57.4	1.00	0.91	1.26	19.2
Approach		717	0.0	755	0.0	0.813	41.4	LOS C	9.0	63.2	0.82	0.79	0.87	27.9
West: Kingsway														
10b	L3	208	0.0	219	0.0	0.753	40.9	LOS C	20.8	145.5	0.88	0.90	0.89	25.4
10	L2	208	0.0	219	0.0	*0.753	39.8	LOS C	20.8	145.5	0.88	0.90	0.89	19.7
11	T1	452	0.0	476	0.0	0.753	36.3	LOS C	21.7	152.2	0.87	0.77	0.88	25.0
12	R2	76	0.0	80	0.0	0.431	62.3	LOS E	4.5	31.3	0.96	0.76	0.96	14.7
Approach		944	0.0	994	0.0	0.753	40.2	LOS C	21.7	152.2	0.88	0.83	0.89	23.0
All Vehicles		3754	0.0	3952	0.0	0.816	37.6	LOS C	21.7	152.2	0.86	0.79	0.88	25.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE [Ped	Dist]	Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		ped	m			sec	m	m/sec
South: Kareena Road												
P1	Full	50	53	26.5	LOS C	0.1	0.1	0.90	0.90	56.5	39.0	0.69
East: Kingsway												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	90.1	46.6	0.52
North: Kareena Road												
P3	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	81.7	35.7	0.44
NorthWest: Port Hacking Road												
P7	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	87.6	43.3	0.49
West: Kingsway												
P4	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	87.6	43.3	0.49
All Pedestrians		250	263	48.7	LOS E	0.2	0.2	0.94	0.94	80.7	41.6	0.52

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

MOVEMENT SUMMARY

Site: 1 [Kingsway / Port Hacking Road / Kareena Road Intersection - PM 2020 - Base Case (Site Folder: Kingsway / Port Hacking Road / Kareena Road)]

Kingsway / Port Hacking Road / Kareena Road Signalised Intersection - PM
Site Category: Existing Scenario
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kareena Road														
1	L2	74	0.0	78	0.0	0.579	25.3	LOS B	8.9	62.5	0.91	0.80	0.91	25.8
1a	L1	222	0.0	234	0.0	0.579	23.6	LOS B	8.9	62.5	0.91	0.80	0.91	31.9
2	T1	95	0.0	100	0.0	0.293	46.8	LOS D	5.1	36.0	0.91	0.72	0.91	18.3
3	R2	99	0.0	104	0.0	0.863	74.7	LOS F	6.9	48.5	1.00	0.99	1.42	15.6
Approach		490	0.0	516	0.0	0.863	38.7	LOS C	8.9	62.5	0.93	0.82	1.01	23.7
East: Kingsway														
4	L2	449	0.0	473	0.0	*0.821	26.6	LOS B	21.0	146.9	0.90	0.86	0.95	29.4
5	T1	781	0.0	822	0.0	0.821	24.1	LOS B	21.7	151.6	0.91	0.84	0.96	30.5
6a	R1	570	0.0	600	0.0	0.821	55.9	LOS D	19.8	138.7	0.99	0.93	1.09	24.6
Approach		1800	0.0	1895	0.0	0.821	34.8	LOS C	21.7	151.6	0.93	0.88	1.00	27.6
North: Kareena Road														
7	L2	40	0.0	42	0.0	0.620	54.7	LOS D	11.6	80.9	0.98	0.81	0.98	19.7
8	T1	183	0.0	193	0.0	*0.620	51.2	LOS D	11.6	80.9	0.98	0.81	0.99	16.9
9	R2	36	0.0	38	0.0	0.620	62.2	LOS E	6.0	41.8	1.00	0.82	1.04	14.2
9b	R3	36	0.0	38	0.0	0.620	63.0	LOS E	6.0	41.8	1.00	0.82	1.04	19.3
Approach		295	0.0	311	0.0	0.620	54.4	LOS D	11.6	80.9	0.99	0.81	1.00	17.3
NorthWest: Port Hacking Road														
27b	L3	15	0.0	16	0.0	0.244	33.9	LOS C	6.8	47.9	0.73	0.74	0.73	29.0
27a	L1	480	0.0	505	0.0	0.244	31.7	LOS C	7.0	48.7	0.73	0.73	0.73	32.2
29a	R1	177	0.0	186	0.0	*0.900	74.4	LOS F	12.6	87.9	1.00	1.02	1.40	18.3
Approach		672	0.0	707	0.0	0.900	43.0	LOS D	12.6	87.9	0.80	0.81	0.91	27.2
West: Kingsway														
10b	L3	214	0.0	225	0.0	0.837	50.9	LOS D	24.4	170.6	0.95	0.97	1.05	22.4
10	L2	214	0.0	225	0.0	*0.837	49.8	LOS D	24.4	170.6	0.95	0.97	1.05	16.9
11	T1	437	0.0	460	0.0	0.837	45.1	LOS D	24.5	171.8	0.93	0.88	1.02	22.0
12	R2	111	0.0	117	0.0	0.755	68.2	LOS E	7.1	50.0	1.00	0.85	1.14	13.8
Approach		976	0.0	1027	0.0	0.837	50.0	LOS D	24.5	171.8	0.95	0.92	1.04	19.9
All Vehicles		4233	0.0	4456	0.0	0.900	41.4	LOS C	24.5	171.8	0.92	0.86	1.00	24.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE [Ped	Dist]	Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		ped	m			sec	m	m/sec
South: Kareena Road												
P1	Full	50	53	26.2	LOS C	0.1	0.1	0.90	0.90	56.2	39.0	0.69
East: Kingsway												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	90.1	46.6	0.52
North: Kareena Road												
P3	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	81.7	35.7	0.44
NorthWest: Port Hacking Road												
P7	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	87.6	43.3	0.49
West: Kingsway												
P4	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	87.6	43.3	0.49
All Pedestrians		250	263	48.7	LOS E	0.2	0.2	0.94	0.94	80.6	41.6	0.52

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

MOVEMENT SUMMARY

Site: 1 [Kingsway / Port Hacking Road / Kareena Road Intersection - PM 2023 - Base Case (Site Folder: Kingsway / Port Hacking Road / Kareena Road)]

Kingsway / Port Hacking Road / Kareena Road Signalised Intersection - PM
Site Category: Existing Scenario
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kareena Road														
1	L2	74	0.0	78	0.0	0.579	25.3	LOS B	8.9	62.5	0.91	0.80	0.91	25.8
1a	L1	222	0.0	234	0.0	0.579	23.6	LOS B	8.9	62.5	0.91	0.80	0.91	31.9
2	T1	95	0.0	100	0.0	0.293	46.8	LOS D	5.1	36.0	0.91	0.72	0.91	18.3
3	R2	99	0.0	104	0.0	0.866	75.0	LOS F	6.9	48.6	1.00	0.99	1.43	15.5
Approach		490	0.0	516	0.0	0.866	38.7	LOS C	8.9	62.5	0.93	0.82	1.01	23.6
East: Kingsway														
4	L2	449	0.0	473	0.0	*0.845	28.3	LOS B	22.8	159.6	0.92	0.88	0.99	28.6
5	T1	829	0.0	873	0.0	0.845	26.1	LOS B	23.5	164.5	0.93	0.88	1.00	29.4
6a	R1	570	0.0	600	0.0	0.845	57.1	LOS E	20.9	146.1	1.00	0.95	1.13	24.3
Approach		1848	0.0	1945	0.0	0.845	36.2	LOS C	23.5	164.5	0.95	0.90	1.04	27.0
North: Kareena Road														
7	L2	40	0.0	42	0.0	0.621	54.8	LOS D	11.6	81.0	0.98	0.81	0.98	19.7
8	T1	183	0.0	193	0.0	*0.621	51.2	LOS D	11.6	81.0	0.98	0.81	0.99	16.9
9	R2	36	0.0	38	0.0	0.621	62.2	LOS E	6.0	41.7	1.00	0.82	1.04	14.2
9b	R3	36	0.0	38	0.0	0.621	63.1	LOS E	6.0	41.7	1.00	0.82	1.04	19.3
Approach		295	0.0	311	0.0	0.621	54.4	LOS D	11.6	81.0	0.99	0.81	1.00	17.3
NorthWest: Port Hacking Road														
27b	L3	15	0.0	16	0.0	0.258	34.1	LOS C	7.3	51.1	0.73	0.74	0.73	28.9
27a	L1	509	0.0	536	0.0	0.258	31.9	LOS C	7.4	51.8	0.73	0.74	0.73	32.2
29a	R1	177	0.0	186	0.0	*0.900	74.4	LOS F	12.6	87.9	1.00	1.02	1.40	18.3
Approach		701	0.0	738	0.0	0.900	42.7	LOS D	12.6	87.9	0.80	0.81	0.90	27.3
West: Kingsway														
10b	L3	214	0.0	225	0.0	0.862	54.0	LOS D	26.4	184.7	0.97	1.00	1.09	21.6
10	L2	214	0.0	225	0.0	*0.862	52.9	LOS D	26.4	184.7	0.97	1.00	1.09	16.2
11	T1	464	0.0	488	0.0	0.862	47.5	LOS D	26.4	184.7	0.94	0.92	1.07	21.2
12	R2	111	0.0	117	0.0	0.755	68.2	LOS E	7.1	50.0	1.00	0.85	1.14	13.8
Approach		1003	0.0	1056	0.0	0.862	52.3	LOS D	26.4	184.7	0.96	0.95	1.09	19.4
All Vehicles		4337	0.0	4565	0.0	0.900	42.5	LOS D	26.4	184.7	0.93	0.88	1.02	24.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE [Ped	Dist]	Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		ped	m			sec	m	m/sec
South: Kareena Road												
P1	Full	50	53	26.2	LOS C	0.1	0.1	0.90	0.90	56.2	39.0	0.69
East: Kingsway												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	90.1	46.6	0.52
North: Kareena Road												
P3	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	81.7	35.7	0.44
NorthWest: Port Hacking Road												
P7	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	87.6	43.3	0.49
West: Kingsway												
P4	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	87.6	43.3	0.49
All Pedestrians		250	263	48.7	LOS E	0.2	0.2	0.94	0.94	80.6	41.6	0.52

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

MOVEMENT SUMMARY

Site: 1 [Kingsway / Port Hacking Road / Kareena Road Intersection - PM 2023 - Post Dev (Site Folder: Kingsway / Port Hacking Road / Kareena Road)]

Kingsway / Port Hacking Road / Kareena Road Signalised Intersection - PM
Site Category: Existing Scenario
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kareena Road														
1	L2	77	0.0	81	0.0	0.605	25.5	LOS B	9.4	65.8	0.92	0.81	0.92	25.7
1a	L1	232	0.0	244	0.0	0.605	23.7	LOS B	9.4	65.8	0.92	0.81	0.92	31.8
2	T1	99	0.0	104	0.0	0.305	47.0	LOS D	5.4	37.6	0.91	0.73	0.91	18.3
3	R2	103	0.0	108	0.0	* 0.922	82.0	LOS F	7.6	53.5	1.00	1.07	1.58	14.6
Approach		511	0.0	538	0.0	0.922	40.3	LOS C	9.4	65.8	0.93	0.84	1.05	23.2
East: Kingsway														
4	L2	454	0.0	478	0.0	* 0.847	28.5	LOS C	22.9	160.6	0.92	0.89	0.99	28.5
5	T1	829	0.0	873	0.0	0.847	26.4	LOS B	23.7	165.7	0.93	0.88	1.01	29.2
6a	R1	570	0.0	600	0.0	0.847	57.3	LOS E	21.0	146.8	1.00	0.95	1.13	24.3
Approach		1853	0.0	1951	0.0	0.847	36.4	LOS C	23.7	165.7	0.95	0.90	1.04	26.9
North: Kareena Road														
7	L2	40	0.0	42	0.0	0.633	54.9	LOS D	11.8	82.7	0.98	0.81	0.98	19.6
8	T1	185	0.0	195	0.0	0.633	51.2	LOS D	11.8	82.7	0.98	0.82	0.99	16.9
9	R2	36	0.0	38	0.0	0.633	62.6	LOS E	5.9	41.2	1.00	0.83	1.06	14.1
9b	R3	36	0.0	38	0.0	0.633	63.4	LOS E	5.9	41.2	1.00	0.83	1.06	19.2
Approach		297	0.0	313	0.0	0.633	54.6	LOS D	11.8	82.7	0.99	0.82	1.01	17.2
NorthWest: Port Hacking Road														
27b	L3	15	0.0	16	0.0	0.258	34.1	LOS C	7.3	51.1	0.73	0.74	0.73	28.9
27a	L1	509	0.0	536	0.0	0.258	31.9	LOS C	7.4	51.8	0.73	0.74	0.73	32.2
29a	R1	178	0.0	187	0.0	* 0.905	75.1	LOS F	12.7	88.9	1.00	1.03	1.42	18.1
Approach		702	0.0	739	0.0	0.905	42.9	LOS D	12.7	88.9	0.80	0.81	0.91	27.2
West: Kingsway														
10b	L3	214	0.0	225	0.0	0.863	54.0	LOS D	26.4	184.8	0.97	1.00	1.09	21.6
10	L2	214	0.0	225	0.0	* 0.863	52.9	LOS D	26.4	184.8	0.97	1.00	1.09	16.2
11	T1	464	0.0	488	0.0	0.863	47.5	LOS D	26.4	184.8	0.94	0.92	1.07	21.2
12	R2	112	0.0	118	0.0	0.762	68.4	LOS E	7.2	50.5	1.00	0.85	1.14	13.8
Approach		1004	0.0	1057	0.0	0.863	52.4	LOS D	26.4	184.8	0.96	0.95	1.09	19.3
All Vehicles		4367	0.0	4597	0.0	0.922	42.8	LOS D	26.4	184.8	0.93	0.89	1.03	23.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE [Ped	Dist]	Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		ped	m			sec	m	m/sec
South: Kareena Road												
P1	Full	50	53	26.2	LOS C	0.1	0.1	0.90	0.90	56.2	39.0	0.69
East: Kingsway												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	90.1	46.6	0.52
North: Kareena Road												
P3	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	81.7	35.7	0.44
NorthWest: Port Hacking Road												
P7	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	87.6	43.3	0.49
West: Kingsway												
P4	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	87.6	43.3	0.49
All Pedestrians		250	263	48.7	LOS E	0.2	0.2	0.94	0.94	80.6	41.6	0.52

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

MOVEMENT SUMMARY

Site: 1 [Kingsway / Port Hacking Road / Kareena Road Intersection - PM 2030 - Base Case (Site Folder: Kingsway / Port Hacking Road / Kareena Road)]

Kingsway / Port Hacking Road / Kareena Road Signalised Intersection - PM
Site Category: Existing Scenario
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kareena Road														
1	L2	74	0.0	78	0.0	0.597	25.9	LOS B	9.1	63.8	0.92	0.81	0.92	25.5
1a	L1	222	0.0	234	0.0	0.597	24.1	LOS B	9.1	63.8	0.92	0.81	0.92	31.6
2	T1	95	0.0	100	0.0	0.293	46.8	LOS D	5.1	36.0	0.91	0.72	0.91	18.3
3	R2	99	0.0	104	0.0	0.866	75.0	LOS F	6.9	48.6	1.00	0.99	1.42	15.5
Approach		490	0.0	516	0.0	0.866	39.1	LOS C	9.1	63.8	0.93	0.83	1.02	23.5
East: Kingsway														
4	L2	449	0.0	473	0.0	*0.879	30.8	LOS C	26.9	188.3	0.94	0.92	1.04	27.6
5	T1	952	0.0	1002	0.0	0.879	29.0	LOS C	27.6	193.5	0.95	0.92	1.06	27.8
6a	R1	570	0.0	600	0.0	0.879	60.9	LOS E	23.2	162.6	1.00	0.99	1.18	23.4
Approach		1971	0.0	2075	0.0	0.879	38.6	LOS C	27.6	193.5	0.96	0.94	1.09	26.0
North: Kareena Road														
7	L2	40	0.0	42	0.0	0.622	54.8	LOS D	11.6	81.2	0.98	0.81	0.98	19.6
8	T1	183	0.0	193	0.0	*0.622	51.2	LOS D	11.6	81.2	0.98	0.81	0.99	16.9
9	R2	36	0.0	38	0.0	0.622	62.3	LOS E	5.9	41.5	1.00	0.82	1.05	14.2
9b	R3	36	0.0	38	0.0	0.622	63.1	LOS E	5.9	41.5	1.00	0.82	1.05	19.3
Approach		295	0.0	311	0.0	0.622	54.5	LOS D	11.6	81.2	0.99	0.81	1.00	17.3
NorthWest: Port Hacking Road														
27b	L3	15	0.0	16	0.0	0.302	35.3	LOS C	8.6	60.4	0.76	0.75	0.76	28.4
27a	L1	585	0.0	616	0.0	0.302	33.1	LOS C	8.7	61.1	0.76	0.75	0.76	31.6
29a	R1	177	0.0	186	0.0	*0.975	93.0	LOS F	14.3	100.0	1.00	1.14	1.66	15.6
Approach		777	0.0	818	0.0	0.975	46.8	LOS D	14.3	100.0	0.81	0.84	0.96	26.0
West: Kingsway														
10b	L3	214	0.0	225	0.0	0.903	60.1	LOS E	31.1	218.0	1.00	1.04	1.18	20.3
10	L2	214	0.0	225	0.0	*0.903	59.0	LOS E	31.1	218.0	1.00	1.04	1.18	15.1
11	T1	533	0.0	561	0.0	0.903	52.3	LOS D	31.1	218.0	0.96	1.00	1.15	19.8
12	R2	111	0.0	117	0.0	0.839	71.9	LOS F	7.4	52.0	1.00	0.90	1.26	13.3
Approach		1072	0.0	1128	0.0	0.903	57.2	LOS E	31.1	218.0	0.98	1.01	1.18	18.3
All Vehicles		4605	0.0	4847	0.0	0.975	45.4	LOS D	31.1	218.0	0.94	0.92	1.08	23.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE [Ped	Dist]	Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		ped	m			sec	m	m/sec
South: Kareena Road												
P1	Full	50	53	26.0	LOS C	0.1	0.1	0.90	0.90	56.0	39.0	0.70
East: Kingsway												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	90.1	46.6	0.52
North: Kareena Road												
P3	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	81.7	35.7	0.44
NorthWest: Port Hacking Road												
P7	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	87.6	43.3	0.49
West: Kingsway												
P4	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	87.6	43.3	0.49
All Pedestrians		250	263	48.6	LOS E	0.2	0.2	0.94	0.94	80.6	41.6	0.52

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

MOVEMENT SUMMARY

Site: 1 [Kingsway / Port Hacking Road / Kareena Road Intersection - PM 2030 - Post Dev (Site Folder: Kingsway / Port Hacking Road / Kareena Road)]

Kingsway / Port Hacking Road / Kareena Road Signalised Intersection - PM
Site Category: Existing Scenario
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kareena Road														
1	L2	79	0.0	83	0.0	0.637	26.2	LOS B	9.9	69.0	0.93	0.82	0.93	25.4
1a	L1	237	0.0	249	0.0	0.637	24.4	LOS B	9.9	69.0	0.93	0.82	0.93	31.4
2	T1	101	0.0	106	0.0	0.312	47.0	LOS D	5.5	38.5	0.92	0.73	0.92	18.3
3	R2	106	0.0	112	0.0	* 0.959	90.8	LOS F	8.4	58.5	1.00	1.12	1.71	13.5
Approach		523	0.0	551	0.0	0.959	42.5	LOS C	9.9	69.0	0.94	0.86	1.09	22.5
East: Kingsway														
4	L2	456	0.0	480	0.0	* 0.895	34.1	LOS C	28.4	198.6	0.96	0.94	1.09	26.1
5	T1	952	0.0	1002	0.0	0.895	32.0	LOS C	29.2	204.2	0.97	0.96	1.10	26.4
6a	R1	570	0.0	600	0.0	0.895	61.8	LOS E	23.6	165.3	1.00	1.01	1.22	23.2
Approach		1978	0.0	2082	0.0	0.895	41.1	LOS C	29.2	204.2	0.98	0.97	1.13	25.1
North: Kareena Road														
7	L2	40	0.0	42	0.0	0.641	55.0	LOS D	12.0	84.0	0.98	0.82	0.98	19.6
8	T1	186	0.0	196	0.0	0.641	51.3	LOS D	12.0	84.0	0.98	0.82	0.99	16.9
9	R2	36	0.0	38	0.0	0.641	62.9	LOS E	5.8	40.6	1.00	0.83	1.07	14.0
9b	R3	36	0.0	38	0.0	0.641	63.8	LOS E	5.8	40.6	1.00	0.83	1.07	19.1
Approach		298	0.0	314	0.0	0.641	54.7	LOS D	12.0	84.0	0.99	0.82	1.01	17.2
NorthWest: Port Hacking Road														
27b	L3	15	0.0	16	0.0	0.302	35.3	LOS C	8.6	60.4	0.76	0.75	0.76	28.4
27a	L1	585	0.0	616	0.0	0.302	33.1	LOS C	8.7	61.1	0.76	0.75	0.76	31.6
29a	R1	179	0.0	188	0.0	* 0.986	97.6	LOS F	14.9	104.0	1.00	1.16	1.70	15.1
Approach		779	0.0	820	0.0	0.986	48.0	LOS D	14.9	104.0	0.81	0.85	0.97	25.7
West: Kingsway														
10b	L3	214	0.0	225	0.0	0.904	60.4	LOS E	31.2	218.4	1.00	1.05	1.19	20.3
10	L2	214	0.0	225	0.0	* 0.904	59.3	LOS E	31.2	218.4	1.00	1.05	1.19	15.1
11	T1	533	0.0	561	0.0	0.904	52.4	LOS D	31.2	218.4	0.96	1.00	1.15	19.8
12	R2	113	0.0	119	0.0	0.769	68.6	LOS E	7.3	51.1	1.00	0.86	1.15	13.7
Approach		1074	0.0	1131	0.0	0.904	57.0	LOS E	31.2	218.4	0.98	1.00	1.17	18.3
All Vehicles		4652	0.0	4897	0.0	0.986	47.0	LOS D	31.2	218.4	0.95	0.93	1.10	22.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Kareena Road												
P1	Full	50	53	26.2	LOS C	0.1	0.1	0.90	0.90	56.2	39.0	0.69
East: Kingsway												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	90.1	46.6	0.52
North: Kareena Road												
P3	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	81.7	35.7	0.44
NorthWest: Port Hacking Road												
P7	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	87.6	43.3	0.49
West: Kingsway												
P4	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	87.6	43.3	0.49
All Pedestrians		250	263	48.7	LOS E	0.2	0.2	0.94	0.94	80.6	41.6	0.52

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